During the past few months, we've also worked towards rethinking Beta's vision and goals for the coming year. You'll see a lot more focus on creating a learning environment, with improvements in inclusiveness and accessibility going a huge way to contributing to this. Issues of Beta will also have more continuity and consistency - we're introducing columns to Beta this year. Each column will be meticulously tailored to cater to the many different aspects of CSE and UNSW: from technical articles and industry news to happenings around CSE. Keep an eye out for our new columns in the next issue!

Having said that, we're continuously thinking of ways to improve and make Beta better. If you have any ideas or feedback, don't hesitate to send an email to publications@csesoc.org.au, we're always listening.

Enjoy the issue!

Siddhant Virmani
Editor in Chief | Publications Director 2018
WHAT’S ON
Programme - April 2018

CSESoc Weekly BBQ
(Wednesday, 11:00 AM onwards, John Lions Garden)

Come join us on Wednesday for our weekly BBQ! Pick up your weekly snag and get to meet new people while also picking up a printed copy of this newsletter!

GA X Startup Link X CSESoc
(Intro to Data Science)
(4:00pm - 6:00pm, Wednesday, Red Centre Western Wing Level 4 room 4035)

CSESoc has teamed up with StartUp Link and General Assembly to help you dive into data science with this workshop! Explore the job Harvard Business Review has dubbed “the sexiest of the 21st century,” and see how modern businesses are harnessing the power of data to drive innovation. Learn more and register at http://bit.ly(fb-datasci)

CSESoc Presents
CSE Trimester Evening
(6:00pm, Wednesday, Ritchie Theatre, G19)

Next year, UNSW will be moving ahead with the UNSW3+ Academic Calendar. This means that instead of having 2 semesters each year, all students will have 3 trimesters.

Interested in hearing how this will affect you? Want a summary of the key points before planning your degree for the coming years? CSESoc is partnering with the UNSW3+ Project Team and the School of CSE to give you an opportunity to find out how trimesters are going to work for CSE students. Find more info at http://bit.ly(fb-trimester)

CSESoc x GameDevSoc
(3D Modelling with Maya)
(Thursday, 6:30pm - 8:30pm, K17 seminar room)

Join us for our first workshop back from the mid semester break CSESoc x GameDevSoc: Autodesk Maya!!

No experience is necessary - let your talented instructor show you how it’s done, and you can go from greenhorn to 3D artist in just a couple of hours!

Dive straight into Autodesk Maya, modeling your own 3D objects and characters - a must have skill for any budding game developer or 3D graphics professional. Expand your network by chatting to your fellow attendees, and walk away having gained a new skill! Find more info at http://bit.ly(fb-3dmodel)
It's no surprise that there are less women in our tutorials, labs, and lectures compared to the number of men. The gender gap is an ongoing issue within the STEM industry and one that became apparent to me long before I entered university.

I remember back in high school being pulled out of my maths class with one other girl by our career advisor. We were told that we were the only girls from our high school to sign up for the Engineering Taster Day at UNSW. Although she was completely supportive, she asked if we had any change of heart. It was the first of many sad contemplations on whether I could “fit in” as a woman in a male-dominated industry I aspired to be part of. Why didn’t more girls sign up for the taster day? Why aren’t there more girls interested in Engineering? Am I meant to have a change of heart?

While I mustered up a reply my eyes had met the other girl and it was a moment of recognition that, wait a minute, I’m not alone in this. We both shook our heads and locked in our pursuit for careers in engineering, knowing we wouldn’t be alone during that taster day because we were in this together. Had it just been me, had it been one less girl signing up to that taster day, it would have been a different story – a possibility that I’d change my mind about engineering altogether.

The endless articles about why there are less women in tech seem to draw a conclusion that it’s due to sexism, a hostile environment, or that women are just not cut out for it. But for me, and like many other women, the one factor that could’ve steered me away from engineering was the fear of loneliness – a fear of being an outcast, which naturally stems from being the minority. So how do we combat that?

Silvia Lin is a Business and Information Systems student at UNSW who co-founded UNSW’s Women in Tech Society (WITSoC) in 2016.

“I personally struggled a lot in my first year of studies, and I constantly felt alone and behind in my cohort. It was only when I finally brought up my struggles to other students, that I realised we all shared the same experience.” – Silvia Lin.

