ITexpress

2019

Education without Research is Incomplete

Reminiscence

E-Health and Mobile Technologies
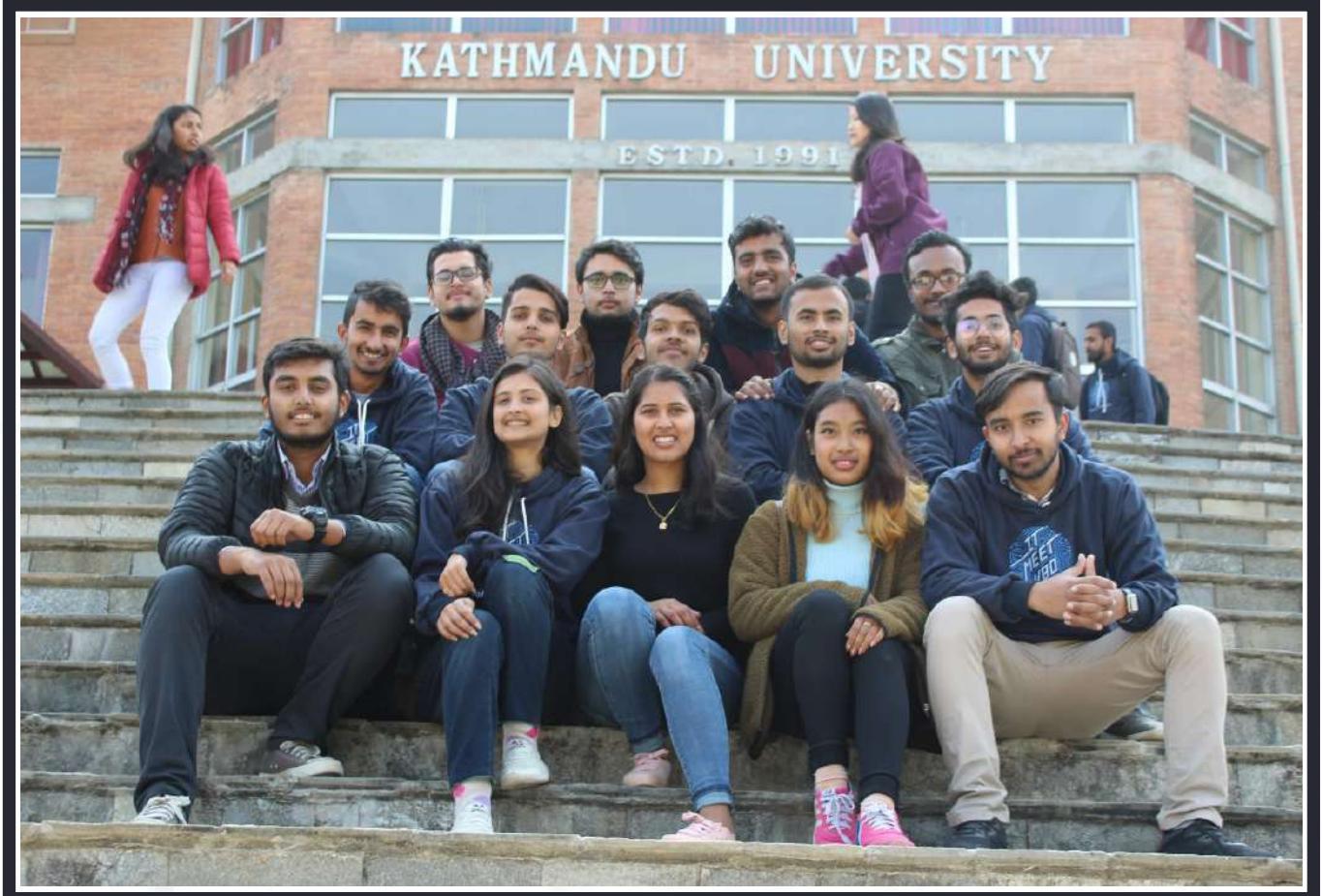
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2017-2018

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Third Row(Left to Right)
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MESSAGE FROM THE DEAN SCHOOL OF ENGINEERING

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IT MEET provides an excellent platform for the students to emphasize on the practical side of education. We are going to provide all the prerequisites required for making the IT MEET a success. I require your valubale insight in this matter.

Our university has sufficient amount of theoretical knowledge for the student to grapple on to. But, events like this boost the technical side of things. What we are lacking is the practical skills is more than fulfilled by such events.

I, as the Dean, have a vision. A vision to make knowledge the base of benefit for the community and ultimately the nation. As a hydropower engineer, I can proudly say that ample opportunities are present in our own country.

Chilime Hydropower plant is an excellent example to portray this idea. This gives the sight that Nepal could do much more in hydropower as water is a free resource and is available in abundant amount .

I expect the alumni of this prestigious institution to reach different milestones and keep the name of our university. Their success is our success. I see great potential in the student of IT. They can clearly help in the different aspects to develop the nation. I expect the students to do the project not as a course project but would alike to see them persuade them thoroughly. I would appreciate feedback from the alumni and will try my level best to eradicate the shortcomings they have faced. We have started an event in recognisition of the alumni who are contributing immensely to the community. We would like to honor them. I see a lot of potential in our country rather than the trend of foreign employment.

IT MEET is a very helpful event. I,being the person from another faculty, got a lot to learn and understand a lot just from a few events. In the era of technology, every field is connected to this field one way or other. I think it's very beneficial for an individual from any background. One could be easily be motivated from the ideas and experiences. I highly encourage everyone to visit this event.

MESSAGE FROM THE HEAD OF DEPARTMENT

Bal Krishna Bal,PhD

Associate Professor and
Head of Department of Computer Science and Engineering

Lead Researcher - Information and Language Processing Research Lab
Kathmandu, University
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Nepal

It gives me a great pleasure to write as the Head of Department of Computer Science & Engineering for IT Express, a magazine and asset of the Department which is published annually primarily by our students. The modern age demands the students to be knowledgeable not just in specific areas but in as diverse sectors as possible. This is where IT Express fills in the gap. Every year, as I read the magazine I find it ever maturing in terms of design, content and other aspects. Kudos and hats off to the editorial team for this. As students of the nation's most reputed institution, it falls on your responsibility to disseminate your ideas, ongoing works and innovations to the wider public and audience. This is because knowledge can further prosper only if it gets shared and assimilated. The IT Meet 8.0 is also already knocking our doors and in that respect I believe that IT Express can wonderfully complement it thus bringing out many interesting and must-read news and articles on technology, computer science and much more. I wish the IT Express team all the best and once again would like to thank them for their efforts to publish the magazine.

MESSAGE FROM THE
IT MEET
ADVISOR

Sushil Shrestha

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IT Meet is a platform where students get opportunity to demonstrate their skills through their projects. This event intermix the educational and commercial aspect of information technology bringing together people who are already in this field or those who are thinking of entering this field and creating a melting pot of people to get educated about IT. IT MEET aims to provide exposure to ideas, software products, hardware products of the undergraduate students in this field. It is a platform for young and aspiring tech enthusiast to get exposure to various IT companies in Nepal. Students get to know about the various IT companies which helps them identifying companies of their interest fields. This event extensively covers knowledge sharing between professors, students, professional developers and alumnis. This time with the slogan Digitize|Innovate|Lead IT Meet v8.0 is going to be held on 28 and 29th of December in the KU premises .I highly encourage student to participate and make the best of this instructive event.

IT Express being a inextricable part of IT Meet is an annual magazine of Computer science and engineering department. It is a platform where student shares their ideas, views, facts and thoughts in the field of their technological interest . There can be dynamic areas of interest for people in a field that involves technology. This magazine helps to express themselves to the wider range of audiences. I appreciate the enthusiasm and efforts the team is showing towards the magazine and event itself . I wish both the IT Express as well as IT Meet team all the best.

MESSAGE FROM THE KUCC PRESIDENT

Aashish Gyanwali

President of Kathmandu University Computer Club
Department of Computer Science and Engineering
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It has proven that technology has dominated humanity and the outflow knowledge of mankind has resulted in evolving of technology beyond the imagination of human beings.

Kathmandu University department of Computer science and Engineering has been a driving force in the development and in the utilization of diversified knowledge of students especially who are into computers in technology.

KUCC is also trying to go in flow with the help of department to provide better result and improvement in individuals.

ITMeet is an annual event organized by DoCSE with the help and support of KUCC and students. ITExpress is an annual magazine which helps students to showcase their creativity and share their activities.

Sincere gratitude to all the students who dedicated their time and efforts to bring this magazine as part of IT meet.

MEET THE FACULTY

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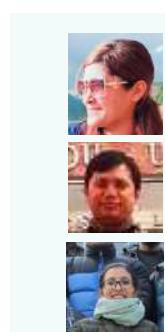
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EDITORIAL
2019

"No one can whistle a symphony. It takes a whole orchestra to play it."

The whole IT Express team harmonized together to present IT Express 2019 for all the devotees of technology. This is an outcome of individual dedication towards the group effort. It wouldn't be possible without the untiring endeavor of the whole IT Express team. However, the true essence of this magazine are the writers who contributed their remarkable piece of mastery. They are the reason behind the existence of

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Advisor

Shantanu Bhattarai
Lead Designer

Niraj Tamang
Designer

Anukul Parajuli
Designer

Aseem Regmi
Designer

this magazine.

IT Express 2019 is a continuation of what our senior had been doing in the past years. Likewise, this year we present you the new edition 2019 which is unique on its own. Let's hope you will enjoy reading the magazine. We will be more than happy to receive your feedback. Feel free to contact at itexpress2019@gmail.com.

An electronic copy of this magazine is also available at https://www.ku.edu.np/kucc/.

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Gaurab Parajuli
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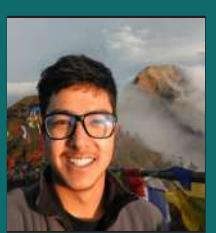
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NEWS AND EVENTS

MACHINE LEARNING WORKSHOP
September 17-18, 2018

Recognising the increasing utility of machine learning tools in the development of modern day software, the Kathmandu University Computer Club (KUCC) organized a machine learning workshop on the 17th and 18th of September, 2018 at the Department of Computer Science and Engineering (DoCSE). Instructed by Rajshree Rai, Manasi Kattel and Anurag Adhikari, it aimed to introduce handy tools such as Anaconda and Jupyter notebook and useful libraries such as Scikit learn, numpy and pandas. On the first day, after a general introduction to basic machine learning concepts, the participants were walked through the modelling and preprocessing of a real data set collected from students of KU. The workshop resumed the next day by implementing a multivariate linear regression model on the preprocessed data set to predict the GPA of students. The two day learning program received tremendous support from the program volunteers Amit Upreti and Shirshant Bajgain and enthusiastic participation from the students of Computer Science and Engineering.

JAVA WORKSHOP
October 2-3, 2018

The JAVA and OOP Workshop was conducted successfully on 2nd and 3rd October, 2018. Conducted by Sunil Prajapati (CE, 4th year), Kamlesh Kunwar (CE, 4th year) and Ayush Kumar Shah (CE, 4th year) from the Android Community, the workshop addressed the basics of Java such as functions, arrays, variables and scopes of variable as well as some more advanced concepts like OOP, advantages of OOP over structured programming, classes, objects and constructors.

MACHINE LEARNING WORKSHOP 2
November 25, 2018

With the intention of educating the participants about the utility of machine learning in image processing, KUCC organised another Machine Learning Workshop on November 25, 2018. Using tools like Google Colaboratory and useful libraries like Tensorflow, and Keras speaker Kshitiz Rimal, with help from volunteers Amit Upreti, Robin Ranabhat, Shirsak Bajgai, Sambad Bidari and Suyog Adhikari, conducted a hands on coding session on image processing consisting of over 60 participants from DoCSE and DoEEE (Department of Electrical and Electronics Engineering).

DESIGN AND ANIMATION WORKSHOP
October 1, 2018

To inspire students for creation of innovative designs, KUCC organised a Design Workshop on October 1, 2018.
Instructed by Dipesh Rai (CE, 4th Year) and Rajan Mali (CE, 4th Year), the workshop provided the participants sufficient knowledge to create their own artwork using Adobe Illustrator and animations using Adobe Animate.

WEB DEVELOPMENT WORKSHOP
December 17-18, 2018

On the 17th and 18th of December 2018, KUCC organized a web development workshop that aimed to teach both the front- and back-end of web development using JavaScript, PHP and MySQL. The workshop began by giving a brief introduction about JavaScript and its applications followed by a session of walking the participants through the creation of a paint application using web technologies. The workshop resumed by introducing PHP and MySQL database. Organized by Shirshak Bajgain and Bipul Kshetri and instructed by Dipesh Rai and Omkar Shrestha, the program received active participation from the students of DoCSE and valuable support from program volunteers Nadim Shakya and Rupesh Paudel.

ANDROID WORKSHOP
December 12-13, 2018

The Android Workshop was conducted successfully by the Android Community on 12th and 13th of December, 2018. The workshop received 17 and 12 participants on the two days. Kamlesh Kunwar (CE, 4th year) and Ayush Kumar Shah (CE, 4th year) instructed the event with help from Shoaib

Manandhar (CE, 4th year) and Pratik Poudel (CE, 4th year). The workshop started with installation of Android Studio and proceeded on to provide an overview of Android app development using Android Studio, front end and back end of Android and some starting tips and tricks. On the second day, simple layout designs using XML including linear layout and constraint layout along with backend JAVA coding (creating functions for button click, switching activity, sing intent, etc.) were demonstrated to the participants.
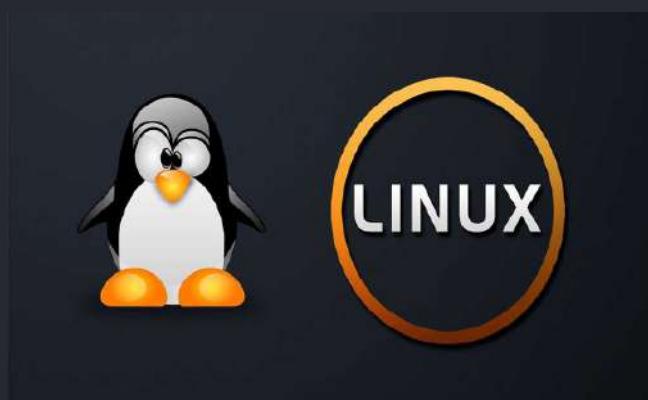
ANNUAL GENERAL MEETING FOR KUCC BOARD 2017-2018
July 9

AGM was held for KUCC board 2017-2018. Dr.Manish Pokharel, Dr.Gajendra Sharma, Mr.Manoj Shakya, Mr.Sushil Shrestha including od ther various teachers also attended the annual general meeting. The board of 2017-2018 presented about the events during their tenure. They were handed over with Token of love as a farewell gesture. The tenure of KUCC board 2018-2019 had formally started.

LINUX TALK
November 20

Like every year, Linux Talk was organized by KUOSC targeting the first year students. Discussion about history of open source software was done and preference of Linux over Windows was explained. Different commands through Ubuntu terminal were taught. The first year students were helped in installing linux based OS. Grub system was explained and they were taught to make bootable pendrives through rufus. The key speakers were Suyog Adhikari, Sambad Bidar and Prajwol Lamichhane.

STARTUP WORKSHOP
December , 2018

For the development of entrepreneurial and business management skills among engineering students, the Innovation and Startup Community organized a three day workshop on startup and business model design. On the first day of the workshop, aspiring entrepreneurs who have their own startups like Shakar Shrestha (Creatu Developers), Ojash Shrestha (Neplopers inc.), Ronesh Shrestha (Aavishkar ent.) delivered talks and entertained a fireside chat where they shared with the participants their own startup experiences. The second day of the workshop witnessed instructors from Kathmandu University School of Management (KUSOM). Prof. Dr. Rupesh Krishna Shrestha taught students about lean canvas and business models and Roshee Lamichhane Bhusal shared her thoughts on primary market research and empathy mapping. Prof. Deepesh taught the participants about prototype, its various types and how to build functional prototypes. The participants were also engaged in various interactive and fun games which made them know each other and learn about different perspectives. The final day of the workshop was a crucial one for each and every participant as they had to pitch their ideas in front of the judges and face questions regarding their business ideas. Everyone was busy preparing their slides and focusing on pitching their business ideas and securing the first place. The first place was secured by Let's Cycle , second place was secured by Nepcraft and the third place was secured by Gharelu Swad.

