

CAREERS WITH STEMTM TECHNOLOGY

DOUBLE
ISSUE
FLIP FOR
CYBER
SECURITY

Career crush
on 5 awesome
Google gigs
p18



**SECURITY
ENGINEER**

Low-down on
the biggest tech
trends of 2021
p6

Got a big idea?
Discover how to
become a tech
entrepreneur
p12

CAREERSWITHSTEM.COM

SUPPORTED BY

IT + EMERGING TECH + SOCIAL GOOD + LAW + RETAIL + CYBER SECURITY

Google



Think IT. Think QUT.

Tammy Bryant loves working as a Chaos Engineer at Gremlin in San Francisco. Her job involves rigorously testing major IT systems to ensure critical data stays safe. It's a big responsibility, but she thrives on the many challenges that surface each day.

As a QUT graduate, Tammy hit the ground running with skills, confidence, and global connections to launch her career. To discover more of Tammy's story and learn about opportunities to study IT at QUT, search Ready STEM Go! ep3.



**the university
for the real world**



Get more
STEM careers
info on
CareerswithSTEM.com

GRACE CHUNG
ENGINEERING
SITE LEAD

CREATIVE. IMPACTFUL CAREERS

Technology creators are the creators of the future, says Google engineering site lead, **Grace Chung**

Technology has a role in every part of society: creating COVID-19 vaccines, addressing climate change, preventing and responding to events like the Australian bushfires of 2020, tracking endangered species and much more.

The kinds of roles you can work in have also evolved. There are many ways you can make a difference to the world through a tech career, whether that's by transforming the way we work, or creating new tools to help the disadvantaged.

Why computer science?

My background is in speech recognition, and I was interested in linguistics and computational linguistics. I entered computer science because I loved mathematics, problem-solving and creating. I learned to program when I was running experiments in my graduate program at the Massachusetts Institute of Technology in the US but I never thought I would become a software engineer until I got to join Google.

In the end, I specialised in building conversational agents and worked in industry research in the US before coming back to Australia.

What can YOU do in computer science?

Working in technology, you could be a software developer, visual designer or a product manager; you could come up with interesting new product ideas and work with engineers to create those products; you could be a user interface designer and create something beautiful.

There's also a wealth of new emerging careers to explore in artificial intelligence (AI) and quantum computing, as well as roles in technology and a myriad of other fields such as social good, finance, environmental sciences, biology and medicine.

Those who love maths and sciences usually thrive in tech but tech careers also extend beyond the 'computer hacking' type – there's also room for those who like to be creative and expressive.

Grace Chung

Engineering site lead, Google

**I NEVER THOUGHT I WOULD
BECOME A SOFTWARE ENGINEER
UNTIL I GOT TO JOIN GOOGLE**

BACHELOR OF ENGINEERING
/ SCIENCE, UNSW

PHD, ELECTRICAL ENGINEERING
/ COMPUTER SCIENCE, MIT (US)

SENIOR RESEARCH SCIENTIST, CORPORATION
FOR NATIONAL RESEARCH INITIATIVES (US)

SENIOR RESEARCH
FELLOW, NSW

SOFTWARE ENGINEERING MANAGER
AND ENGINEERING SITE LEAD, GOOGLE

What's inside?

FLIP THE MAGAZINE OVER FOR
CAREERS WITH CYBER SECURITY!

P6 Top tech trends of 2021

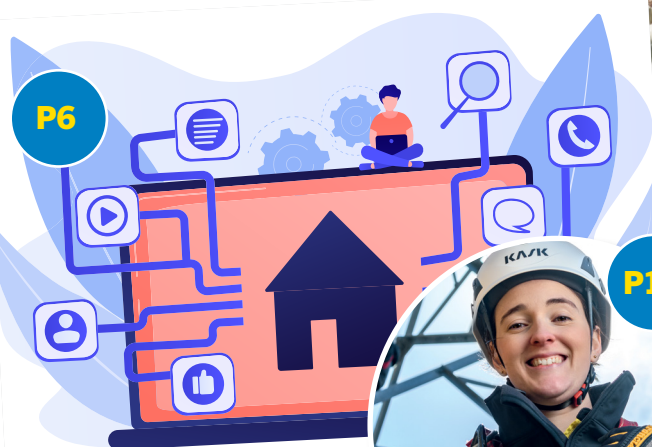
P8 Real-life tech pathways:
From internships to VET
qualifications