Consequently, the planning and envisioning of a new society began with the mission to bring students who shared the same struggles and passion for technology together. It’s the first of its society at UNSW specifically catered to supporting and increasing the number of women in the tech industry and is sponsored by tech giants such as Amazon, Microsoft, and Google.
By creating this society, WITSoc’s aim to empower and encourage women to pursue careers in technology is overcoming the barriers that face minorities such as women in tech and removing the stigmas associated with the industry.

The society does this by hosting events that help to develop students’ soft and hard skills relevant to the corporate environment such as the Annual Hackathon with the Commonwealth Bank of Australia (CBA) and the Empowerment Program – where you get paired up with a mentor from Westpac.

Jessica Siu, a third-year Information Systems and Marketing student commented,

“Being part of the WIT club has definitely boosted up my confidence and self-esteem making my university a much more wholesome and enjoyable one.”

Now, you’re probably asking why does all this matter? Why do we need to support and empower minorities in tech? Well, because for the tech industry, by its nature, to be a pioneer of innovation and creativity and forming even more advancements and breakthroughs, it all comes down to diversity.

Diversity is the fundamental ingredient for innovation and it’s the key to the technology sector’s success.

A publication, “How Diverse Leadership Teams Boost Innovation”, from The Boston Consulting Group, indicates that companies with a higher diversity pool within their leadership teams generated better business innovation results with nearly half their revenue coming from innovative products and services. That’s 20 percent more than companies with below-average diversity on their management teams.[1]

The Harvard Business Review describes that “diversity unlocks innovation by creating an environment where outside the box ideas are heard.”

The HBR’s research on ‘How Diversity Can Drive Innovation’ found that without diverse leadership, women are 20% less likely than straight white men to win endorsement for their ideas; people of colour are 24% less likely; and LGBTs are 21% less likely.
These numbers can cost these companies crucial market opportunities; this is only further corroborated when a team with a member who shares a client’s ethnicity is 152% likelier than another team to understand that client and thus create a better product for that client.[2] So, as a student studying at UNSW what should you do? Be an active supporter of diversity because it’s the stepping stone to innovation and advancements in technology, and you can do this by joining a society whose sole goal is to increase diversity within the tech industry – WITSoc.

They currently have a community of 800+ members, and are hoping to increase their presence at UNSW this year with more student engagement - more members mean a greater reach for sponsors, more quality events, and a better chance for sponsors to seek talented and passionate graduates. The society has an inclusive culture where anyone of any gender, race, religion, and sexuality can support greater diversity within the STEM industries.

An executive male member of the society, Jie Sen Lin, stated,

"Being a Women in Technology executive has confirmed to me that females are fantastic leaders. Through our skyrocketing member base and strong member engagement, WIT helps males understand that women will continue to strengthen their rich impact in a disruptive world of technology. As technology evolves, our acceptance of what is meant to be evolves. I joined WIT to be directly part of this powerful movement towards equal opportunity which will without a doubt, engage us all in a fruitful innovation."

So, in summary, there are three points to take away from this article.

- To increase diversity in the tech industry we need support groups for minorities such as WITSoc.
- Increasing diversity matters because it’s the key to innovation.
- What we as students can do is be active supporters within these groups and form more groups like WITSoc so there is more engagement between the industry and minorities.

To conclude, WITSoc’s 2018 vision also includes increasing high school engagement through information sessions and skills workshops so high school students can get a taste of studying technology. Keep a watch out for their Empowerment Program, Annual Hackathon, and other Networking Opportunities such as site visits and sponsor representative visits on campus with companies like Amazon, Ernst and Young, Microsoft, Westpac, CBA, Google, Palantir Technologies, and RBA.

REFERENCES:


As a student, you’re conditioned to start your study sessions by pulling up Spotify and playing your favourite songs as you progressively crush (or get crushed by) problem sets. If you’re anything like me you have a mixed relationship with music while studying. On some days you’re typing straight to the tempo of each song and on others it’s literally like any productive thought you muster is hijacked by the beat and beaten to death.

It’s not a great relationship, but the alternative is suffering through the drone of noise present all through UNSW.

Finding a quiet place at uni is as likely as emailing Richard Buckland and getting a response within a couple of hours.

Lyrics disorient our language comprehension

Remember your essays during high school? Yeah, me neither, but I definitely remember listening to music with lyrics while brainstorming paragraph ideas and it was excruciating. In hindsight trying to mix music with lyrics and writing was a bad idea, but then again, so was procrastinating on writing my essays (I guess there’s no silver lining here). It’s generally better to forgo the lyrics as the late Stanford Professor Clifford Nash says,

"Music with lyrics is very likely to have a problematic effect when you’re writing or reading, but there’s probably less of an effect on math if you’re not using the language parts of your brain."