REACT WORKSHOP
December 17, 2018

PYTHON WORKSHOP
December 19, 2018

React Native Workshop was conducted by the React Native Community on 17th December 2018. About 10 participants attended the workshop. The workshop was mainly targeted for 2nd and 3rd year students with the basic JavaScript knowledge. The workshop was started with the formal introduction of React native, Why React native? , Why it's so popular? , And its future in the mobile application development. Then different platforms available for the React native app development were discussed. And participants were suggested to use online platform http://snack.expo.io as many participants haven't installed locally on their laptop. Basic of React native, state, props, components, style, handling touches, flexbox model, etc were discussed with demonstration. It lasts for around 2 hours and according to the feedback given by participants, it turned out to be a successful event. The event was conducted by Rupesh Poudel(React Native Community Coordinator) and Dipesh Rai(Speaker) with the help of supporting members: Sangam Pokharel, Saroj Kunwar and Ashish Subedi.

Python Workshop was held successfully by the Python community, Kathmandu University. The workshop started at 2 pm and a total of 35 participants took part in the workshop. Saroj Bikram Kunwar(Python community coordinator, CE 4th year) and Dipesh Rai (CE 4th year) instructed the workshop with the volunteering help of Ashish Subedi, Rupesh Poudel, Krishna Gaire, Sangam pokhrel, Robin Ranabhatt, Bibek KC, Bipul Bikram Thapa, Nadeem Shakya, Anish Adhikari And Anjesh Ojha all from CE 4th year along with the presence of KUCC President Mr. Ashish Gaywali. The workshop was given with focus in python version 3.7.0 basics and initiated with the installation process. Then along with the introduction, all the basics required to work on python was given with full mentoring by the volunteers. The participants were given challenging tasks and checked if they were learning what it was meant to learn from the workshop. It turned out to be very fruitful as students from the first year from different departments along with some staffs from the college took part in the competition. The event was conducted for 3 and half hours up to 5:30 pm in the evening. At last from the participant's feedback it was confirmed that they were satisfied with the workshop and got the basic knowledge to get started with Python.

COMMUNITIES UNDER KUCC AND THEIR CO-ORDINATORS

KUOSC	Innovation and Enterpreneurship Community
Suyog Adhikari	Amit Upreti
Android Community	Network Security Community
Ayush Kumar Shah	Beeshal Adhikari
Web Community	Machine Learning Community
Bipul Bikram Thapa	Robin Ranabhat
Shirshak Bajgain	Rajshree Rai
Competitive Programming	Design and Animation Community
Bishal Sarangkoti	Dipesh Rai
React Native Community	Python Community
Rupesh Poudel	Saroj Kunwar

"EDUCATION WITHOUT RESEARCH IS INCOMPLETE"

Mr. Sushil Shrestha is an Assistant Professor in Department of Computer Science and Engineering (DoCSE) at Kathmandu University, Nepal. His research areas include Online Learning, Knowledge Discovery and Data Mining, Human Computer Interaction and Knowledge Management. He is a Lead Researcher in Digital Learning Research Lab (DLR Lab). He is also a PhD scholar and has numerous experiences of participating and presenting in several national and international conferences.

The most important component that differentiates between a university and a college is "research". In university, you gradually get a clearer idea about the specialized field where your true interest is and it is only through research that a student can delve into it.

Most universities have a defined set of courses, which very rarely can be changed. However, each student has immensely varying interests with respect to the other even in the context of the same department. For example, some may be interested in computer networks, security, software engineering and AI etc. Take for instance a student is highly interested in knowledge engineering, but this student along with the various other students who may or may not be interested in the same thing will be studying the same course offered by the department. This is where research plays an important role, it is what gives you the edge in your field of interest.

To begin with research, one must first identify one's domain. This is a scenario wherein one is highly curious about a particular subset of a larger domain. Further, research gives you an insight on your domain once you begin to dig into the various domains. This helps the students involved in research to easily select and clearly describe their ambition before beginning with master's studies. Research also lets you be aware and knowledgeable about the latest emerging technology and studies that are currently making a lot of impact.

Research, due to its extensiveness, requires a team effort so there has to be some space for discussions and knowledge sharing. Hence, the concept of research labs has been prominent in foreign countries and we must also adapt such concepts in our universities. In our department we have two actively running research labs i.e., Digital Learning Research Lab (DLR Lab) led by Mr. Manoj Shakya (Assistant Professor at DoCSE) and me, and Natural Language Processing Lab (NLP Lab) led by Dr. Bal Krishna Bal (Associate Professor at DoCSE).

The DLR Lab was established in 2016 to promote research culture in the university with the following objectives: To promote online learning and e-learning pedagogy in higher education of Nepal; To develop online system to assist teachers and educators in professional teaching and learning; and empowering digital innovation in Education by using ICT. The lab has been a platform for

many undergraduate and graduate students to actively engage in several research activities.

Besides my regular job of teaching the students what the course has defined for their degree, I take pride in involving the students in numerous research activities that have even given them opportunities to present in international conferences. In addition, two journal papers have been published under my supervision. Our students have even collaborated with a group from University of Pennsylvania, USA on a research project, which was immensely difficult for both the parties to accomplish because of various obstacles and differences, but in the end they all came out with flying colors. I have been encouraging my students in my classes to work on research papers and I make sure to recommend the worthy ones for different international conferences.

The labs have worked to create an environment of learning together and research labs like ours bring like-minded people together who engage in fruitful discussions. I personally cherish the conversations I have with Manoj sir because every time we meet there seem to be fantastic ideas emerging from our dialogs.

If students want to begin research, they should follow the steps mentioned below:
1. Select the domain of your interest
2. Identify the faculty members knowledgeable about the selected domain
3. Identify other students that share the same interest
4. Consult the faculty members on how to begin
5. Take the initiative and make it happen

Research labs like the ones our department has were not in existence when I was a student in this university. We must understand that not everything will be plated to us; we have to take the initiative and create an environment that will benefit students on years to come. The DLR lab is the result of hardship and team work.

The students have restricted themselves to assignments, exams and semester projects. I notice how they lack self-discipline and willingness to work hard. The students have been following a comfortable mediocre way of life. I believe it is necessary for our students to realize that if they wish to accomplish any task they should either do it whole heartedly or not do it at all.

"In conclusion, Research is a very important part of your education as well as career and without research it is very hard in the current world to be successful. Research brings forth various opportunities as well as links to all the intellectuals who share similar interests. So it is a suggestion from my side to all the students that they indulge into research activities and make their future brighter."

Kathmandu University Digital Learning Research Lab

"KSHITIZ RIMAL ON MACHINE LEARNING AND AI"

Mr. Kshitiz Rimal

Head of Research at AID, Google Developers Expert (GDE) on ML, Intel AI Student Ambassador, City.AI Ambassador

In what instances do you see machine learning prominently impacting Nepal's context?

I think it is quiet early now to assume these things, but I am optimistic that Machine Learning can significantly impact fields of agriculture, medical sciences and natural resources. Moreover, It is substantially essential to see ML grow in the field of Natural Language Processing.

How was your experience when you first started learning the concepts of ML?

When I first started learning ML, it was something completely new. I came from programming UI/UX and software development background, hence coming from such a background it was entirely different for me, in fact very challenging as well. But on the other hand it made me look at things, like math, in a completely different way and has truly opened up a new perspective in me.

What is your dream project?

I think I would love to work on something that is related to genomics and AI and build something that can unlock new potential and drive human race forward.

What are your opinions on the repercussions of letting AI into our daily lives?

Perhaps we will become lazier day by day because AI will do all the various mundane tasks for us but I also think this will increase the value of human life and we can finally focus on things that's really important for us, more important than the mundane ones.

Do you think people will ever be able to trust AI in fields like medicine or surgery?

Sure, it will take some time but eventually, yes. There is no other way. There will be accidents and unwanted incidents but ultimately we will fix them and there will be a future, where we will trust AI more than human hands.

REMINISCENCE

Sakar Bhattarai

"Khana khane bela bhayo, khana khana aija", my mother called out . It was 8:45 PM, 5th January 2018 and like any other day, I was mindlessly scrolling through my social media's feed, needing an excuse to prolong my stay with my precious bed during the chilly winter.

As social media posts started getting stale, the last resort was my e-mail. The first email read:

Please take the coding exam so that your target company can access your skills better.

With no idea which company or which skills the mail was talking about, I pondered for a while.

Staying in my warm bed and rusting my brain over something (then) potentially useless VS Leaving my bed and having dinner with Pharsi ko tarkari.

The choice was clear.

"Mamu, ma 10 minutes dhilo auchu hai?" , I shouted and opened the link up.

Take a practice test to better understand the time required and complexity of your exercises.

No time for that bruh, I said to myself as I pressed skip. opened the link to the actual problem and started going through it.

Let's now freeze time (it's my story, I can!) right here to answer "Who the hell is this guy, and what's he writing about?"

I'm Shakar , a computer engineering graduate from Kathmandu University (2013- 2017) currently working as an application engineer for Rakuten Inc. Rakuten Inc. is Japan's biggest e-commerce platform with services ranging from E-commerce, Mobile Network, Finance Technologies, E-Groceries, Wedding industry, Dating Platform, E-Books. Bettiing platforms, Life Insurance, Travel Industry and what not . I like to think of it as the E-CORP in Mr. Robot if you get the reference.

But that's a bit boring. Rakuten is known globally as the official sponsor for FC Barcleona and of course for being the operating company behind Rakuten Viber which has it's mass popularity in South Asia.

To say that I'm privileged to be working at a company of this scale would be an understatement. Every single line of code I write every day has it's impact on millions of users, this can never stop fascinating me.

BUT that's not what this article is about.

This article is about all those moments I had during my university days that I wish I could've improved, all those things I look back to, and wish to transform. This article is to be able to get my words out there, so that you as a reader who is having a difficult time juggling assignments, reports, viva's , internals, practicals, boards and of course your sweet little romantic love life won't make the same mistakes that I ended up making.

The first thing I realized very late about my university life. The fact that college is not about learning, it's about learning "How to Learn".

I joint engineering school with high hopes, all of which , I believed would become a reality once I put in everything into what the college

had for me to offer and so I did. I graduated with a pretty decent grade, topping semesters, had a decent enough start to my career by joining Verscend Technologies, one of the leading IT companies in the nation and ultimately ending up here in Japan. However, if I had another shot at college, I would probably spend way more time learning, exploring my creativity without being bound by what the college had for me to offer. I believe I could be way more creative, diligent and knowledgeable than I am now, had I realized this during the early stages of my university life.

Living in the age of technology, the knowledge you gain today can become obsolete in a matter of days. It would be outrageous to expect the college curriculum to be synced with the global technological changes.

A simple way to demonstrate: C/C++ lessons you take on your first year. 90% of college graduates will not end up using C/C++ once they graduate. Imagine changing the college curriculum every semester and introducing a new language instead of C/C++ to keep up with the language in trend?

You get the catch. The syntax you remember for creating a pointer to a function in C can help you get an A on your GPA sheet, but you're missing out on the B-Z of the real world applications if you don't understand the part of the ice-berg underneath the sea.

The purpose of education is not for you becoming an IDE, because it's IDE's job to refer to you the syntax and semantics of a langauge. World's best software developers google the simplest of syntax every time they go out to code. Here ends my first experience: "Don't learn. Learn how to learn".

Let's take a flashback again. This is towards the end of second year during my university days where nothing seemed to make sense.

This was the stage where I would droll looking at how talented everyone around me was. My seniors were not merely developing innovative projects but deploying it and actually making an impact among the people around. My classmates too were developing amazing applications/websites that was not just glowing with designs but equally filled with utility.

I started looking into github projects of college graduates and it didn't help my ego either. A junior of mine during high school who had just joined a university in the US asked me to solve his COMP-101 programming exercise which took me an entire day to solve. And just when I thought it couldn't get any worse, my love life had hit rock bottom. (Ask me more later, I'd love to talk about this)When I look back at this moment now, I literally laugh (Nah kidding,I just breath a bit heavily).

I laugh because at that precise moment, I thought my life wasn't making sense. The then Shakar could just not see his future with computers. Everything around would bring him down.

And hence, this is my second experience I wish to share with you. We all have moments like these where nothign make sense, where it all seems to be falling apart. Luckily the moment was brief for me,but to someone out there, this might be longer, longer than you expect. The key is to remember, like Steve Jobs famously said, the dots might not connect going forward but they do connect looking backwards. 3-4 years down the road, you're going to look back and not just realize that the path was perfectly clear but also realize what you thought then actually helped shape you become the person you are today. And no matter what you think as of now, the future is always brighter than what you have in mind.Let us now un-freeze the time I froze in the beginning of the article. I did take that test, it was quite a challenging

problem that I was luckily able to solve, ended up being called for an interview in Singapore, got selected and am where I am today.

But as of now, when I look back, I don't remember the times where I attended my classes, or the times where I saw those 3.8 ~ 3.9's on my GPA sheet, neither do I remember the times where the drawing sheet was my worst nightmare.

All that comes to my mind are the amazing momos from KU Canteen, after-exam snacks at Junu, lassi and entrepreneurial tea talks at Manakamana. My memories are filled with laughter, joy, love, heartbreaks, sunbasks, night strolls, stage performances.

My eyes only see those endless pursuance my friends made on to me to bunk a class/ cancel them, those moments where I would nag all my friends for 6 months to contribute to a project but had to end up doing it all alone in the end, I miss the tiniest of moments that I didn't even know I'd ever remember.

And hence here's my final lego piece of what I have to give to you. The four years you spend at the university end up being the best moments of your lives, ones you'll often revisit but can never re-live. Laugh, cry, sing, dance, break your hearts, dream, watch your dreams get shattered, re-dream, discover others, discover yourselves, learn, teach, play, party ,study. Do all that university life has for you to offer. Enjoy your KU Life, make every second count.

E-HEALTH AND MOBILE TECHNOLOGIES

Sanjog Sigdel
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"Good health for Well Being" is one out of seventeen Sustainable Development Goal stated by the United Nations in 2015. Good Health unleashes capacity for taking a good decision. It motivates and energizes in performing every physical and mental task with ease.

Technology is a powerful medium for information flow. In order to solve all sustainable goals, literacy will be one strong solution. Therefore to achieve any goal, technology plays a strong role. We can provide a solution in form of software tools and services.
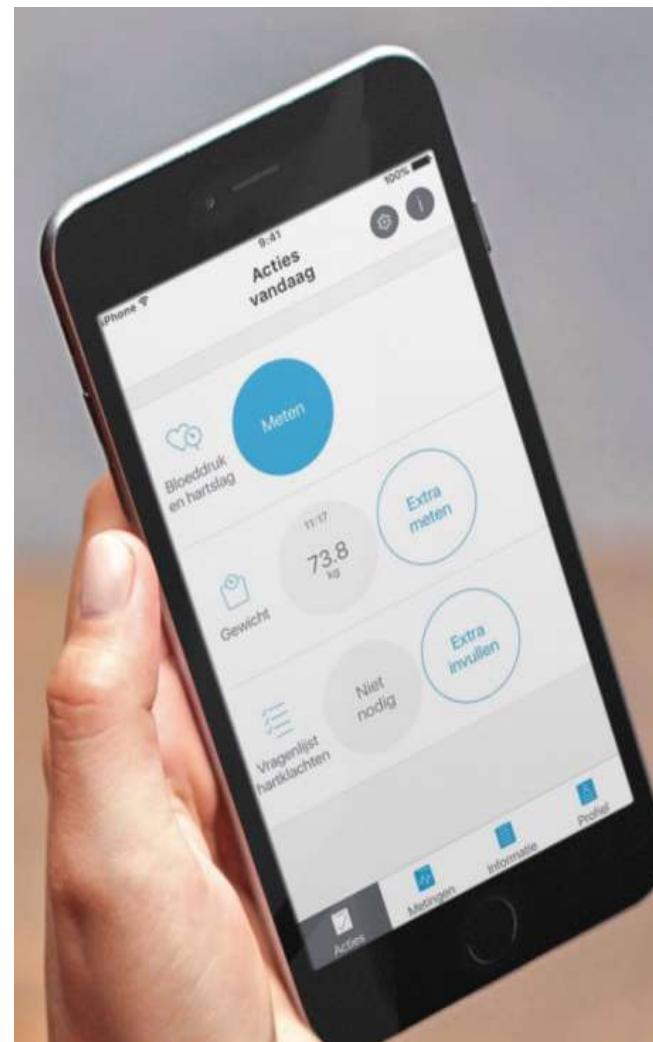
Mobile technology has been successful in replacing the use of technologies such as desktop & laptops. Internet use is widely spread due to the availability of mobile phone and smart technologies. Achieving solutions for solving any problem big or small, mobile technology will be a perfect platform.