P12 How to turn your
big idea into a startup

P42 Next steps on your
pathway to a career in tech



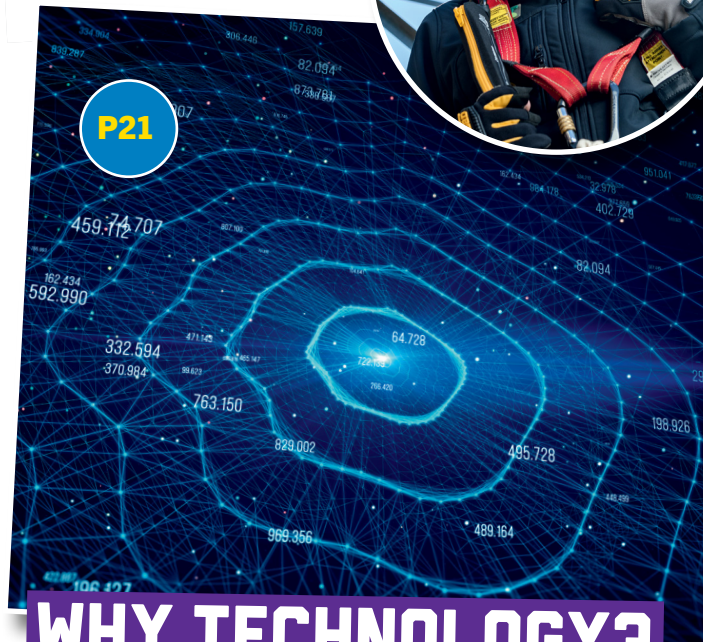
P32



P6



P10



P21

WHY TECHNOLOGY?

Technology is the key to a fairer, healthier, brighter future – and tech skills are more sought after than ever. According to the Australian Computer Society*, Australia is facing an Information Technology (IT) skills shortage, with 60,000 tech workers needed over the next five years, but just 7000 students graduating with IT degrees in 2019. One place we can make up that shortfall is by improving diversity in tech, especially gender diversity. Flip these pages to get inspired about diverse pathways into Australia's tech workforce and read about real-life mentors and role models.

STEM + X = 😊
Combine technology (STEM)
with your passion (+ X) to
discover your dream career.

Tech + ...

P16 IT
This one is for the
technology purists
who live and breathe
all things IT



P36

P24 Emerging tech
Dream of a future-focussed career,
that might not even exist yet?
Flip to this section

P30 Social good
Use your tech skills to make
the world a better place

P36 Law
Legal eagles are applying cutting-edge
technology and relying on tech skills
– find out how

P40 Retail
Love tech and online shopping? Add
these career options to your cart, stat



P40



Australian Government



I AM READY TO SUPPORT TO MOTIVATE TO FIND MY CAREER

Leaving school and thinking about next steps?

The Your Career website has everything you need to support your next steps in training, education and employment.

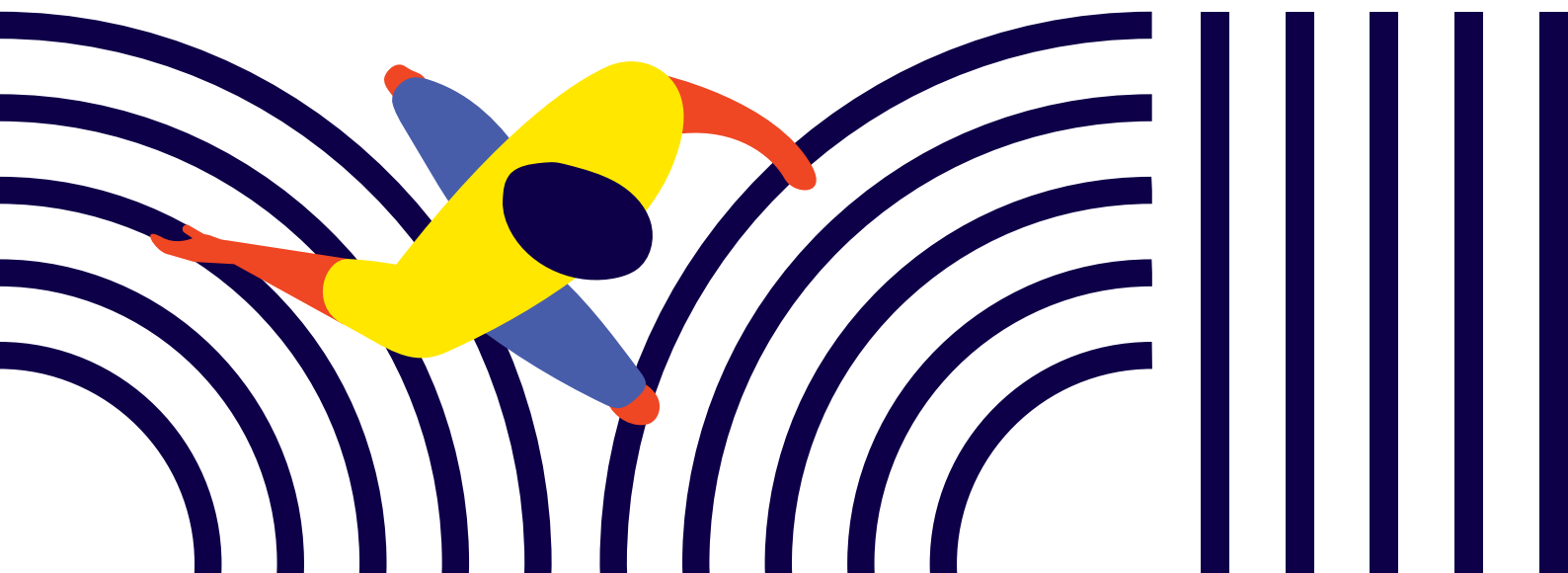
The tools on Your Career offer personalised information and advice by matching your skills, interests and goals to careers that may suit you.