Noticeable creativity boosts with medium volume ambient noise by U.Chicago & UBC

The regular coffee shop ambience (at least for me) is too distracting. There’s a ton of interesting people living out gossip filled lives, and there’s usually hundreds of conversations simultaneously superimposing against each other. Thirty minutes have passed and I’ve written one line of code, sweet! However, studies from University of Chicago and University of British Columbia show that playing some ambient noise at a level that’s not screeching can lead to heightened abstract thinking and creativity. They propose that the coffee shop scene I described before, at a lower, optimal volume, slightly impairs your information processing ability, which “…induces a higher construal level, such that individuals engage in abstract thinking.” Funny how being just the right amount of distracted can potentially get you more creative.

Sound environment landscaping

This one is more so what songs are you choosing and what you associate with each song. You don’t want to be associating any odd memories with your study jam that could spiral you into a daydream. Case in point, whenever I listen to any song by Arctic Monkeys my whole body just wants to shut down - because those were some of my favourite songs and I played them to sleep. The effect is different for everyone, so if you need some safety sounds I’ve found the website "Coffitivity" (https://coffitivity.com/) to help a ton.

So, just in case you’re the type of person that needs their music to stay motivated and focused, I’ve compiled a playlist after our very own CSE Brass Lab! 12 songs. Beginning and end songs have lyrics, the rest are upbeat instrumentals. All brass themed. Check it out at http://bit.ly/brass-lab
Security is a major issue in the modern world and we are seeing the consequences of bad security measures every day. Very recently, there was a security breach involving American water company "Okaloosa Water and Sewer". The breach involved the leaking of customer credit or debit cards due to issues with an external vendor that processed the payments. [1] While this seems to be a problem due to a company’s inability to secure their systems, the problem might be closer to home than expected.

A report released by Zingbox [2] states that "41% of security issues were directly caused by bad user practices," with the second biggest cause being outdated systems at 33%. [3] Now, this report was done on stressed medical staff so that would explain why 41% of the issues were caused by staff members, right? They were just too busy to take internet security into consideration. While this could be the case for this study, a report done in 2016 by BakerHostetler shows that this human error does not only occur with medical staff but with other staff members too. Page 7 of the report, “Is Your Organisation Comprise Ready?”, says that "human error is a factor over half of the time (for breaches),” when analysing breaches across many different companies. These include engineering companies, restaurants, universities and even technology companies themselves. [4] Malwarebytes, an anti-virus company, wrote about a breach that happened to the United States Department of Defence, in which “a service member plugged an infected USB drive into one of the DoD computers which instantly infected the system.” [5] Let that sink in, the Pentagon, the building that you would expect to be heavily fortified got breached NOT by a Chinese or Russian spy but accidently by one of its own employees. I hope this evidence provided has convinced you that most of the security breaches are indeed caused by us, the people, the employees. The cumulation of movies that depict hacking as this sophisticated art completed by agents that are trained to type like Sonic the Hedgehog is a massive joke. And I am not kidding, it is actually a massive joke done by the directors. [6] The most common method for criminals to breach into a system is by exploiting an employee, which is why we as individuals should start engaging in behaviours that can protect our security.

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WHY YOU SHOULD BE USING A PASSWORD MANAGER

By Alen Huang
One security measure that a lot of us overlook is our password. This is however, to be expected as our brain can not remember 100 different passwords that are 25 characters long. So, what we do is make one super good password and use it for all our accounts. I mean this should be fine as companies DEFINITELY WON'T be careless with your passwords, right? Again, as you probably expected, not really. We can see from the news that websites that got hacked include,

- 000webhost
- Netflix
- Pastebin
- Zoosk
- Runescape
- LinkedIn

Sources come from [7][8]

You can check out the other database breaches from this website https://haveibeenpwned.com/ and check if you have a breached account.

So, what can be done about this? By using a password manager that stores all your unique passwords in a database. That way, if one password is compromised, your other accounts will not be at risk as they don’t share the same password.