In Health Informatics E-Health is a new term. It was quoted sometime near the 1990s. Telemedicine was in the boom at that time. But it closed a barrier that telemedicine failed to suffice. That is, telemedicine only focused on the medical solutions or treatment to patients. Use of telemedicine was only for the doctor-patient relationship. But E-Health provided intuitive solutions breaching this barrier. Some of those solutions are healthcare data sharing between doctor, patient and associated bodies for tracking medical traits, disease diagnosis results, medical diagnosis practices for similar diseases, platforms for personal doctor-patient discussion, diagnosis, alarms and notifications systems for checkup appointments, medicine intakes, injections, and laboratory checkups, etc.

Globally, different countries have implemented frameworks and platforms of E-Health Solutions. With this good results like, conversion of paper-based medical entry system to a digital platform, tracking of medical anomaly (epidemics and hazards tracking, birth and death rates tracking), management of Medical Inventory and human resource availability, alarming individuals in taking daily hygienic diets and exercises, etc has been achieved.

E-Health and mobile technologies combined together can play a significant role in achieving sustainable development goals. In global level E-Health solutions can reach every rural, deprived nooks and isle of the globe. But it will take a long time. With sufficient use of healthcare technologies and e-health, we can achieve Good Health which is one out of seventeen sustainable goals.

SMARTPHONE:
COCAINE VERSION 2.0

Ashish Pokhrel
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Drug addiction, yes we are pretty familiar with this word. This has been threatening the youths of our past generations. But call be insider, optimistic or what ,I am seeing Drug addiction slowly vanishing from its existence. But before leaving its existence it has transferred its power to a smartphone.

What? Are you insane? Yeah, I know this might be the exact question running through your mind. But let me sparkle the light upon you.

Taking drug was never an issue, but overdose was. Drug simply got you busy in inhaling it time after time which harassed your life, your families life and your friends life and even your fortune. That's why it was termed as a illegal practice.

Now coming to smartphone. I use it for 6 hrs a day. Oh Yeah! Don't get shocked I am just a average user. According to the research some people use it for more than 10 hours a day. Using drug and smartphone is the same, they both kill time, both take money, both deteriorate health and both make you practically unsociable. If I sit down and start feeling the pages for side effects of using smartphone. Believe me, I would make a book on it. According to Wikipedia, Smartphones are a class of mobile phones and of multi-purpose mobile computing devices. See the word multi-purpose over there. Yes one of its purpose is to harash your life, kill your talents, turn you into pathetic introvert and loot out the fun out of your life. Today smartphones are selling like chocolates.

. Once a week a new one is launched trapping innocent people into it. So if we use mathematics we can find the the affected patients are increasing rapidly in weekly basis. So be careful the smartphone that you use as your daily driver is not more than a pathetic alluring drug.

So, In present scenario, can you survive without smartphones for a bit, Nope! you can't. The constant involvement of brain with so called games, social platforms and other hazardous network scams are forcing you, are pulling you, are trapping you into using smartphones.

Are you already affected by this new form of drug? Find it out yourself. Can you survive a week without a smartphone? If yes, then you are fine but if not then my friend please visit IT hospital near you as fast as you can.

So be careful while using smartphone, It might be killing you from inside day by day.

THE FACEBOOK DILEMMA

Ashutosh Chapagain
CE 4th Year

I do not have the taste of great music. I find morning birds annoying. I am 21 and I have been on Facebook for 10 years. I am obliged to like songs my friends like. I am prone to favour the artists with more followers. I hate the players with more haters for no reason of my own.

IF THERE IS ONE THING NO ONE CAN SATISFY, ITS HUMAN EGO. AND IT IS THE EXACT SELLING SPOT FOR ALL SOCIAL MEDIA.

If our friends get 50 more likes on his profile picture we will show great diligence trying to turn the tables. This is a hyperloop we can never come out of. While comparing our lifestyle with the pseudo life-style portrayed by our friends on Facebook, we conclude our life to be inferior to others. According to famous psychologist Dr. Joseph Murphy, if our body is a ship our mind is the captain.

CAN THE SHIP WITHSTAND THE TIDES IF THE CAPTAIN IS NOT MOTIVATED?

Surely the creators thought connecting people would be great for mankind. I have time to watch videos on cats but I do not have time to spend time with my grandparents. Facebook is connecting with random people but they are disconnecting us with our real friends and families. I have not done a research on it, but I can say that.

I do not enjoy my food. I get jubilant if I get a good response about the food . I travel just to post photos on Instagram. I forget father's day but I remember to wish all my friends on their birthday. I am a Social Media Addict.I know I am addict. I occasionally deactivate my account. I am hopeful that one day I need to contact one of the strangers who I met at one of the events. With this hope, I cannot delete my account either.

I am in a predicament to decide on how to proceed. Should I allow facebook to indirectly affect my life or should I delete everything and become a modern era monk?
Visit https://medium.com/@itsmeashutosh43 for more

VIM VS EMACS:
THE EDITORIAL WAR

Prajwol Lamichhane
CE 3rd Year

The rivalry between the users of Vim and Emacs is commonly known as the editor war. I do not intend to say which one is better in this article but I did start with Emacs few years ago while writing a text searching script. If you are a lover of open source content, you can read ahead to decide whether Vim or Emacs suits your taste.

It is really difficult to take sides when two products are equally good at what they do. Talking about my personal experience, when I first started using Emacs, it was pretty rough. How will you know that
Ctrl + x and Ctrl + s = save
Alt + w = Copy
Ctrl + w = Cut ...
It does not make any sense. Right? At first yes, but when I was done with all the basic commands it became much easier and I used it for almost all of my programming ventures.
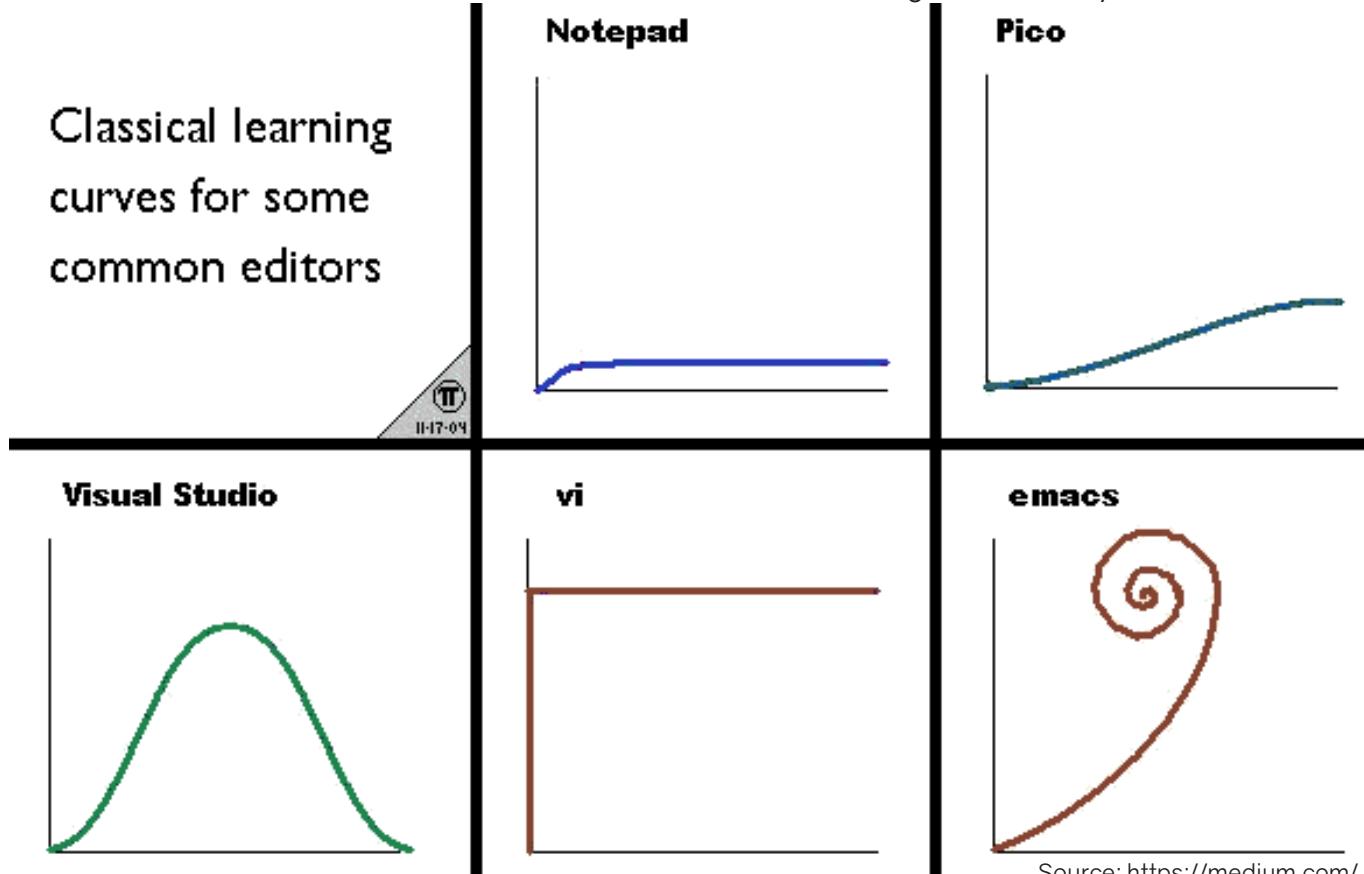
I wanted to try Vim too. I was fully onto it. I used it for a long time. I wrote many programs and scripts on Vim and after few months serious Vim usage, I reverted back to Emacs.

Let's now get down to business and talk about the specifics of the two editors.

VIM

Vim is a text editor and an acronym for "Vi Improved" because Vim was created as an extended version of the Vi editor with many additional features. It was developed using C and Vim Script in 1991. It supports both command line and graphical interface. It was basically designed to be used on slow terminals. It might be hard to learn for beginners but for very fast typing and coding movements Vim can be the better option because the cursor movements can be controlled using H, J, L, K keys, unlike Emacs

Classical learning curves for some common editors

Notepad

Pico

Visual Studio

vi

emacs

Source: https://medium.com/

VIM
usable in just about any environment.

does one thing, well.

EMACS
flexible, customizable, and packed with every feature known to man.

which uses Ctrl+B or Ctrl+F. Its keybindings, in particular, strike a nice balance between sane, nicely spaced out, logical and easy to remember and access on your average QWERTY keyboard—but remember that an editor is more than its keybindings. Moreover, Vim is lighter than Emacs and uses less memory. Vim can also use GUI libraries such as gtk, gnome, gnome2, motif, athena and neXtaw.

EMACS

Emacs is a class of feature-rich text editors, usually characterized by their extensibility. Emacs has over 1,000 editing commands. It also allows the user to combine these commands into macros to automate work. It was developed using C and Emacs Lisp in 1976. It too, like Vim, supports both command line and graphical user interface. However, Vim can be easier to learn since it has a more natural interface especially for users familiar with GUI based text editors. The productivity and editing speed on Emacs is criticized due to the fact that Ctrl + B and

Ctrl + F is used for the cursor movements which is more keys than one and comparatively takes more time for fast coders. Although, Emacs uses more memory but a single Emacs process can support several clients which in turn increases the startup speed and decreases the total memory usage narrowing the gap between Vim and Emacs. Emacs also supports a lot more customization of the editor environment. Programmers find Emacs to be far more customizable than Vim as it can be extended in elisp. Emacs uses XDisplay or gtk2 for its GUI.

In conclusion, I don't want to overcook this pessimism because there are still some very active Vim and Emacs user groups. They will have their own statement on which one is superior. It's on you to decide which one you like as both are equally good and equally true to their original philosophies. As Bertrand Russell said, "War does not determine who is right—only who is left."

NEURAL NETWORK:
# A BASIC INTRODUCTION

Shailesh Adhikarai
CE 3rd Year
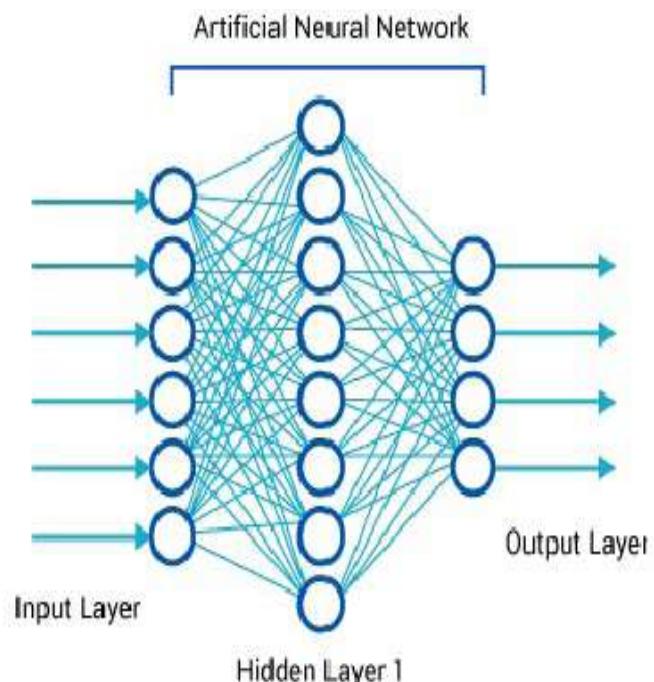
There are three different colored and shaped apples. But your brain has no trouble recognizing them as apples .This all happens because something in that crazy smart visual cortex of ours resolves these images as representing the same idea while at the same time recognizing other images as their own distinct ideas. Machine learning or a neural network use same idea moreover for same purpose. Unless you've been living under a rock I think I hardly need to motivate the relevance and importance of machine learning and neural networks to the present into the future. Artificial neural networks (ANN), a machine learning system, are computing systems vaguely inspired by the biological neural networks in brains.

So to understand the neural network let's explore our brain first. Human brain consists of neurons or nerve cells which transmit and process the information received from our senses. Many such nerve cells are arranged together in our brain to form a network of nerves. These nerves pass electrical impulses i.e. the excitation from one neuron to the other. Dendrites carry the impulse; receive from the terminal button or synapse, to the nucleus of the nerve cell which is also called as soma. Here, the electrical impulse is processed and then passed on to the axon. The axon is longer branch among the dendrites which carries the impulse from the soma to the synapse. The synapse then, passes the impulse to dendrites of the second neuron. Thus, a complex network

of neurons is created in the human brain, a supercomputer, tuned by evolution over hundreds of millions of years, and superbly adapted to understand the visual world.
It may be pretty difficult for us, engineers to grab all these biological terms. So, let me break this principle in neural network.

Artificial Neural Network

Input Layer

Hidden Layer 1

Output Layer

Input layer, Hidden layer and Output layer. Input layer deals with all the variables, pictures or sound which are feed by user or a program i.e. from our example, different types pictures of fruit And, output layer deals with displaying most proper result i.e. which one is the apple .There's also a layer in between called the hidden layers, because its values are not observed in the training set. Which for the time being, should just be a giant question mark for how on earth this process of recognizing apple is going to be handled.

All the units on these layers are called neurons. These "neuron" are computational unit that takes as input and outputs function, called the activation function. And mostly the function is the sigmoid function, which limits the output in between 0 and 1.