You can explore over 1200 occupations listed from A-to-Z, see how much you might earn, learn what a real day on the jobs looks like, understand what kind of job prospects exist in a particular field - and what skills you need to get you there.

Find up to date, accurate careers information and advice about where the opportunities are now and where they'll be in the future at yourcareer.gov.au.

You can also access the School Leavers Information Service:

- calling **1800 CAREER** (1800 227 337), or
- texting 'SLIS2021' to **0429 009 435**



TECH REPORT

The biggest trends of 2021 explained

5G



Say hello to the next gen of global wireless tech! 5G is the fifth generational mobile network, designed to connect pretty much everything together – people, machines and, of course, devices. It's faster than 4G, streaming is seamless and real-time gaming is possible.

INTERNET OF THINGS (IOT)

If you hear someone talking about the IoT, they're referring to the billions of devices that are connected to the internet. These devices are equipped with sensors, software and other tech so they can exchange data with other devices. Anything can become part of the IoT if it has a computer chip and can connect to a wireless network – cars, industrial tools and even kitchen appliances.



EDGE COMPUTING



Edge computing brings data storage closer to a device's source, rather than relying on the cloud in a faraway location. It won't replace cloud computing though – it's more like the cloud coming to you! Proximity improves latency (response time), and this will be super helpful in areas like artificial intelligence (AI), machine learning and IoT data processing.

BLOCKCHAIN

Think of blockchain as a shared digital ledger that helps record transactions and track assets. Most famous for transferring cryptocurrency like Bitcoin, blockchain is also used in everything from government to transportation. It's popular because it can deliver information fast, transparently and securely.

VIRTUAL REALITY (VR)

VR is all about using computer tech to create a simulated environment that can be explored – and it's not just for gaming! VR is used in healthcare, retail, tourism, architecture, education and the automotive industry. – Louise Meers