Just by engaging in this practice you are taking a huge step towards being secure online. In fact, using a password manager (technically not reusing passwords) is recommended by many security experts as being the number one action that ordinary people can take to make themselves secure. [9]

You can of course go for the commercial password managers, https://www.tomsguide.com/us/best-password-managers,review-3785.html. Or you can go for the open source password managers such as https://keepass.info/. Whichever one you go for is entirely up to you. With an open source password manager, you are responsible for keeping the database of password, which can be a double-edged sword. This means that you are not relying on a 3rd party company to safely store your passwords which can make things secure but at the same time you are responsible for keeping the database is safe.

Hopefully, this article has convinced you to start using a password manager to secure your passwords. By engaging in good security practices, not only are we protecting ourselves but helping create an environment will not be as insecure it is currently.

REFERENCES

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The market for cryptocurrencies is a wild place. Almost everyday new currencies emerge, older ones are forgotten, early adopters get rich and investors lose money. Every crypto comes with an assurance - a big model to revolutionise the world. Most are pumped and dumped by speculators. Very few survive the first months.

At their core, cryptocurrencies offer financial freedom to the masses. They pave the way for a decentralised financial system. One that is free from centralised banks and financial institutions manipulating the market. In theory cryptocurrency brings power to the people and is a necessary step to prevent financial catastrophes like the Great Financial Crisis of 2007-08.

But for a lot people there is something deeply unsettling about cryptocurrency; it’s not backed by the government or any physical commodity. It’s been linked to several criminal organisations and is widely used on black market sites. It seems like something that emerged from the darknet and deserves to stay there.

The reality is traditional fiat currency isn’t perfect. The USD was divorced from the gold standard by Nixon in 1971. Britain’s gold supply covers roughly 4.05% of the pounds in circulation and it’s a similar story across the world. These days there is no physical commodity that backs the value of traditional currency completely. A central bank believes it can print currency without having enough assets to back that currency. It’s an arrogant system.

Cryptocurrencies represent the first wave of solutions to these issues. Wealth is owned directly by the people, there is no central bank or financial institution involved.

Decisions are based on a democratic consensus - one where everyone votes and has a say in the way the system is run. Transactions are usually settled within minutes at insanely low fees and everything is recorded on a public ledger or transaction blockchain - which is like a tamper proof database.

Most crypto currencies run on the blockchain, while a few use directed acyclic graphs (DAGs) and blocklattice structures. All of these structures are highly resistant to outsider manipulation, corruption and interference. Each change must be authenticated by consensus and is secured by cryptography. It’s not secured by corporations or financial institutions, but by maths.

Yes, the marketplace for cryptocurrencies is dirty and highly volatile. But it can revolutionise the world. This has already started. People all over the world are buying cryptocurrencies to protect from the devaluation of traditional fiat currency. Venture capital firms and large institutions are starting to buy into cryptocurrencies. More and more corporations are discovering the real-world applications of blockchain technology, such as ethereum’s smart contracts.

The fact is, cryptocurrencies represent a whole new financial system, one without investment banks and centralised authorities. A system run by the users for the users. If history is any guide, the democratisation of the political system was a rocky one, perhaps the democratisation of the financial system is on a similar path.
1. You have a 5L container and a 3L container. Given that you can arbitrarily refill and empty the containers, how do you measure out 4L?

2. A princess inhabits a row of 17 rooms in a row. Each room is connected to the ones directly adjacent to it. Every day the princess picks a new room to sleep in, adjacent to the one she was in the previous day (she is free to pick any room on the first night). A prince would like to find the princess but does not know which room she will be in, in addition the prince may only check one room per night. What strategy can the prince follow to guarantee he will find the princess within 30 days?

3. An ant is located on the vertex of a rectangular prism (with dimensions \(l \times b \times h\); \(l \geq b \geq h\)), and wishes to reach the wheat at the opposite vertex of the cube. The ant is capable of climbing on not only the edges of the prism, but also the faces. Having not eaten since issue 133, the ant wants to reach the wheat as soon as possible. What is the shortest path the ant can take to get to the wheat?

4. You and a friend have been trapped in cell with your jailer. The jailer agrees to let you go free if you can solve his riddle. The jailer tells you that he will place out 64 coins on a chessboard, each randomly oriented heads or tails. He will then send your friend out of the room and point to a coin. Your job will be to communicate to your friend which coin the jailer pointed to by flipping over exactly one coin. You and your friend are given time to work out a strategy before hand. Assuming both you and your friend are perfect mathematicians and logicians, what strategy do you come up with to fulfil the jailers requirements?

(Keep an eye out for the answers in the next issue of Beta!)