The way the network operates activations in one layer determine the activations of the next layer. And of course the heart of the network as an information processing mechanism comes down to exactly how those activations from one layer bring about activations in the next layer. Considering the above network a well-trained neural system, if we feed in image lighting up neurons of the input layer according to some variables. That pattern of activations causes some very specific pattern in the next layer to activate. Which causes some pattern in the one after it and finally gives some pattern in the output layer and the brightest neuron of that output layer is the network's choice so to speak for what fruit this image represents. But this process is not as simple as I speak it to you.

Before jumping into the math for how one layer influences the next or training works? Let's talk about how this layered structure behaves intelligently. What those middle layers might be doing? Well as we recognize an apple with its bumpy round top and slow decreasing body with bottom projections. In a perfect world we hope that each neuron in corresponds with one of these component. So, anytime you feed in an image of apple there's some specific neuron whose activation is going to be close to one.

Now let's discuss some math beyond this simple structure. Initially we'll assign a weight to each one of the connections between our neuron and the neurons from the first layer. These weights are just numbers then take all those activations from the first layer and compute their weighted sum according to these assigned weights. When we compute a weighted sum like this we might come out

with any number but for this network what we want is for activations to be some value between 0 & 1 so, a common function that does this is called the sigmoid function which gives every negative inputs end up close to zero and very positive inputs end up close to one. If we want the activation to be more than just 0 or 1, we can add a bias number like 10, to increase range of calculated sum.

A neuron is function which spits out number from previous neurons. So the activation of the neuron here is basically a measure of how positive the relevant weighted sum is and the weights tell you what pixel pattern this neuron in the second layer is picking up on and the bias tells you how high the weighted sum needs to be before the neuron starts getting meaningfully active. Hence same for all the neurons in the hidden layers. So, more hidden layers means more comparisons between neurons and more complex computation. This increases the efficiency of the system, but adding more hidden layers at a point just increase complexity, not efficiency.

So when we talk about learning, that's referring to is getting the computer to find a valid setting for all of these many numbers so that it'll actually solve the problem at hand. The key is finding the right set of weights for all of the connections to make the right decisions. It starts with selecting a best learning-algorithm for testing all the training data given by the user. Testing data consist of the input value with the most correct output value. Many algorithms are designed with complex mathematical calculation and explaining all these in this article is not possible. So I am going to explain about a core learning algorithm, backpropagation. In a nutshell backpropagation is algorithm to calculate all the weights and biases following a backward approach, starting from the correct output given on training set and continuing the same process for the layer before it. Again the mathematics (calculus) is dauntingly complicated and need a thorough

research in that field.

In practice it takes computers an extremely long time to add up the influence of every single training example, so here's what commonly done is to randomly shuffle your training data, and then divide it into a whole bunch of mini-batches and process those batches individually. Thus by the completion of all these process theoretically our neural network is completed and start to function as it is desired to.

The figure below is a practical neural network for the "Offline dinosaur game of Google Chrome".

If you want to know more about the neural network and the mathematics behind its computation, the internet is your pool of all the information. At the end I will like to quote Yann LeCun, computer-scientist form France "Our intelligence is what makes us human, and AI is an extension of that quality."


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MELTDOWN

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OVERVIEW

In the early 2018, the dominant player in the duopoly industry of microprocessors, Intel Inc received major backlashes after the discovery of major security flaw in their microprocessors chips built after 1995. The bug could potentially risk millions of users' privacy and attacker could steal a ton of private information from the public. The bug named as Meltdown could pose major security threat as it allowed one program to look into informations stored by another problem in the kernel. The information could include from program data to user's passwords, logs, history and sensitive information.

WHAT IS MELTDOWN?

Meltdown is a hardware vulnerability affecting x86 Intel microprocessor which breaks the most fundamental isolation of operating system and user application. Ideally, computers should separate one application from reading information passing through the kernel. But with Meltdown, that isolation is broken , so one program can read another's memory in the kernel without permission. The attack exploits the way in the Intel system handle processes where CPU cannot be certain whether an instruction will run or not, known as speculative execution. Typically, Intel will guess at the outcome of a process, run it to get ahead of the task and return to execute code when it's figured out what to do. During that process Intel didn't successfully separate low-permission applications from accessing kernel-level memory, meaning an attacker could use a malicious application to get at that private data that should've been segregated.

Google says "effectively every" Intel processor released since 1995 is vulnerable to Meltdown, regardless of the OS you're running or whether you have a desktop or laptop.

HOW DOES MELTDOWN WORK?

Meltdown consists of 3 steps:

Step 1: The content of an attacker-chosen memory location, which is inaccessible to the attacker, is loaded into a register. To load data from the main memory into a register, the data in the main memory is referenced using a virtual address. In parallel to translating a virtual address into a physical address, the CPU also checks the permission bits of the virtual address, i.e., whether this virtual address is user accessible or only accessible by the kernel. This hardware-based isolation through a permission bit is considered secure and recommended by the hardware vendors. Hence, modern operating systems always map the entire kernel into the virtual address space of every user process. As a consequence, all kernel addresses lead to a valid physical address when translating them, and the CPU can access the content of such addresses. The only difference to accessing a user space address is that the CPU raises an exception as the current permission level does not allow to access such an address. Hence, the user space cannot simply read the contents of such an address. However, Meltdown exploits the out-of-order execution of modern CPUs, which still executes instructions in the small time window between the illegal memory access and the raising of the exception.

Step 2: A transient instruction accesses a cache line based on the secret content of the register.

Step 3: The attacker uses Flush+Reload to determine the accessed cache line and hence the secret stored at the chosen memory location.

Step 4: By repeating these steps for different memory locations, the attacker can dump the kernel memory, including the entire physical memory.

WHAT CHANGES COULD HAVE AVOIDED MELTDOWN?

Since, meltdown affects millions of systems worldwide from PC to cloud computing, several companies and Intel themselves has issued patches for the mix. But since, the problem is hardware based Intel x86 architecture, patches just won't fix the problem. A change would be to put forth the architecture which load execution units with checking for loads applied earlier. Either a load from a virtual address with a kernel-only mapping is treated the same as a load from an unmapped page, or the physical page bits used for speculative execution are set to all-zero or all-one. As well as setting a fault-if/when-this-reaches-retirement bit on the micro-operation, a TLB(Translation Lookaside buffer) lookup could gate the page-address bits (to all ones) with the privilege-check. e.g. a load in user-space from any kernel page could micro-architecturally execute as a load from the very top physical page. A failed privilege check could maybe still allow the load to happen micro architecturally, but mask the result to all-zero in the load port. The Meltdown problem isn't that an unprivileged load can bring kernel data into cache, it's that the secret data load result can be used to make another load with a data-dependent address. Continuing speculative execution with a zero result for any underprivileged load that hits in the TLB wouldn't allow any data-dependent microarchitectural effects. You could even design it so a load that would fault (if it reaches retirement) doesn't complete execution at all, and no load result is forwarded to dependent instructions.

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QUALCOMM SNAPDRAGON

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QUALCOMM is an American multinational semiconductor and telecommunications equipment company that designs and markets wireless telecommunications products and services. Qualcomm is actively involved in technology related to semiconductor designing for mobile devices, tracking devices, satellite phones, Virtual Reality, wireless charging, communications etc. QUALCOMM mobile processors are designed to combine advanced features and support for worldwide network connectivity with jaw-dropping speed and unbelievable power efficiency. Wireless technology has helped us change the way life operates. Mobile phones, the very basic need of every human being of today, would not have been possible if it was not for the wireless technology. And the substantial amount of credit goes to Qualcomm, the largest company which manufactures wireless telecommunications products and services today.

Starting from 2005, Snapdragon went through a lot of series – S1, S2, S3, S4, S200, S400, S600, S800. The processor is going through S800 series as of 2016 end. S800 series already released S800, S801, S805, S808, S810, S820, S821. Most Qualcomm processors in medium to high end phone market is either a S820 or 821.

After 821, Qualcomm released 835 series which was released in early quarter of 2017. 835 series offer significant changes over 821. The new processor is 27% faster in performance, consume 40% less power and reduced size by 30%. The new chip is also equipped with Quick Charge 4.0 which can give enough power to your battery so that it can last a day with just 5-10 minute of charging.

Some of Snapdragon 821 devices are Google Pixel, HTC U Ultra, Asus Zenfone, OnePlus 3T, Xiaomi Mi 5s.

Some of Snapdragon 835 devices are Samsung Galaxy S8, OnePlus 5, Sony Xperia XZ, Pixel 2, HTC 11.

Some of Snapdragon 845 devices are Samsung Galaxy Note 9 & S9, OnePlus 6, HTC U12+.

COMPONENTS

DSP (Digital Signal Processing)

Digital signal processing (DSP) is the process of analyzing and modifying a signal to optimize or improve its efficiency or performance. It involves applying various mathematical and computational algorithms to analog and digital signals to produce a signal that's of higher quality than the original signal. DSP is primarily used to detect errors, and to filter and compress analog signals in transit. It is a type of signal processing performed through a digital signal processor or a similarly capable device that can execute DSP specific processing algorithms. Typically, DSP first converts an analog signal into a digital signal and then applies signal processing techniques and algorithms. For example, when performed on audio signals, DSP helps reduce noise and distortion. Some of the applications of DSP include audio signal processing, digital image processing, speech recognition, biomedicine and more.

ISP (Image Signal Processing)

The ISP equips a high performance image signal processing engine executes processes like noise reduction, auto exposure, auto focus, and auto white balance in high speed and high quality. It makes a chip capable to reconstruct a full color image from the incomplete color samples. Basically, there are several noise factors that degrade the quality of an image captured by camera e.g. real imperfections caused by the lens, color filter camera or the sensors. To address them, a camera must embed what is known as image signal processing in the image processor, which is also referred to as an "image signal processing (ISP) pipeline" or a "video signal processing" pipeline.

GPU (Graphics Processing Unit)

The GPU assists the CPU by handling the visuals, particularly the kind that are delivered on games and other graphically-rich applications. By offloading work to the GPU, your phone can do a much better job handling a multitude of graphics-related chores than the CPU could alone. An integrated GPU is designed so video won't stutter, photo-edits will appear more quickly, and fast-moving objects won't appear pixilated. What's more, the GPU frees up the CPU, allowing it to conserve or redirect its resources.

Neural Processing Unit

It simply means AI (Artificial Intelligence) for the smartphones. Now the smartphones are being more and more smart. Many smartphones released in the past year have included AI-focused hardware and software, from Google's Pixel phones to Apple's iPhones to Huawei's Mate line. These phones use AI in all sorts of clever ways, from imaging and photography, to power efficiency, to security. The advantage of the Qualcomm AI Engine is that the DSP never goes unused and it works in different places in the system. Although the GPU has an even better structure that can be used for AI, it is often very busy with graphic calculations in everyday use. Different mobile company uses different assistant (AI).For example: Apple uses Siri as voice activated search engine, Samsung uses Bixby and other android based company uses Google assistant as their search engine. AI features on the Pixel 2 and Pixel 2 XL are understated, but similarly focused on imaging. While several competing smartphones have introduced new hardware to complement the AI, like how several smartphones now use dual-camera setups to support Portrait Mode features, Google's devices have the same function, but are powered strictly by software.

THE APPLE ECOSYSTEM

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Do you ever wonder why people use Apple products or how Apple became the biggest tech giant when there are other, more promising manufacturers like Google, Samsung or Microsoft? It's all because of the ecosystem Apple has built.

So, what is an ecosystem in the context of technology? Simply, it's a community of interacting objects. The interaction is between the hardware and software components within the ecosystem. Apple makes a ton of devices like iPhone, Mac, iPad, Apple Watch, Apple TV, HomePod, EarPods, etc. They also make the software and proprietary technology that ties all these devices together. AirPlay, Airdrop, Continuity, iCloud create a strong interface for interaction between the Apple devices. For example, many people tend to buy an iPhone and when you buy an iPhone, you are introduced to the ecosystem where Apple encourages you to buy other Apple products because they work so well together.
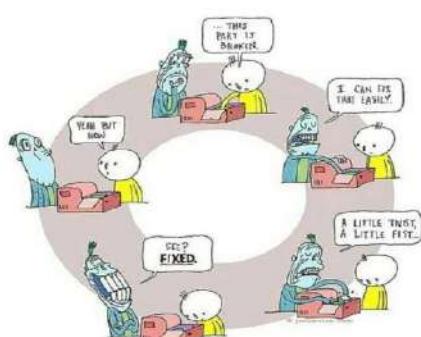
Though we have other ecosystems as well, but Apple's ecosystem seems to be the king. This unique ecosystem is probably the most successful ecosystem ever. Metaphorically, Apple has built a wall around the ecosystem inside which everything seems so beautiful that you don't even want to climb over and look what's beyond that wall. Basically, when you get a couple of Apple devices, you start falling into the ecosystem. Let's say you get an iPhone and a MacBook; you get a text message on your iPhone, you can reply through your Mac through iMessage; you are browsing the web on your iPhone, you can pick up where you left on your Mac through Safari. Through iCloud, files in one device is always on the other. You have AirDrop for peer to peer sharing between Apple devices. Ask Siri to remind something, she will keep the reminder in every Reminder app of your devices. You can call, message and even facetime with even your Apple watch.

Those who don't use Apple product seem to think of these devices to be limited, pointless or dumb in the new competitive market. For example: HomePod, Apple's smart speaker, uses Siri and Apple Music, doesn't connect to Bluetooth and also cannot connect to anything that doesn't have iOS but still exists. Why? Because for the person who uses Apple Music, has an iCloud account and has an iPhone, it is a perfect solution. All these Apple services and products are made to work the best within the ecosystem but are also designed keep you hooked up inside the ecosystem and making you to buy even more Apple products.

What about getting out of the ecosystem? Well, it is really difficult. Ask a person to give up his iPhone and go for an Android smartphone. His Facetime is gone, his Earpods become useless, no iMessage and all his other Apple devices becomes somewhat useless. The iPhone is so difficult to leave for that person. Even if a new phone comes with a better screen, better battery, better camera, a headphone jack and way cheaper, still the person would skip that phone because of the ecosystem. This is why Apple seems to be the biggest tech giant. The Apple ecosystem has not yet created impact in Nepal, but who knows the future.

The Coding Cycle

Meme corner

MY JOURNEY IN 3D ANIMATION AND GAME DEVELOPMENT

Utsav Prajapati
CE 3rd year

As someone who grew up watching cartoons and playing video games, I always dreamed of the day I would able to make cartoons and games of my own. After joining Computer Engineering, I was even more determined to make this dream a reality. So, I started trying to make games right away at the first semester. My first games were all very simple, consisted of only sprites and were unusable in an official scale. The thought of going into 3D design
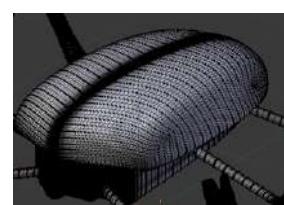
intimidated me considering I was terrible at 2D graphics as well. So, during a long boring Dashain vacation, I decided to give it a try and it worked better than I expected. Of course, the first model was not that great but it encouraged me to push on and try some more. After spending some more time on it, I was able to create more complicated models like the one below.

Theen it was time that I actually started working towards some planned projects. They didn't go very well as I was, and frankly

still am, pretty inexperienced in this field of work. The tasks were very complicated and couldn't properly be completed by me. So, I had switched to a simpler project. The product was completed with help from my friends and it soon became our first ever official game "Bugsy". I want to share our experience of making this game with you guys.

The picture at the beginning of the article was our character design for the playable character in the game, modeled and textured by me. The model was also the first thing to be made and the name of the game "Bugsy" was inspired from its bug like appearance. This game was specifically being designed for the mobile platform (mainly Android) and since the model was too high poly it had to be toned down to a lower poly version.