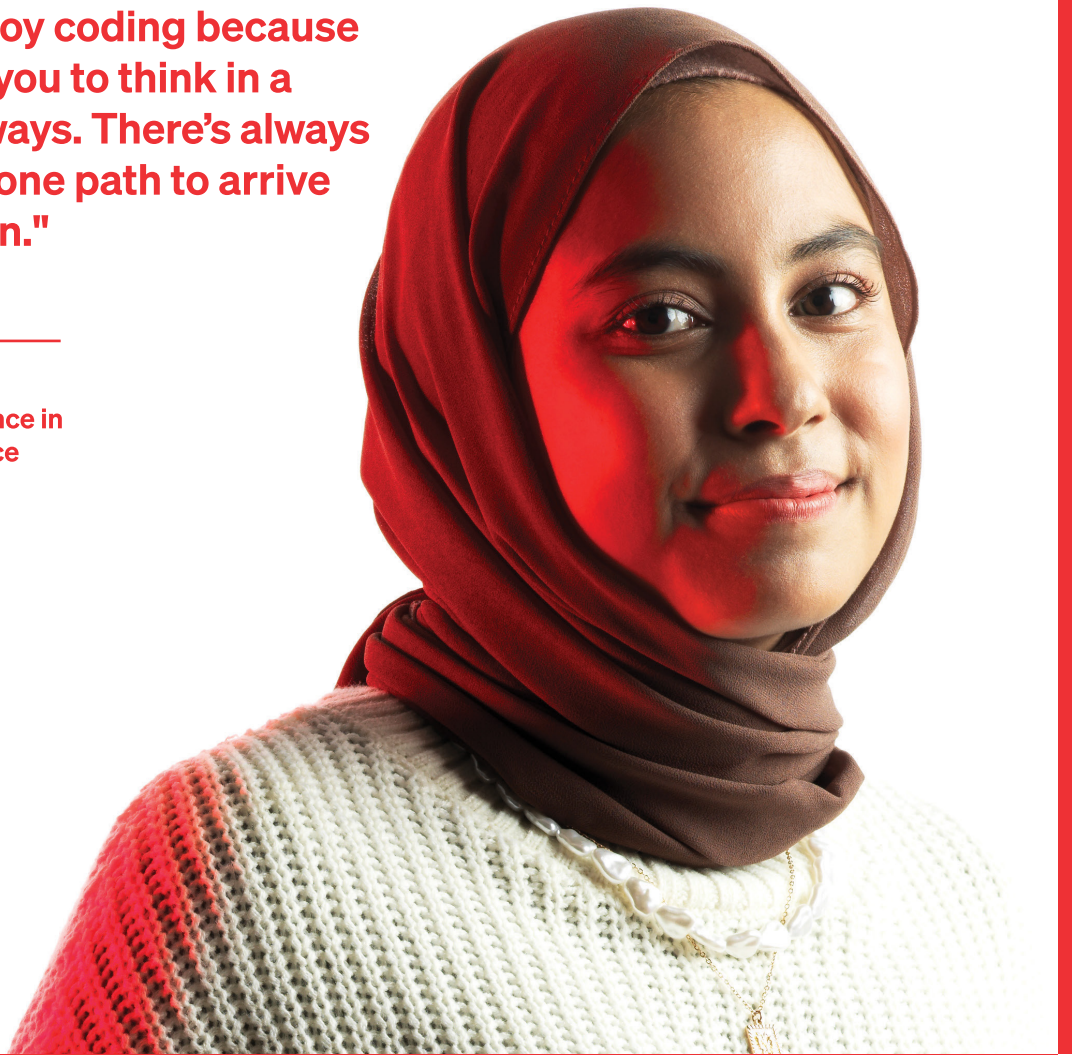


Did you know?

Blockchain was the number one skill on LinkedIn's list of the 10 skills most likely to get you hired in 2020.

"I really enjoy coding because it requires you to think in a variety of ways. There's always more than one path to arrive at a solution."

Maihani,
Bachelor of Science in
Computer Science



Crack the code.

Study computer science and
software engineering.

For more information, visit:
canterbury.ac.nz/csse/

UC  UNIVERSITY OF
CANTERBURY
Te Whare Wānanga o Waitaha

UNLEASH YOUR POTENTIAL

Want to kickstart your career while you're still at uni? An **Atlassian** internship is your opportunity

Real-world experience in your final year at uni can help you smash those last subjects. It could even lead to a full-time graduate position at one of the fastest-growing tech companies in the world.

As an Atlassian intern, you can spend 12 weeks working for the Australian tech company part-time, or during your summer break – specialising in software development, security, data and analytics, and more. You can also take time out for community work through the Atlassian Foundation. One team of volunteers tailored the Trello platform for Black Duck Foods' Indigenous grain network!

"Whatever your interests, there's something for you at Atlassian," says Melbourne-based associate product manager intern Aditi Venkatesh. Aditi is working as an intern part-time while finishing a Bachelor of Commerce and Computer Science at Monash University.

Product managers combine technical and non-technical skills to analyse customers' needs, identify market opportunities and collaborate with other teams on projects. This fits perfectly with Aditi's skills and interests. "I've done quite a few technical internships, but I've been looking for that one cross-functional role," she says.



ADITI VENKATESH
PRODUCT MANAGER
INTERN



[linkedin.com/in/aditivenkatesh1/](https://www.linkedin.com/in/aditivenkatesh1/)

BACHELOR OF COMMERCE
AND COMPUTER SCIENCE,
MONASH UNIVERSITY

SUMMER TRAINEE ENGINEERING
PROGRAM INTERN,
(NEXT BILLION USERS), GOOGLE

DATA SCIENTIST,
WHYHIVE

PRODUCT MANAGER INTERN
(ECOSYSTEM PLATFORM), ATLASSIAN

**IT MAKES YOU FEEL
LIKE YOUR WORK MATTERS
AND THE RESULTS ARE
IMPORTANT" SARAH TAN**

Empowering journey

Sydney-based software developer intern Sarah Tan, a Bachelor of Science (Computer Science) University of New South Wales grad, has enjoyed the opportunity to find projects she's interested in and feel like she's making a real impact.