High Poly

Retopology

Low Poly
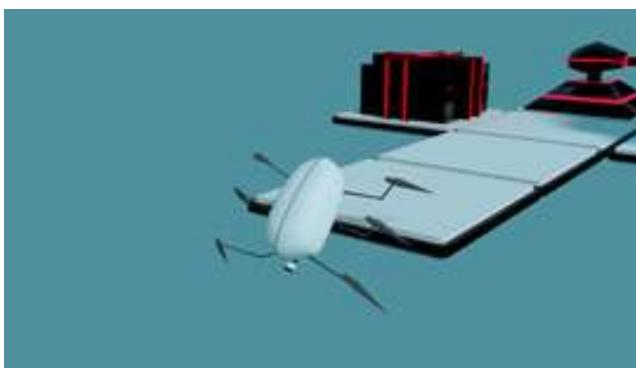
This caused us a lot of inconvenience, so, to avoid the same problem, we made other elements in lower poly like the tower beside,

modeled by Abhinna and textured by me.

The head and base for this were made separately, as we needed the head to always face the player. This was done with scripting and a little bit of help from math, mostly math. We used the angle between two points formula and rotated the head accordingly.

I feel the need to mention something here; you don't need to be very good in math if you want to get into modeling and animation. Trust me, I got F's in all my math subjects, every semester, period. Basic knowledge of coordinate geometry will help you more often than not.

The rest of the models were not that complicated. They were just textured cubes, to be honest. We released the game couple months back in the Google Play Store. While making this game, we were mainly checking if we had what it takes to properly complete a game and we did a mistake of not marketing our product properly, which made our game suffer in the number of downloads.

By now you are probably wondering what the game was all about. The game is similar concept to solve the maze (bato patta lagau) with some added elements like mines, towers and a mechanism where you can go under the maze. You need to go above and below a maze, avoiding obstacles like mines and destroying towers while not letting them destroy you instead, and collect all the blue cubes. If you like puzzle solving, classic arcade gameplay and enjoy challenges you will enjoy the game.

We are currently trying our hands in animated videos and another new game. You can find the game in the Google Play Store under the name "Bugsy". Please support us by downloading the game. It would help us greatly right now and motivate us to continue our journey in the future.

Thank you.

Bugsy
EGG HAEDS
3+
24 MB

INSTALL

100 Downloads   4.3 ★★★★★ 3 👤   Arcade   Similar

Find your way through a 2 sided maze filled with dangerous mines and enemies

READ MORE

USB C: ONE FOR ALL

Divyaswor Makai Shrestha
CE 3rd Year

The probability of successfully plugging in your USB cables to your devices is 50/50 yet it takes most of us three attempts. But such is not seen with the USB-C ports. USB-C connectors are oval-shaped, which can be used to transmit both data and power. They also have same connectors on both side of cable, which is rare with the other USB cables that are in use. Besides the simplicity of their use and accessibility, are these cables capable of overcoming its predecessor? The obvious answer is yes. Why would it be developed if it could not outperform other cables.

The protocol with the USB-C connector is USB 3.1 by default, which is 10 Gbps, which is theoretically twice as fast as the USB 3.0. Besides this, USB-C also supports Thunderbolt 3 which adds 40 Gbps bandwidth with reduced power consumption and ability to move up to 100 watts of power. A USB-C with a thunderbolt 3 may be the only cable that is required to transfer and power large amount of information. Because of this ability, USB-C has been used as the charging option for different laptops like Dell XPS 2018, ASUS Chrome Book Flip, MacBook Pro 13" and so on and most of the smartphone flagships. The speed comparison of the various USB type clearly shows the difference in the capacity of USB.

USB Standard	Data Transfer Speed	Also Known As
USB 1.1	12 Mbps	Full Speed
USB 2.0	480 Mbps	Hi Speed
USB 3.0	5 Gbps	USB 3.0 or SuperSpeed
USB 3.1 Gen 1	5 Gbps	USB 3.1 Gen 1 or SuperSpeed
USB 3.1 Gen 2	10 Gbps	SuperSpeed+ or SuperSpeed 10

USB-C's support can also be found in sending simultaneous video signals and power streams shows that it can be used to connect any type of device with HDMI or Display port . Along with this, USB-C can be used for audio transmission as companies like Google have removed the 3.5mm headphone jack to be replaced by USB-C ear buds in their flagships, which include the Pixel 2 and newly launched Pixel 3.

The features that the USB-C provides has every company in the tech-market turn their heads to it. Companies trying to make super thin and light laptops have adapted USB-C to connect to the peripheral devices and their power options as well. The smartphones mainly the flagships have started to replace the traditional mini USB with USB-C. With every device that people use making use of the USB-C it may not be too soon that the old type of connectors become obsolete. At the end of the day, the truth is that the USB-C is proving itself to be the universal bus just like its acronym says.

Professor: *doesn't give enough time to add CSS to my website*

My website:

Meme corner

COMPUTING: FOR BIOTECHNOLOGISTS

Nisha Thapa
Biotech 2017

Being a student of biotechnology, we had to study a computer related course, Bioinformatics.

The science of informatics is concerned with representation, organization, manipulation, distribution, maintenance and use of information, particularly in digital form. There is more than one interpretation of what bioinformatics is, the intersection of information and biology.

The functional aspect of bioinformatics is the information, storage and distribution of data. Intelligent design of data formats and database, creation of tools to query those database and development of user interfaces that bring together different tools to allow the user to ask complex questions about the data are all aspects of the development of bioinformatics infrastructure.

Why should Biologists use Computers?

Computers are powerful devices for understanding any system that can be described in a mathematical way. As our understanding of biological processes has grown and depend, it isn't surprising then that the discipline of computational biology , mathematics and computer science .
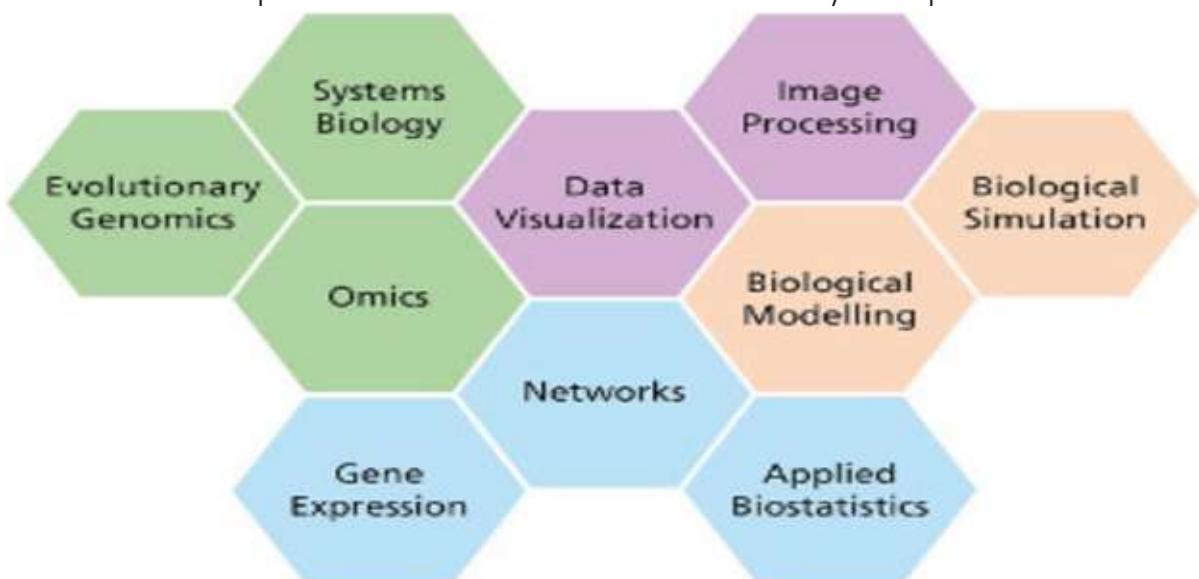
A new approach to data collection

Biochemistry is often an anecdotal science. If you notice a disease or trait of interest, the imperative to understand it may drive the progress of research in that direction. Based on their interest in a particular biochemical process, biochemist have determined the sequence or structure and analyzed the expression characteristics of a single gene product at a time. This often leads to a detailed understanding of a biochemical pathway or even protein. The internet has changed how scientist share data and made it possible for one central warehouse of information to serve an entire research community.

What challenges does Biology offer computer scientists?

The goal of biology, in the era of the genome projects, is to develop a quantitative understanding of how living things are built from the genome that encodes them .

Cracking the genome code is complex. At the very simplest level, we still have difficulty identifying unknown genes by computer analysis of genomic sequence. We still have not managed to predict or model how a chain of amino acids folds into the specific structure of functional protein. Biological datas are very complex and interlinked.
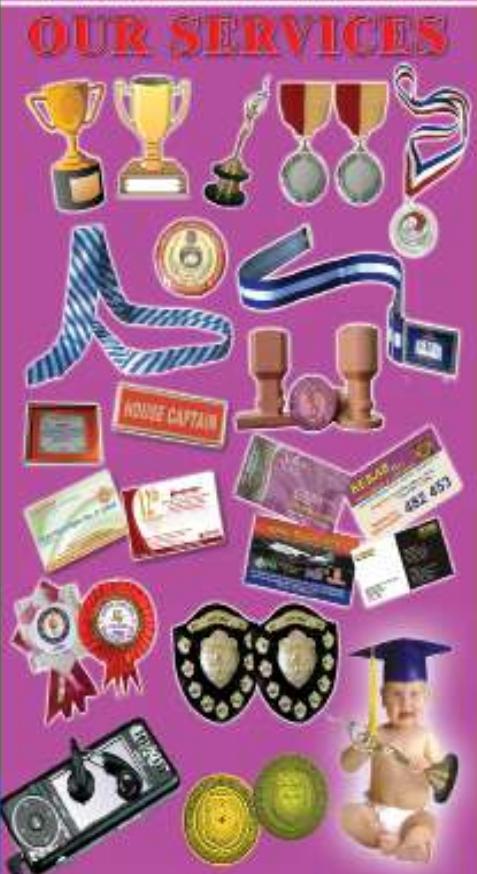
A spot on a DNA array to layers of information about genomic location, DNA sequence, structure, function and more. Creating information system that allow biologist to seamlessly follow these link without getting lost in sea of information is also a huge challenge as well as opportunity for computer scientists.

DIGITAL MARKETING

Aakash Giree
CE 3rd Year

The only fashion that never fades is digital marketing. "What's new in digital marketing?" The answer, everything. Digital marketing is the set of marketing efforts that use electronic media or the Internet. Businesses leverage digital channels such as search engines, social media, email and websites to connect with current and prospective customers. Digital marketing methods such as search engine optimization (SEO), search engine marketing (SEM), pay-per-click (PPC), content marketing, influencer marketing, content automation, campaign marketing, data-driven marketing, e-commerce marketing, social media marketing, social media optimization, email direct marketing, display advertising, e-books and optical disks and games are becoming more common with advancing technology. In fact, digital marketing now extends to non-Internet channels that provide digital media, such as mobile phones (SMS and MMS), callback and on-hold mobile ringtones. Digital marketing's development since the 1990s and 2000s has changed the way brands and businesses use technology for marketing. Digital marketing campaigns are proving to be better than traditional marketing campaigns as more people use digital devices instead of visiting physical shops. The major marketing technique in digital marketing is by publishing advertisements (colloquially referred to as ads) on social sites such as Facebook, YouTube, Instagram, Twitter, etc. Internet users are increasing day by day in the world. About 55% of the total population uses the Internet in the world. In Nepal, 63% of the people are internet users, which is a large number considering Nepal being an underdeveloped country with high technological illiteracy. Since 85% of buyers search before purchase and 89% of customers purchase based on reviews, digital marketing seems to be the right decision for the better future of most Nepalese people.

Digital marketing is beneficial in various ways. They are:

1. It can reach large audience groups.
2. It can target the right audiences. Suppose I want to target only the students (people within the age group of 20-40), then I can target them specifically through digital marketing by showing relevant ads to the necessary users.
3. It is cost effective. We can start a digital marketing strategy completely for free.
4. High return on investment depending on the product, pricing structure, etc. 5.It can scale the business very fast. Amazon, for instance, an online marketplace offering services all over the world, expanded so fast because of marketing strategies in the digital media.

Some career opportunities for digital marketers include:
1. Entrepreneurship : Starting one's own business and selling products through digital media.
2. Freelancing : Working on individual projects and doing available jobs online provided by clients.

3. OnlineEarning: Earn from AdSense/ Affiliate.
4. Professional job : Working for a company.

Some of the online businesses which seem to be successful through digital marketing in Nepal are:

1. "Daraz online shopping" is Nepal's number one online shop where we can order almost any types of products.
2. "Foodmandu" where we can order for our desired food items from different restaurants.
3. "Hamro Patro", which is a calendar app developed by Hamro app developers, is one of the first Nepalese apps to be downloaded more than a million times.

Digital marketing can work for any business in any industry. Regardless of what your company sells, digital marketing still involves building out buyer personas to identify your audience's needs and creating valuable online content. However, that's not to say all businesses should implement digital marketing strategies in the same way. Digital marketing where knowledge is not of much importance, we can get generalized information by simply googling it. Therefore, digital marketing is the thing where we should be able to present our skills in a better way. Only the new skills and abilities can and should get the best market.

DARK SIDE OF THE INTERNET

Bisheshwor Bhatta
CE 3rd Year

Internet contain at least 4.5 billion websites that have been indexed by general search engines like Bing and Google but according to different researches, we are unaware of the actual vast internet world behind all these. There are 400 to 500 times more websites that can't be searched by general search engines known as dark web.

Dark web is the World Wide Web content that exists on darknets that are overlay networks that use the Internet but require specific software, configurations or authorization to access. The dark web includes small, peer to peer networks as well as large popular networks like Tor, Freenet, I2P and Riffle operated by public organizations and individuals. Dark web is also called as 'onion land' referring to the layered behavior of an onion, a reference to the network's top level domain suffix .onion and the traffic anonymization technique of onion routing.

Dark webs are only accessible through networks such as Tor: 'The onion routing' and I2P: 'Invisible Internet Project'. Tor browser allows user to access and view all the .onion sites in the dark web keeping the viewer anonymous. Tor browser assigns the location of the different country for the view in first layer, then different country and IP address in second layer and the different country location and IP address in third layer. That means, Tor browser creates a virtual circuit of different fake locations and IP's between website and browser to keep the viewer anonymous blocking all the harmful and encrypted messages and malwares.

Actually, the ironic part about the 'Tor browser' is that the most popular software for making and accessing dark web sites was originally created by the U.S. Navy. Even today, Tor is funded by the U.S. Government. But, that doesn't mean the federal agencies are supporting all the stuffs in the dark web. 'Tor browser' was created for the message encryption and anonymously complete the federal job by entering the safe side hiding behind the mask.

WHAT DOES DARK WEB CONTAIN?

It is curious, interesting and quiet frightening as well to know about what dark side of the internet consists of. Many researchers suggest that 99% of the global internet is dark web. The example of iceberg is taken every time while talking about the dark web internet. If an iceberg floating in ocean is considered as the whole internet world then the part that can be seen above the sea level is the internet that can be searched by the search engines and the iceberg the part below the sea level is the dark side of the internet. If the dark web is such big then it must contain enormous amount of stuffs and it does.

•Dark side of the internet is the database and memory of different federal, public organizations and personals.

•Many illegal activities like Hitman hiring, Bitcoin mining, fake id creation, buying and selling of weapons and drugs, human trafficking transactions, leaking the contents and secrets of different celebrities and other individuals and other information that people don't want us to see are in dark web.

•Around 15% of the dark web is used for the transaction of drugs.

•There are numerous carding forums, PayPal and Bitcoin trading websites as well as fraud and counterfeiting services. Many sites are scams themselves. There is a website where you can buy the passport of United States in just $20 and create a Pay Pal account of balance $1000 paying only $18.

•There is a site called 'Red Room' in dark web where one can view the live murder. By paying the fixed charges in bitcoin, viewers can really see the live murder happening somewhere in the world. They fix the date for the murder and interested viewer can reserve the seat following their criteria. 'Red Room' differentiate their viewers in three categories:

1. Spectator: can only watch the live murder (charge: 1 bitcoin)
2. Active Viewer: can give order to murderer to do the things they want (charge: 5 bitcoins)
3. Team Member: can be present in the room (charge: 15 bitcoins, but only few will get this)

•There are many sites in dark web that promotes illegal pornography such as child pornography, bestiality, animal pornography and rape.

•There are many real and fraudulent websites claiming to be used by terrorist organizations.