"It's empowering. It makes you feel like your work matters and the results are important," Sarah says.

As well as honing her coding skills, Sarah has also had the chance to dabble in software engineering – by learning about the architecture of software solutions.

Leadership in action

New Zealand-based Ashley Harris started his associate product manager internship with Atlassian while studying a Bachelor of Science (Computer Science and Statistics) at The University of Auckland.

"It's a unique opportunity to launch your career. You're given a huge amount of responsibility," Ashley says.

Ashley worked on the project management tools Trello, Confluence and Jira during his internship, and now works part-time as an associate product manager.

"I get to work with different types of people in different teams, doing a variety of cool stuff," he says.

**IT'S A UNIQUE
OPPORTUNITY TO LAUNCH
YOUR CAREER" ASHLEY HARRIS**

BACHELOR OF SCIENCE
(COMPUTER SCIENCE
AND STATISTICS), THE
UNIVERSITY OF AUCKLAND

ANALYTICS ADVISORY
INTERN, EY

TEACHING ASSISTANT,
THE UNIVERSITY
OF AUCKLAND

ASSOCIATE PRODUCT
MANAGER, ATlassian



ASHLEY HARRIS
ASSOCIATE PRODUCT
MANAGER



linkedin.com/in/ashleyharrisnz/

SURPRISING SKILLS

Coding and tech skills are important, but Atlassian interns learn so much more. Here are some you might not have expected:

- **Problem-solving.** "Great ideas solve clearly defined problems," says Ashley.
- **Documentation.** "In the real world, explaining your code really matters," says Sarah.
- **Teamwork.** "We work with legal, privacy and security teams to make sure our releases are safe," says Aditi.
- **Learning from feedback.** "I presented my design to the team, got feedback and made some adjustments," says Oli.

Remote, but connected

Perth-based software developer intern Oliver (Oli) Pope says working from home as an intern during COVID-19 had its challenges initially, but he felt supported by the wider team. As many of his experienced colleagues were based in Sydney, he decided to start work earlier to have a larger crossover with the team. The bonus was, with the time difference, he had afternoons off!

Oli completed two internships with Atlassian, one in the final summer break of his Bachelor of Science (Computer Software Engineering), at Curtin University, and the second during his final year.

"I started with changes to 'readme' files and then worked my way up to complex tickets and running my own project," he says.

Oli's top tip is to set career goals for your internship.

"Talk to your manager or team leader and they can help you get there," he says.

BACHELOR OF SCIENCE
(COMPUTER SOFTWARE
ENGINEERING), CURTIN UNIVERSITY

SUMMER INTERNSHIP,
ATlassian

ASSOCIATE
SOFTWARE ENGINEER,
VGW (ONLINE GAMING)

SOFTWARE DEVELOPER
INTERN, ATlassian

Find your groove, or keep exploring!

Aditi, Sarah and Oli all had their internships extended after the 12-week program and will transition into full-time roles in Atlassian's graduate program in the coming months.

"It's definitely confirmed product management is what I want to do," says Aditi. Oli says he is keen to explore a range of skills at Atlassian. "Keep an open mind on where you want to end up. Have some fun and try different things if you're unsure."



SARAH TAN
SOFTWARE DEVELOPER
INTERN



linkedin.com/in/sarah--tan/



OLIVER POPE
SOFTWARE DEVELOPER
INTERN



linkedin.com/in/oliver-pope/

SOFTWARE DEVELOPER
INTERN, ATlassian

SOFTWARE DEVELOPER
INTERN, IBM

CO-FOUNDER, EXOLUTION
(STUDENT-LED STARTUP)

BACHELOR OF SCIENCE
(COMPUTER SCIENCE), UNSW

CAREER CONNECTIONS

For **Kirsty Penney**, a telecommunications traineeship opened the door to a rewarding career connecting Australians with high-speed mobile coverage

Kirsty Penney is as surprised as anyone that her days are filled with maths, data and engineering. “Five or six years ago I would’ve told you there’s no reason to teach maths,” she laughs. “Now, I realise it’s pretty important.”