•Facebook and other traditional social media platforms have begun to make dark-web versions of their websites to address problems associated with traditional platform and add users across every side of the World Wide Web.

THINGS YOU NEED TO REMEMBER

It would be much better not to enter the dark side of the internet. Otherwise, you will end up seeing the contents that you would not want yourself seeing. But, if a 'NO' will make you even more curious about dark side of the internet then there some things that you should know before entering the dark web.

•Never try to access onion sites without encrypting software that masks IP address of your device.

•Never try to access onion sites through the browsers like 'Google chrome', 'Mozilla Firefox', 'Microsoft Edge', 'Opera' etc. Tor browser is the best option to access these sites. Using VPN will help a little more.

•Never make the tor browser full screen while surfing the onion sites. It may lead attacker to know your screen size leading them to access a bunch of information.

•Frequently change your location and IP address. Using Tor browser will automatically solve this problem.

•Before entering any dark websites, you need to know about what the site is about otherwise you will enter the site where you would not want yourself to be.

•Remember that, dark web is illegal, just accessing the dark web can set off the red flags at the federal and intelligence investigation agencies.

•If any suspicious actions occur in your device while surfing the dark web it is better to exit out immediately and destroy the device memory and get out of the internet as soon as possible.

Dark web is the internet that many people want to know about but don't want in. It is nice to gather the knowledge but moving yourself to danger knowing the result is foolishness.


```
Algorithm of Success

while(noSuccess)
{
        tryAgain();

        if(Dead)
                break;

}
```

TECHNOSTRESS

Unique Karki
CS 2nd Year

The tremendous advancement in technology has enabled us to collaborate and share information between people separated by border, language and ethnicity. In the process of doing so we have come a long way. Today everything is just a touch away from us.But at the same time, the availability has come with a steep price – it has become a major factor in inducing stress known as technostress.

"Technostress (Brod, 1982) refers to stress that results from both the use of information and communication technologies and the pervasiveness and expectations of ICT use in society in general." Technostress is the negative impact of technology in human psychology.With the world advancing in the field of information technology, any information we desire is made available to us effortlessly via internet. Various websites and apps focus on this. But with increasing use of internet, comes its own disadvantages. Overexposure of content can be harmful to human mind. Technostress is becoming more obvious as it is manifesting itself physically. But it is a topic rarely discussed.

Technostress induces anxiety in such a way that we suffer from it unknowingly. Many of us feel the urge to know what is happening around us and in the world even if it does not impact us in any way. This compulsive behaviour brings technostress. An extensive research done in Jaume I University reveals that "technostress experiences are characterized not only by technostrain but also by an excessive and compulsive use of ICT." Craig Brod states that technostress is "a modern disease of adaptation caused by an inability to cope with the new computer technologies in a healthy manner." We have created something and overexploited it before knowing how to control it.

Technostress is what occurs when demand for content exceeds the human capacity.

Technostress induces various symptoms, one of which is anxiety. Anxiety of different forms brings different effects like irritability,headaches, backaches, eye strain, neck pain, stiff shoulder, joint pains, mental fatigue, depression, nightmares, panic, resistance, and a feeling of helplessness. Many people who are suffering from anxiety induced by technostress constantly feel low without no specific reason. These symptoms are very much seen in today's youth. Use of social media has become an addiction. Social media apps like snapchat, instagram, and many more are designed specifically so as to constantly provide feeds and update of their contacts. This makes the users hooked in their phones and laptop cutting them off from the real world and human interaction.
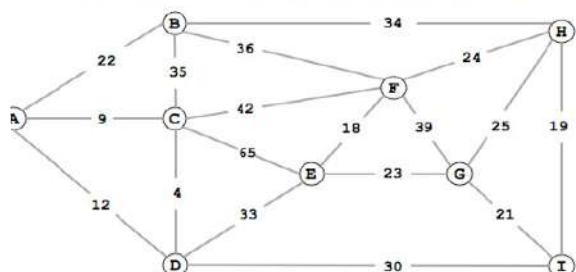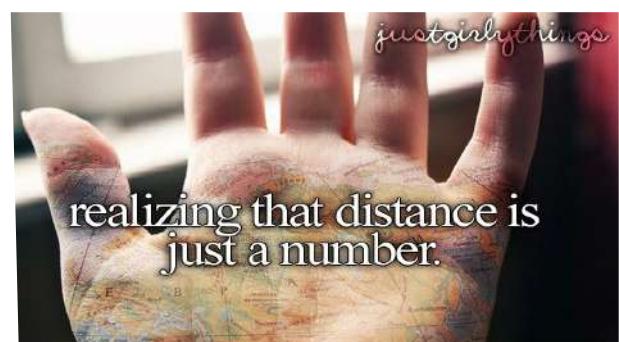
This symptom has not just inflicted the youth population, but virtually all the demographics have been diagnosed with the illness. As real time progress of work can be updated constantly so many working people focus on providing and receiving work related information and the centre of their life becomes totally absorbed in technology. We can see that many people take pictures just to post on the social media and not to experience the fun of it. This develops an uneasy feeling when the person is cut off from the use of technology. Being totally absorbed in social media has a direct psychological impact.

The impacts of technostress is not only in individual level but seen globally in various organizations and even countries. Cyberwarfare is a real world threat that has the potential to destroy organizations and bring out war among countries. Tension is

being built up among countries and people are taking advantages of it. Recently 58 of our government websites were hacked. All of this is due to the tension created in the global scale by technology. If we go in the direction in which we are heading now it will not be long when the world ends in the battle of the technology. There's outburst of tremendous amount of suppressed feeling and thoughts in an unhealthy way due to it.

If technostress wins over mankind then the creative human mind becomes slave of what we created ourselves. It would destroy us from inside-out. The devastating impacts will be felt internally by almost everyone and soon the modern society would fall down to its knees.

So it is up to us to prevent the wildfire of technostress to spread rapidly. The first step, and the most important one, is awareness. Not much people are aware about it and are consumed by tech unknowingly. We must become responsible and courageous enough to educate the people around us about technostress and its impact. Researchers have proven time and again that it can influence the brightest minds. People needs to take a closer look at it and accept it as a fact that this can impact any person, and take some measures to remedy the situation. We should take control of tech before it takes total control over us.

HOW BLOCKCHAIN TECHNOLOGY WORKS AND HOW IT IS CHANGING THE WORLD

Anukul Parajuli
CE 3rd year, 1st sem
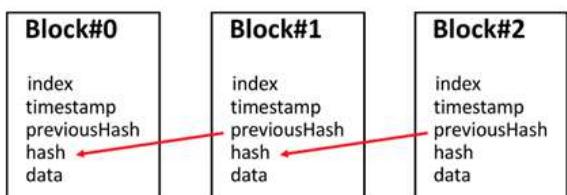
Mankind has seen revolutionary technologies that changed their lives for good. The Blockchain technology is no exception. Blockchain technology is completely changing the financial system by decentralizing every transaction (everyone can see all the transactions ever made on the blockchain), keeping track of each cryptocurrency generated or spent and anonymizing the users for privacy purposes.

Formally defining the term blockchain, it is a continuous chain of immutable (means it cannot be changed overtime) digital ledgers (also called blocks) connected by cryptographic links (also called cryptographic hashes) distributed over a network of computers using the same technology.

What it really means and how it really works (Explanation is simplified)

A Block and its essentials :

We start from the very beginning with the most primary part of the blockchain – a block. A block basically consists of a collection of transactions (records of exchange of bitcoins), a nonce (an arbitrary number from 1 to 4 billion), its own hash (hash is a 256

A SIMPLE BLOCK CHAIN

bit, 64-character code), the previous hash (hash of the previous block), block number and a timestamp (records the exact time the block was mined). The blockchain uses a hashing algorithm called SHA-256 (Secure Hash Algorithm) that takes in any amount of data (data can be text, image, video etc.) and turns it into a 64-character code called a hash. SHA-256 is very secure because even a 1-bit data change in the input produces a hash that is completely different from the earlier hash (also called the avalanche effect).

All the blocks in the blockchain store the own hash of previous block creating a chain of blocks, hence called the blockchain.

The peer to peer distributed network and Mining a block :

The blockchain network is a distributed network and the computers on the network hold the copy of the longest chain on the network. So, if any of the computers' chain is corrupted or forcibly changed, the system automatically detects and replaces it with the longest chain from other computers on

`0000f727854b50bb95c054b39c1fe5c92e5ebcfa4bcb5dc279f56`

A SHA-256 HASH
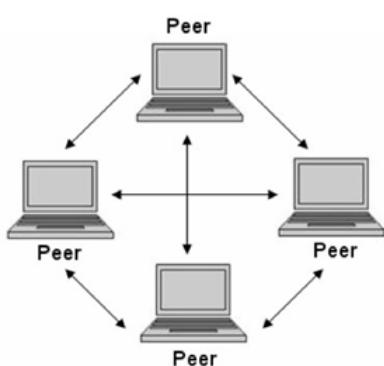
the network. This makes it impossible for the hackers to tamper with any block on the network.

Another important term in blockchain is mining. 'Mining' is a term that comes up very often but is misunderstood. Mining is the process of finding a nonce for a block so that when the block goes through the hashing algorithm, the hash obtained is below the target hash. Well what is the target hash? A target hash is essentially a hash allocated by the blockchain system so that the miners must spend a lot of time and resource for solving the cryptographic puzzle (finding the hash which is below the target hash).

Who are miners? Miners are the computers on the network that consume a lot of electricity and resources to solve the cryptographic puzzle of finding the golden hash (this hash is the own hash of the currently mined block and is used as the previous hash for the next block) that lies below the target hash. Upon finding the hash for the new block, the block is validated over the network and finally added to the blockchain. Why do the miners spend so much resources on mining a block? Well, upon mining a new block, the miners are rewarded with some number of bitcoins (currently, it is 12.5 bitcoins per block).

Competing chains and proof of work :

In a large blockchain, two systems may mine blocks at the same time. The system cannot decide which block to be added to the chain. So, the blocks are put on hold for a while and whichever system among the two competing ones mine the next block faster has the longer chain and its block is accepted and the system is rewarded (longer chain always wins). The winning system's both blocks are added to the blockchain and the losing system's block is discarded (also called the orphaned block). The discarded block's transactions are released into the system and these transactions can be mined again.

The block to be added to the blockchain is verified for its validity by sending the block and the recently found mined hash to each computer on the network. The computers pass the block through the same hashing algorithm to verify if the hash produced and hash received are the same (this is also called the 'proof of work'). If this condition is valid,

the miner is rewarded with bitcoins and the block is added to the blockchain. This simply demonstrates how a blockchain works.

What is so revolutionary about blockchain and how it can change the world :

The information held by a blockchain is continuously shared and checked for authenticity. By storing the information that are identical across the network, the blockchain cannot be controlled by a single entity or organization. Every transaction ever made on the blockchain system is recorded on all the computers on the network so that no user is cheated.

The traditional banking system is a completely centralized system of exchanging assets. Every transaction made must go through banks and banks manipulate how money is circulated throughout the world. A country controlling its own currency can print unlimited amount of money. This causes problems such as inflation (degradation in the value of money). People can hide money for themselves illegally by erasing the records of how they received that money (tax fraud and black money). This is the major cause for poverty around the world.

But in case of Blockchain technology, everything is transparent. Every transaction ever made is recorded in the chain and each user of the technology has the copy of the chain as a proof. The transactions are made directly from one person to another without any intervening body in the middle, so the transactions are fair. The amount of money that a user possess can be calculated through the blockchain. Bitcoin is one of the cryptocurrencies used in the blockchain technology and there is a limited number of bitcoins that can ever be produced (only 21 million bitcoins will ever be created). So, bitcoin does not suffer from inflation; its value is always deflating. So Blockchain may replace the traditional banking system to some extent, help people uplift from poverty and erase problem of decreasing value of money.

ESPORTS: A NEW ERA OF SPORTS

Ravi Prajapati
CE 3rd Year

Electronic sports or Esports is a major new sport to be invented over the last century. It is a competitive video gaming event where people from all over the globe compete with each other with millions of dollars at stake.

Esports existed even before the invention of the internet. The earliest known video game competition took place on October 19, 1972, at Stanford University for the game Spacewar, where students were invited to an "Intergalactic Spacewar Olympics" whose grand prize was a year's subscription for Rolling Stone. But it wasn't until 2011 when, Justin.tv launched a spin off platform called twitch.tv specially for their gaming section, everything changed. Twitch then went on to become the most popular streaming platform on the planet as Esports viewership numbers exploded.

Popular genres of Esports include fighting games (e.g. Street Fighter V), first-person shooters (FPS) (e.g. Counter-Strike: Global Offensive or CS:GO), real-time strategy games (RTS) (e.g. StarCraft II), multiplayer online battle arenas (MOBA) (e.g., Defense of the Ancients 2 or Dota 2, League of Legends or LoL) and sport-based video games (SBVG) (e.g. FIFA 19). Esports includes both individual (e.g. StarCraft II) and team-based (e.g. CS:GO) games, with the most popular games (Dota2 and CS:GO) featuring teams of five competitors battling against each other in head-to-head matchups.

Recently, Esports has gone through tremendous growth, incurring a large increase in both viewership and prize money. Looking at Esport revenue growth number provided by New Zoo (a market intelligence company specializing in the Esports industry), it is projected that by 2020, the Esports revenue is expected to reach almost 1.5 billion dollars; almost double of what it was in 2017. The global audience is also projected to grow from 385 million people in 2017 to a staggering 589 million by 2020.

The International 2018 is the world's largest Esports gaming tournament where gamers

battle it out over the globally popular multiplayer online battle arena game, DOTA 2. In its eighth year, the official prize pool has reached an all-time high of US $24.8 million exceeding any other Esports game prize pool to date.

The influence of Esport can also be seen in our country. With more number of people getting access to computers and the internet, the involvement of young people in playing such competitive video games has increased significantly in last decade.

'Nepal Esports Championship 2018' was the first ever Esports championship held in Nepal at Bhrikuti Mandap held by Nepal Esports Association (NESA). Dota2 and CS:GO seem to be most popular Esports in Nepal as of now. Various small Esports competitions are also being held by colleges and cyber cafés to inspire youth in the rising field of Esports. It may be difficult for some people to accept video games as a serious sport but with the increasing viewership and prize money involved, no one can deny that Esports is the new, modern sport.
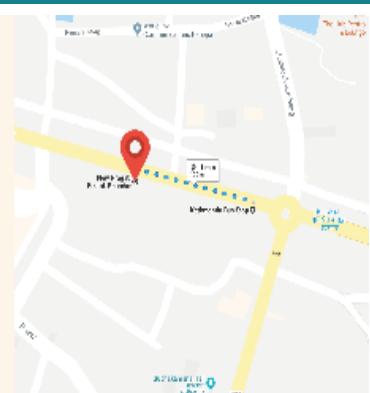
WHY DO WE CALL COMPUTER ERRORS "BUGS"?

Kamal Shrestha
CE 3rd Year

A SEMI-APOCRYPHAL MOTH

Grace Hopper was part of the tiny team that created the world's first programmable computer, Harvard's Mark I. That wasn't her only first, though. She was the first woman to receive a PhD in mathematics from Yale, helped create the first compiler for computer languages and was also the first woman to receive the National Medal of Technology. It's no wonder that people called her "Amazing Grace". Today, she's commemorated with the annual *Grace Hopper Celebration of Women in Computing*.

But why is Grace Hooper important in this buggy tale about computer bugs, you ask? Well, she is important because the best-known origin story for the computer

term "bug" is closely related to her. Here is how it goes. Back in 1943, Hopper was working for the US Navy while the country was in the thick of World War II. The stakes were high and there was a glitch in the Mark I that was hard to track down, given that Mark I was the size of a room. Eventually, though, Hopper found the problem, a moth stuck in Mark I's mechanical intestines. She smooshed the moth's corpse in her notebook and wrote next to it an entry dated September 9, "First actual case of bug being found." This, according to the Navy's website, **was the introduction of the term "bug"**.

But is it? Factually, the story mostly holds up. She wrote the note, though she may or may not have discovered the moth, and it might have been the Mark II instead of the Mark I. The exact year in the 1940s is also up for discussion. However, the real controversy is that she wasn't coining the term "bug" so much as punning on it — it was already in use.