Kirsty began studying graphic design at TAFE SA, but at the completion of her diploma, she realised that design wasn’t for her. “Studying my hobby had killed it for me,” she says.

Despite knowing “absolutely nothing” about the telecommunications industry, Kirsty decided to take a leap and give it a go after being inspired by a friend who was working in the industry.

Connecting remote Australia

Over the next two years, she gained not only her Certificate III and IV in Telecommunications Engineering Technology, but also on-the-job training installing radio equipment, learning about new and emerging technologies, and working with tools she’d never heard of before.

At the end of her traineeship, she started as a Network Design Operative with Telstra. “If you’ve heard the term ‘black spot’ before, my job is to fix those,” she explains.

Last year, Kirsty spent eight weeks in the Northern Territory, sleeping in a swag, flying drones and climbing radio towers. Her aim was to design a network that would bring high-speed mobile coverage to two remote Indigenous communities. “It’s a full day’s drive to get groceries, and their children are taught at home, so they need the internet; they need data,” says Kirsty.

Needless to say, she finds her career immensely rewarding. And she credits her traineeship for making it possible. “I didn’t have the specialist maths and I couldn’t afford to take four years off to do a degree,” she says.

“With the traineeship, I worked during the day and went home. While my friends at university were doing essays, I had none of that. And I was getting paid for the luxury of it.” – *Amelia Caddy*

KIRSTY PENNEY
NETWORK DESIGN
OPERATIVE

NETWORK DESIGN
OPERATIVE, TELSTRA

TRAINEE RADIO DESIGNER,
PROGRAMMED

CERTIFICATE III AND IV IN
TELECOMMUNICATIONS ENGINEERING
TECHNOLOGY, COMTECH

DIPLOMA OF GRAPHIC
DESIGN, TAFE SA

TOM ROSCH



YOU

US

CAN SHAPE A BRIGHTER FUTURE

Industry collaboration sits at the heart of Macquarie University's science, IT and engineering degrees. We partner with heavyweights like Optus and Cisco in the design of our degrees. And some of the biggest names in STEM – Cochlear, Microsoft, Australian Astronomical Optics and CSIRO – offer our students invaluable internships and work placements. Through passionate teaching conducted in world-leading facilities and backed by some of the biggest leaders in technology, we believe we can shape a brighter future.



How to launch a tech startup

Fancy being your own boss? If you've got an awesome idea, you could totally do an Elon Musk and create your own tech biz

Behind every big idea is a hard-working team. And right behind them? The person who started it all! If you're the kind of student who'd rather scribble down business ideas than do your homework, then you might be suited to running the show – as the founder and CEO of your own company.

But hard work isn't the only thing you'll need to launch your own idea from scratch. STEM skills are a huge plus – particularly at the start when you'll be doing a lot of the grunt work yourself. Here, we hash out what it takes to succeed in the startup game – and what subjects could come in handy. – Cassie Steel



1 LIGHT-BULB MOMENT!

Not all brilliant ideas start this way. If you're stumped, try thinking about the problems you face day to day. What would you pay money to solve? Start there and brainstorm!

2 SUSS OUT THE MARKET

What else is going on in the market? Who are your competitors? What could you be doing better? What does your audience want? Dedicate some time to market research before getting started.



3 MAKE A BUSINESS PLAN + GET SKILLED

To make a business plan you'll need to skill up in sales, marketing, budgeting, branding, building a website – and more. At school this means taking subjects like business studies, computer studies and maths.

4 SECURE FUNDING

Er, who's gonna pay to launch your biz? If it's you – you'll need to save up (and may need to keep another job until it takes off). And if it's an investor? Nailing step 3 is key.

5 DO THE PAPERWORK

Register your biz. In Oz: via the Australian Government Business and Company Registration Service. In NZ: The New Zealand Companies Office. And sign off on any agreements with partners.

6 FIND A BASE

As your business expands you might want to look into a small-scale office – even just for meetings. Got employees/clients living all over the country? Zoom, Hangouts, Teams and Slack will be your new BFFs.

7 KEEP CALM AND CARRY ON ABOUT IT

Once you're ready to roll you'll have to start executing a marketing and PR plan to get your name out there! The cheapest way to do this? On socials!

7 STEPS TO STARTING A BIZ



355,742

The number of startups registered in Australia from 2014–2019*

NO OFFICE? NO WORRIES!

HUGE businesses have started in places like...