SO, WHERE DID "BUG" REALLY COME FROM?

Well..., not from Hopper. Coining a term does usually require a little more explanation than Hopper included in her notebook and Hopper's papers show that she and others had been using the term for computer problems for several years prior to the moth incident. In fact, it even predates Hopper herself. According to the Oxford English Dictionary it first appeared in 1889, in a newspaper description of Thomas Edison.

Back in 1889, a reporter for the Pall Mall Gazette wrote:

"Mr. Edison ... had been up the two previous nights working on fixing 'a bug' in his phonograph — an expression for solving a difficulty, and implying that some imaginary insect has secreted itself inside and is causing all the trouble."
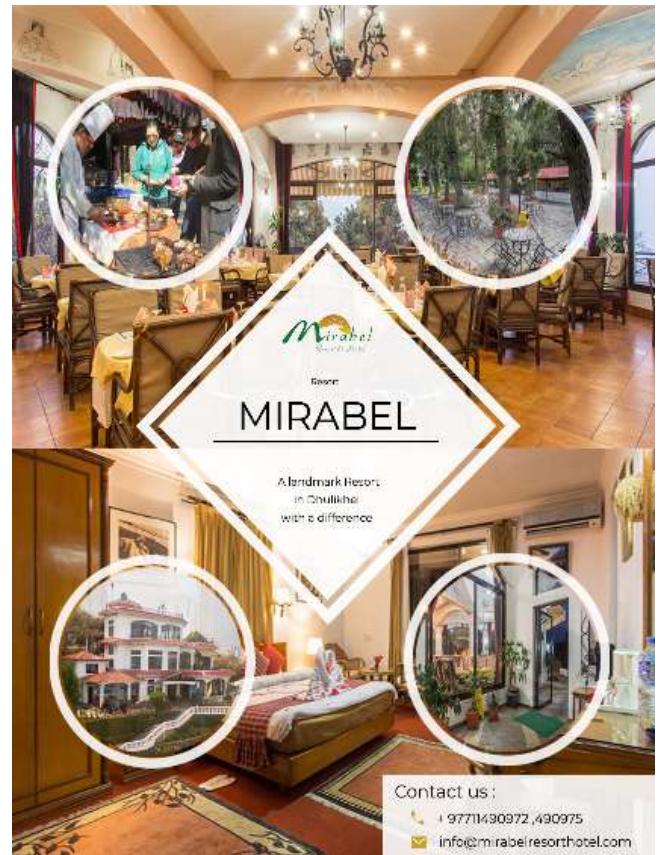
However, the term "bug" appears in Edison's private journals and letters, long before this article went to print. It seems that in addition to inventing assorted technologies in his lab, Edison also invented the term "bug" and passed it on to this reporter. A prolific inventor indeed!

So how did he come up with the term? Computer World notes that it is sometimes traced back to an ancient word for monster,

still visible in rarely-used words like "bug-boo". However, Edison's coinage seems less about ancient history than about literal bugs. He imagined little scapegoat bugs trapped in his glitchy machines. In an 1878 letter, he also notes that technological bugs "show themselves and months of intense watching, study and labor are requisite before commercial success or failure is certainly reached" — sort of like real bug infestations. You never notice roaches during the apartment viewing, after all. It is only once you move in that they reveal themselves.

So how did Hopper's moth end up taking so much credit? That may come down to Hopper herself. In the years that passed, she told and retold the tale of the moth in the machine, adding at one point, "From then on, when anything went wrong with a computer, we said it had bugs in it."

"Let me put it this way," Smithsonian's Peggy Aldrich Kidwell told the New York Times, "Dr. Hopper told a good story."

CYBER SECURITY, SURVIELLENCE AND ROLE OF PYTHON

Sandip Dulal
CE 3rd Year

For organizations to identify security threats and vulnerabilities, innovative security approach is necessary. The number of security researchers should be demanded in the context of Nepal so that the particular company can provide the secure role system in the context of network management and web application sector.

According to the Global cyber security Index, the cyber security strategy of our country Nepal lies in 94th rank. Due to ineffective government policy on security field and lack of production of different security researcher as a position of blue team and red team, a number of websites are being hacked continuously and banks have been repeatedly affected with a cyber war by hackers.

Let's discuss about the role of python (and obviously they love kali linux) other than than any other programming language in security field.

As we know, python coding minimizes the code to provide certain output of the particular projects other than any C, C++ or java programming language, so hackers or mostly security researchers go with python code to save their coding time.

Some of the possible case may be...
(a) Python code helps to build the tool related to keyboard logger i.e whatever the victim type in a keyboard, it will be directly observed by the black hat hacker.
(b) The python code helps to design the clipboard logger that might monitor the clipboard data for any sensitive data such as password.
(c) Create a tool related to screenshot logger and recording audio logger, to capture the images of the victim when he/she is using computer or record the audio from microphone what he/she is talking.
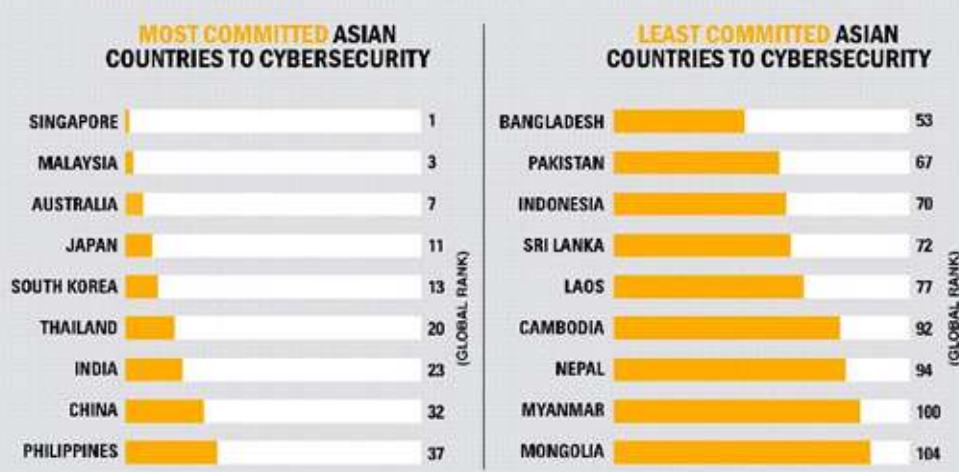
There are many open web application security project (OWASP) vulnerabilities listed. Some of them are:
(a) Cross site scripting (XSS)
(b) Indirect object reference
(c) SQL injection attack
(d) Broken Authentication & Session

GLOBAL CYBERSECURITY INDEX: Which Asian country has the best cyber security strategy?

Singapore is ranked first in a global ranking of 164 countries that measures strength of countries' cybersecurity strategy. Other Asian countries have holes in their defences.

MOST COMMITTED ASIAN COUNTRIES TO CYBERSECURITY

Country	(GLOBAL RANK)
SINGAPORE	1
MALAYSIA	3
AUSTRALIA	7
JAPAN	11
SOUTH KOREA	13
THAILAND	20
INDIA	23
CHINA	32
PHILIPPINES	37

LEAST COMMITTED ASIAN COUNTRIES TO CYBERSECURITY

Country	(GLOBAL RANK)
BANGLADESH	53
PAKISTAN	67
INDONESIA	70
SRI LANKA	72
LAOS	77
CAMBODIA	92
NEPAL	94
MYANMAR	100
MONGOLIA	104

Compiled by: ANN/DataLEADS

Source: Global Cybersecurity Index, International Telecommunication Union

management
(e) Expression Language (EL) injection
(f) Using component with known vulnerabilities
(g) Java Deserialization
(h) Cross site Request Forgery (CSRF)

Let's discuss about the mitigation technique of SQL INJECTION ATTACK. Suppose you have an admin panel of username= ' ' password= ' '
The possible case of SQL statement may use by the developer is...
*SELECT * FROM user where username='' AND password=''*
Now, suppose hackers target your site to bypass the admin panel then he may use different cheat to bypass username=' ' and password=' ' and finally he might bypass the panel and he can access to your site. You can stop the chances of bypassing the admin level for hacker through secure php coding.
The different case may be to secure the PHP CODING are:
(a)Use of MY SQLI SECURITY:
$con=mysqli_connect("localhost","","","";)
//Escape variable for php security
$email=mysqli_real_escape_string ($con, $_POST['username'])
$password=mysqli_real_escape_string($con, $_POST['password']);
Note: myqli_real_escape_string() function escapes the especial character in string in an SQL statement.
(b) Use of Prepared statement: Prepare
("INSERT INTO Myguests(username,password) VALUES(?,?,?)");

bind_param("sss", $email, $password);
Note: Prepared statement is more efficient and minimizes the chances of attack in compared to the mysqli security.
(c) Stored procedure
(d) Input validation
The above php security helps to secure the site mostly to prevent unauthorized access to the database, no matter your database information is md5 encrypted or not, if the black hat hacker bypasses the panel, your encrypted information can be decrypted too, so focus on coding to secure the site.
What is cross site scripting?
Generally called as XSS attack. If this vulnerability exists in the website than with a proper social engineering technique, the hacker might grab your cookies and can login to your system.
Only the developers are allowed to execute the javascript code into the site through developing phase, but if someone executes the malicious Javascript code, he may lead into the Remote code execution ineffectively.
For eg:
"><img src=x on error=prompt(document domain)>
<svg/onload=alert("xssbysandip")>
<svg><script>x=new XMLHttpRequest;x.onload=function() {document.write(this.responseT ext)};x. open("GET","file:///etc/passwd");x. send();</script>
The above written code is a malicious Javascript payload vector where if this type of code executes in an unsecure site, the hacker might proceed into the remote code execution level (can ready our password, root system, private information).
Conclusion: In a nutshell, every company should hire the pentester or security researcher to review the site developed by the developers as well as hire the network security researcher to look after network security. Mostly, the developers are unknown about the loopholes, leaking the private end point, leaking the sensitive information, leaking the configuration file and such findings can be observed by the security researcher. It is said that, "SECURITY IS JUST AN ILLUSION".

ADVANTAGES AND DISADVANTAGES OF WYSIWYG- WEBSITE BUILDERS

Sandesh Sukubhattu
CE 3rd Year

Does the title of this content look scary? The scary looking abbreviation actually means "What You See Is What You Get". WYSIWYG HTML editors are set to build web pages with no prior knowledge on HTML principles. The working process is so convenient that even if the user has no experience of Web development can create appealing interactive website. These programs do a great deal of good, but as with anything, there are cons regarding their use too.

PROS

1. They are easy to use, so even people who have no knowledge of HTML can use them to create their websites.

2. Gives you more creative control as you get to focus more on what the design looks like instead of what the HTML code looks like.

3. You will save time because a lot of things that take long time to hand code in HTML are quickly and easily done with a few clicks of a mouse.

4. You can make changes to content (text or images) in WYSIWYG editor, instead of searching for and inserting between HTML tags, or using a complex content management system.

5. Gives you more creative control as you get to focus more on what the design looks like instead of what the HTML code looks like.

6. Non-technical users have access to the power of web publishing.

CONS

1. Most WYSIWYG include HTML code that is hard to read that usually doesn't comply with Web coding standards set forth by the World Wide Web Consortium, also known as the W3C.

2. You will not be able to control the elements on the page as precisely as you can with straight HTML coding. While you will likely still be able to edit all of your alt tags, you will probably have to go through leaps and bounds to get to them.

3. The ALT text is used by search engines and thus it's a good idea to have your chosen keywords appear there. Example is the heading tags of a web page. These are very important from a search engine's point of view. Thus, you need to put your keywords in an <h1> or <h2> tag and not just have text that "look" big and appear as a heading.

4. WYSIWYG editors simply do not provide enough support and help in optimizing your web site for search engines. This may reduce the accessibility of the website. Even if you have created the most effective website but no one is able to locate it then that's useless.

5. For the guys like you of computer field, you will be classified as a "perpetual amateur" (and never be taken seriously).

```
# you may think that this function
# is obsolete, and doesnt seem to do
# anything. and you would be correct.
# but when we remove this funtion
# for some reason the whole program
# crashes and we cant figure out why,
# so here it will stay.
```

DO ROBOTS DESERVE HUMAN RIGHTS

Kushal Bhatta/Rajshree Rai
CE 4th Year

The humanoid robot Sophia was recently granted citizenship in Saudi Arabia becoming the first robot to receive citizenship anywhere in the world. Many were upset with this news as she was granted more rights than women living in the same countrya. The rest brushed it aside as a ridiculous PR stunt. However, this situation sparks a debate: "Should Robots be given Human Rights?"

Unlike Sophia, most robots do not show human like characteristics. But for the ones who do, can one deem it necessary to provide rights like citizenship? Will those robots at some point deserve "human rights" or "personhood rights"? How will we determine when that point is reached?

When, if ever, will a robot deserve "human" rights?
- When it possesses an uploaded personality (a formerly living human instantiated in an artificial body)
- When it can make a copy of itself (reproduction without the aid of another species)
When it passes the Turing Test (can convince experts that it is capable of human-level "thinking")

FOR

- The human brain is just a computer; neurons on and off, 1's and 0's; input observation or, output reaction. It is a complex program of chemical signals, but that doesn't make our emotions any less real. If we program robots with the ability to feel, they deserve the same or similar rights.
- If they are able to feel pain physically or emotionally.
- If the denial of rights to robots creates an irreconcilable conflict between humans and robots.
- If robots achieve human consciousness.

AGAINST

- If they were produced to be conscious but still have been indoctrinated/ programmed to believe a certain way, then their right to vote could be exploited to influence an election.

- They should only be given rights that they themselves advocate for. Only when robots are capable of understanding what a right is can they be eligible to gain that right. A robot that doesn't understand property cannot be given a right to property, for instance.
- Giving robots rights might take away the liabilities of the owners in case of accidents.
- Demanding rights for robots when the world is fighting for women's rights could result in a controversy.

Are robots equivalent to humans? No. Robots are not humans. Even as robots get smarter, and even if their intelligence exceeds humans' intelligence, it does not change the fact that robots are of a different form from humans. To put it simply, a robot is a technology to help humans.

Should robots be given rights? Yes. Humanity has obligations toward our ecosystem and social system. Robots will be part of both systems. We are morally obliged to protect them, design them to protect themselves against misuse, and to be morally harmonized with humanity. There is a whole stack of rights they should be given, here are two: The right to be protected by our legal and ethical system, and the right to be designed to be trustworthy. But what about the rights Human enjoy? Don't these Robots deserve

them too? The answer remains conflicted.

With each advance in robotics and AI, we're inching closer to the day when sophisticated machines will match human capacities in every way that's meaningful: intelligence, awareness, and emotions. Once that happens, we'll have to decide whether these entities are persons, and if they should be granted human-equivalent rights, freedoms, and protections.

American lawyer and author Wesley J. Smith, a Senior Fellow at the Discovery Institute's Center of Human Exceptionalism, says we haven't yet attained universal human rights, and that it's grossly premature to start worrying about future robot rights.

The debate goes on and new opinions arise. After all, who is to say who's wrong?

MESSAGE FROM ALUMNI

Kathmandu University has turned many little scared caterpillars into strong colorful butterflies. I see myself as one of them. The four years spent at KU not only taught me lessons of books and life but also groomed me to become fearless in words and action.
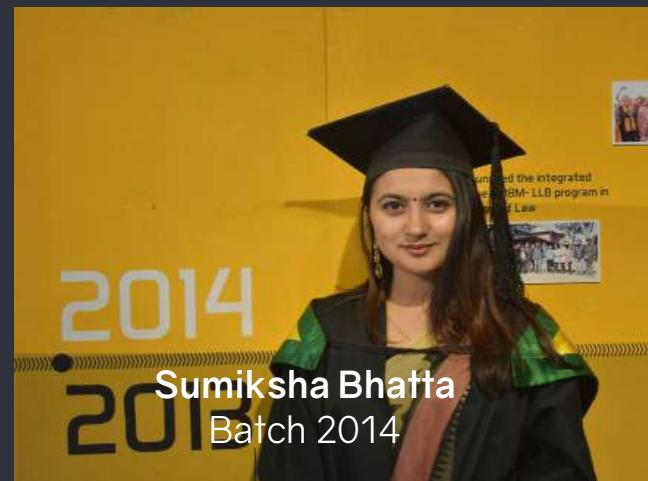
KUCC has been one of the most prominent part of my KU life. I have been directly associated to KUCC for three complete years. And with it, been associated to all the IT Meets and every activity happening through DoCSE. What I believe is that, KUCC is a platform that has the potential to unleash the best in you.