Canva: The founder's living room
Facebook: A college dorm

Snapchat: At one of the founders dad's places

Atlassian: A teeny apartment
Uber: In a cab

HEAD START

WANT TO IMPROVE THE WAY THINGS WORK? DISCOVER THE FAST-PACED WORLD OF STARTUPS AT X15VENTURES

TO GET THERE: x15ventures.com.au

Startups are business ventures that start small and can have a big impact. Think SpaceX, Canva or The Iconic. They started out with a smart idea and transformed the way that we travel to space, create designs and do our shopping. x15ventures is a startup accelerator powered by the Commonwealth Bank of Australia (CBA). It builds, acquires and invests in early-stage startups that have the potential to transform the way the bank serves its 15 million customers. One example is helping people navigate buying a home with Home-in, a digital conveyancing service (conveyancing is the legal work involved in preparing sale documents). Home-in is now part of the CommBank app for home buyers.

WORKING AT X15

Jaime Di Laudo works as a product designer at x15. She first became interested in tech after an internship at CBA on the back of studying media at

uni. "x15 is an exciting place to be because everything is up for grabs – everyone has a role to play," she says. "It's easy to only think of the classic STEM careers, such as being an engineer or a scientist, and decide 'that's not for me', but there's so much variety, and a lot of transferable skills."

"A big part of my role as a product designer is conducting customer research interviews to ensure we're solving the right problems. Having strong communications skills from my studies has really helped with that," she says.

STAY OPEN TO OPPORTUNITY

"Even if you're not currently studying a STEM subject, a career in tech is always an option," says Jaime. She also emphasises that you don't need to have all the answers, or a map for your career.

"In high school I didn't know product design and UX (user experience) even existed!" she says. "It's hard to know what's out there, so I'd encourage people to focus on taking the first step, soaking up the experience and being open to the guidance and opportunities that will naturally emerge." – Heather Catchpole

IT'S EASY TO ONLY THINK OF THE REALLY CLASSIC STEM CAREERS. SUCH AS BEING AN ENGINEER OR A SCIENTIST, AND DECIDE 'THAT'S NOT FOR ME'

PRODUCT DESIGNER,
X15VENTURES

GRADUATE
PROGRAM, CBA

ACCOUNT MANAGER,
UBER EATS

SUMMER
INTERN, CBA

BACHELOR OF MEDIA
AND COMMUNICATIONS,
UNIVERSITY OF SYDNEY

Tech support

WISE WORDS FROM STEM GRADS WHO'VE STARTED FROM THE BOTTOM... AND NOW THEY'RE HERE!

"One of the key things about being an entrepreneur is being 100% bought into the idea that you have. You have to be so excited about the thing that you're doing. And you have to be so resilient about the fact that you're willing to take it from start to finish, no matter what it takes."

"The journey of a tech founder is a constant and difficult one, but it's also infinitely rewarding as both a learning experience and a lifestyle. It's so easy to get stuck in a rut of doing things the way you've always done them, but it's crucial in business to keep innovating, finding new and better ways to do things."

"Surround yourself with people who share the same values and whose skills you respect and need to achieve your own dreams in business. It can be a lonely journey so bring the right people along for the ride and you will be in a much better position."

LIAM RIDGEWAY
Co-founder and director of
NGNY, Indigitek & IndigiGig

Liam Ridgeway is a startup pro – he's the co-founder of Ngakkan Nyaagu (NGNY), an Aboriginal-owned digital agency; Indigitek, an Aboriginal and Torres Strait Islander tech community; and IndigiGig, a startup that links Indigenous talent in the gig-economy.

MIRIANA LOWRIE
1Centre founder

NZ-based tech founder Miriana Lowrie started 1Centre to help businesses transform their trade credit processes from costly and slow to quick and efficient. She's also super-passionate about helping more Māori women get their start in the tech industry!

KIERAN SHIREY
Managing director and
co-founder of LOGiT Australia

LOGiT Australia is an Indigenous business developing commercial software 'firsts' in-house, with a focus on the asset management (infrastructure) and engineering industries. – Cassie Steel

SO MUCH MORE TO STEM!

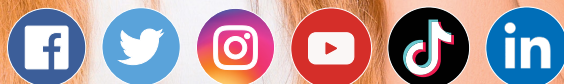
Careers with STEM is so much more than a magazine!

- Explore the jobs of the future with our **FREE Job Kits**
- Discover your **STEM** personality with online quizzes
- **Subscribe** to our yt channel for career **videos** and **webinars**
- Connect, share and reach out on **Insta** or **TikTok**!