I feel lucky to have lived a life that many don't even have an idea about. Hail KUCC! Hail KU!

Sumiksha Bhatta
Batch 2014

Shubham Joshi
Batch 2014

There are a lot of things to do in university. From humanitarian activities to building a supercomputer, what I meant here is there are opportunities to engage yourself in diverse field. Be experienced taking most of the opportunities and start making a priority from what you experience. Later on, it would be helpful to know yourself better, to know where you belong and what you love.

Fail fast, fail early, fail often; learn fast, learn early, learn often. Make better version of yourself everyday. Go explore and experiment with things beside classes, it's your time people. At the same time, enjoy the journey of exploring and experimenting and enjoy your life at KU.

Kiran Kumar Chaudary
Batch 2014
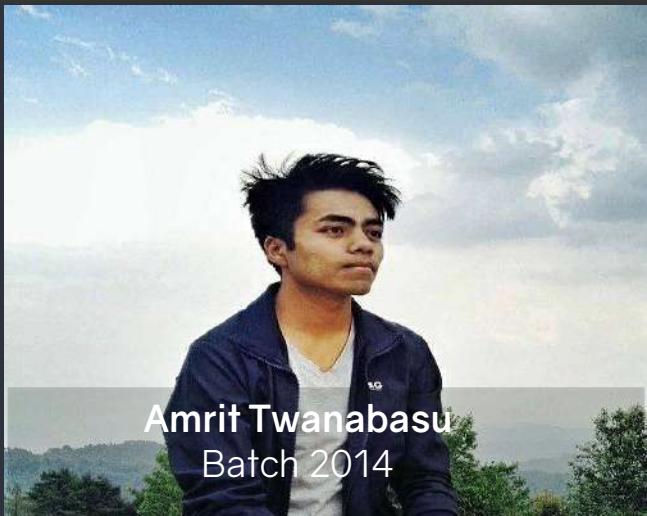
Involving in kucc not only harness your engineering skills, it also teaches you how to work in a group. This way we get to learn the skills that we lack. This ultimately makes us professional and helps to accomplish our dream project.At the end I request to diversify their skills in open source, problem solving, mobile and software development. At the end of 4 years of engineering, you will see all the results of your hard work.

Mahesh Kafle
Batch 2014

During these 4 years I learnt the importance of friendship in life and the art of staying calm at times.And also remember rely on yourself and not just teachers.You are the most important thing in your life and not one else is .So enjoy to the fullest.

Yudeep Rajbhandari
Batch 2014

The whole four years in KU is such an unique and amazing experience you would not find anywhere else. Enjoy every moment of lazy sunbaths during class breaks, going formal to give project presentation, even completing your assignments by hook or crook and anything that life at KU throws at you. Take up as much challenges as you can. Aim to be the best. Then, opportunities will present before you. You just have to dare to take it.

Amrit Twanabasu
Batch 2014

KU is the best thing that can happen to you. You stick around for four years but make memories that last your entire life. You make relations that will shape who you are. You make bonds. KU will give you the nurturing you need to prepare for any challenges you may face in later life. Juniors, stay alert. Your life has just started. And Kathmandu University Department of Computer Science and Engineering is the first step.

Sandeep Neupane
Batch 2013

PHOTO GALLERY
2015 – 2018

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DOCSE NON-TEACHING FACULTY

COMPUTER ENGINEERING BATCH OF 2015

COMPUTER SCIENCE BATCH OF 2015

COMPUTER SCIENCE BATCH OF 2015 FEBRUARY INTAKE

COMPUTER SCIENCE BATCH OF 2016 FEBRUARY INTAKE

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COMPUTETR ENGINEERING BATCH OF 2017

COMPUTER SCIENCE BATCH OF 2017

COMPUTER ENGINERRING BATCH OF 2018
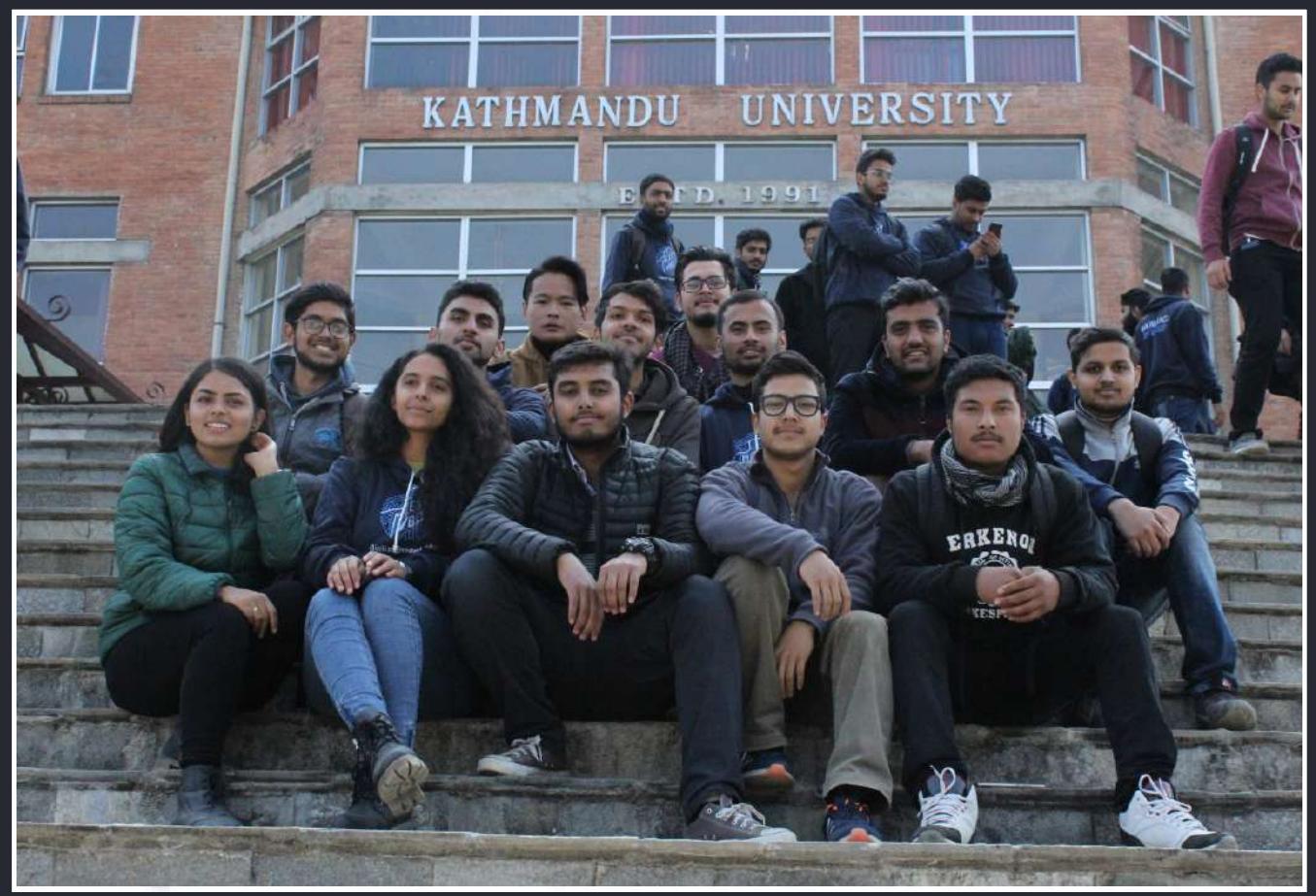
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ABOUT IT MEET

I T MEET is the largest non-profit tech meet up organized at University level by the Department of Computer Science and Engineering (DoCSE) of Kathmandu University, held annually in Nepal. It is a multitude of conventions and events that aim to appreciate and celebrate the growing IT market in Nepal by rewarding and promoting brilliant student bodies in this field through various competitions. IT Meet blends together the commercial and educational aspect of information technology by bringing together people who are already in this field or those who are thinking of entering this field and creating a melting pot of people to get educated about IT.

The event is targeted mainly at young enthusiasts in the field of computer science and technology. We want to encourage all the IT related students to learn about the current milestones in the field of technology. IT MEET aims to provide exposure to ideas, software products, hardware products of the undergraduate students in this field. IT MEET is a platform for young and budding students to get exposure to various IT companies in Nepal as well as further learn about the career opportunities for someone pursuing IT in Nepal.

ROADWAYS OF INFORMATION TECHNOLOGY AT LAXMI BANK

Since its inception back in 2002, Laxmi Bank has left no stone unturned when it has comes to introducing new innovative digital channels to the Nepalese banking platform. Just taking a glimpse at the past, Laxmi Bank adopted one of the most versatile core banking solutions - Flexcube, which was indeed a big leap forward for the bank at that point of time. Likewise, Laxmi Bank became one of the firsts to adopt IP based SWIFT Net technology within the SAARC region in this era. And by 2005, we were able to unfold most of the new and decent digital channels that were available for the first time in Nepalese banking industry like Internet Banking, SMS Banking, eMail Solutions, transaction alert systems, Prepaid Cards over the SCT Network, Bill Payments across all channels, Kiosk and Electra Financial Transaction Switch and much more. Apart from the CBS and Financial Switch, most of the solutions we have come up with are home grown through continuous R&D and testing at a productive environment catered by our banking system. The most admirable thing Laxmi Bank has done, in my view, is the installation of our system that catered for Gulf and Malaysian remittances, while also managing domestic remittances simultaneously from the same system. Being the first bank to accommodate for Malaysian remittance, Laxmi Bank has always been a step ahead when it comes to building a confident technological platform that allows for customers in both the international and domestic arena.

Then came the electronic wallet and smart phone era where Laxmi Bank positioned itself as a body that advocated for the integration of new innovative concepts such as the adoption of an external platform that assists for the partnership between partnering banks and other tele-communications. Hence, Laxmi Bank stands for its pivotal actions such as the introduction and collaboration of financial services like SCT, eSewa and share mobile wallets, thereby establishing itself as one of the pioneering banks in Nepal.

Besides serving customers with digital solutions, one of the integral roles of the IT department is to meticulously streamline internal processes which allows to adopting technological advancements that smoothly organize and process seamlessly with paperless office automation over the Intranet. This solution is one of our biggest achievements and we have savored it proudly as an outcome in this industry which most of the banks are still struggling to adopt.

In 2015, as for the earthquake aftermath, Laxmi Bank played a vital role in distributing relief funds in the most critical areas. Mobile based solutions were immediately developed and deployed to facilitate these types of transactions that were required in very sensitive and severe circumstances. Introduction of this assistance for relief has led our bank to become one of the most effective banks when it comes to delivering branch-less banking services in Nepal.

Likewise, our team considers the recent buzz word "Cyber Security" very seriously. There is no turning a blind eye to grave circumstances that have occurred in the past due to slight carelessness in the cyber security arena, so Laxmi Bank has invested in the most prominent end point security; Generation Next firewalls, and our team is devoted to maintaining secure banking membrane and incident management systems to ensure security for our customers' financials. Our team hence works to prevent, detect and react around the clock on any fraudulent and suspicious data that might encompass our network perimeter.

I must admit that a river does not run on the same course and our team did come across a few bends and falls over the years. There are a few products that were tried and tested but failed to sail as expected and we did learn from our mistakes to improvise and bring better suits to the customer's plates. Neither have we have ever stopped, and nor do we plan on stopping the flow of technological progress that comes hand in hand with changes to the action plans.

To say the least, Laxmi Bank's appetite is still not over yet and we devote ourselves to serve new trends for clicks and ticks, thereby allowing customers to experience a different dimension of delightful banking experience in the coming days. Nevertheless, we do foresee bigger challenges and competitions but our craving for advancements in the banking market is an urge that we cannot resist.
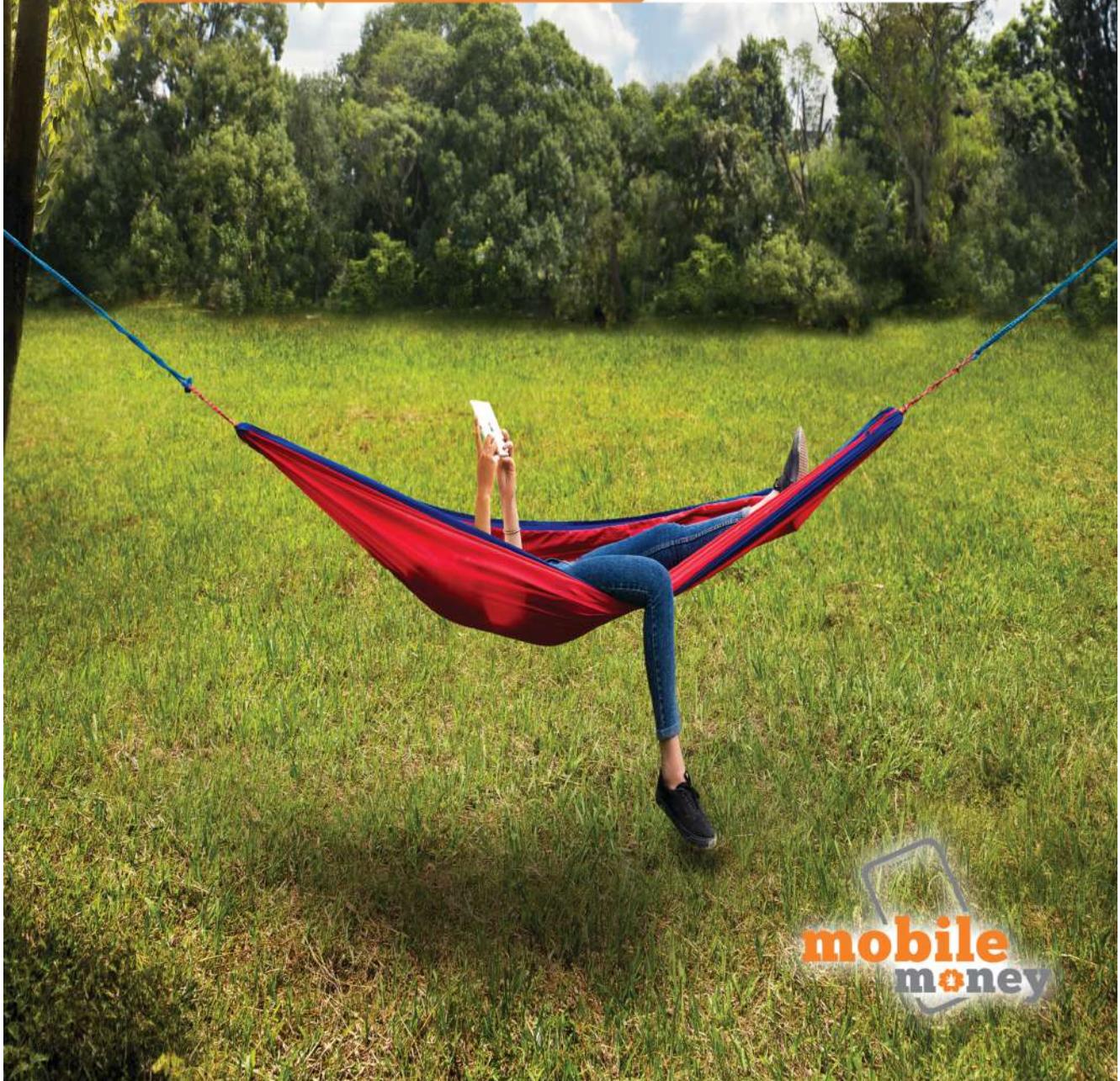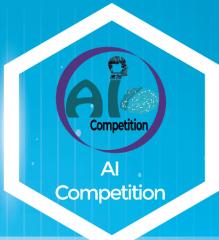
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Idea Pitching

PUB-G Competition

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Coding Competition

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Code Camp

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