Join 1 MILLION STUDENTS each year growing their future with STEM



CAREERSWITHSTEM.COM



Like Careers with STEM? Join us, connect with other STEM-minded peeps and widen your network before you've even graduated!



BE CONFIDENT. BE CAPABLE.
BE JOB-READY.







**Study IT at Monash – rated five stars
for graduate full-time employment***

*The Good Universities Guide, 2021-2022



MONASH
University

MONASH
INFORMATION
TECHNOLOGY

-  MonashInfoTech
-  MonashInfotech
-  Monash Information Technology
-  Monash Information Technology

CRICOS provider: Monash University 00008C. 18P-0592.

TECH FOR TECH'S SAKE

If you live and breathe technology, then a career in straight-up IT might be for you – and demand for talent is high

We talk a lot about 'STEM + X' here at Careers with STEM – that's our formula for combining science, technology, engineering or maths with your passion (+X) to find your career niche... aka dream job. But what if your passion is the T in STEM, pure and simple?

This might be you if you're the go-to tech guru in your family or friendship circle, fixing and building and helping everyone with their IT issues (when you should probably, um, be studying or doing homework). Or maybe you've been coding for about as long as you've been walking and talking? Or you've already built an app or three or designed your own game. Then a straight-up career in computer science or software engineering could be on the cards, and luckily there's plenty of demand for people with your skills and passion.



LEVINA WONG
SOFTWARE ENGINEER

START YOUR CAREER HERE

TECH+IT STUDY

Bachelor of Science (Computer Science),
University of Auckland

Bachelor of Engineering (Software Engineering),
University of Western Australia

Bachelor of Information Technology, Monash University

TECH+IT JOBS

Development operations engineer:
A\$65K–\$138K / NZ\$60K–\$126K

Software engineer: A\$56K–\$116K / NZ\$51K–\$102K

UX designer: A\$51K–\$114K / NZ\$46K–\$118K*

*Source: salaries according
to payscale.com



Check out
our **FREE**
Software
Engineering
Job Kit
at bit.ly/IT-jobkit

STUDY PATH GUIDE

HIGH SCHOOL ELECTIVES CHECKLIST

- ✓ **MATHEMATICS**
- ✓ **ENGINEERING STUDIES**
- ✓ **DESIGN AND TECHNOLOGY**
- ✓ **COMPUTING STUDIES**

VET COURSES

There are loads of VET (Vocational Education and Training) qualifications in tech – diplomas, certificates and advanced diplomas – at TAFE and polytech. Courses range from software development and programming to general IT support, cyber security, web development, interactive media and games, and more.

WHAT'S THE DIFF? COMPUTER SCIENCE VERSUS SOFTWARE ENGINEERING

Struggling to choose between computer science and software engineering – or even understand the difference? We don't blame you: there's a lot of overlap, but also some key differences.

COMPUTER SCIENCE	SOFTWARE ENGINEERING
Study computers and computer systems, and the interaction between software and hardware systems.	Design, build and test software products using engineering principles.
Focus on theories and study areas like artificial intelligence (AI), databases and programming languages.	May also be called a programmer or developer. Test and perform quality assurance checks.
May study principles of software engineering.	May have an understanding of computer science theories.



A search on job site SEEK shows literally thousands of positions for developers and programmers to apply for, with 2020 job data projecting job growth of 30% over the next five years for the field, with an average salary of \$110,000 per year. Score!

Still not convinced? Maybe you just haven't tried your hand at coding yet? If you think it sounds pretty cool – then don't dismiss this career path (did we mention the high demand and six-figure salary?).

You might be like Levina Wong, a software engineer at the Commonwealth Bank of Australia, who knew she loved problem-solving but didn't discover coding until after high school. Then, during an internship as part of her engineering degree, she got to try it and was hooked. Levina overcame her impostor syndrome and now she loves testing and building tech at the bank. "How exciting is it that so many people will actually physically see and use what I've worked on?" she says. – *Gemma Chilton*

GOOGLE GIGS

Meet 5 IT gurus smashing career goals in an exciting range of tech roles at Google

THREAT DETECTOR

IMPROVING GOOGLE'S SECURITY AND THREAT DETECTION IS ALL IN A DAY'S WORK FOR HARRISON MBUGI

Harrison's interest in information technology (IT) – and how the internet works – led him to studying a Bachelor of Computer Science, then later a Masters in IT. After taking some security classes for his Masters, his fascination for cyber security was sparked.

It wasn't until Harrison joined Google that he realised cyber security was the perfect STEM gig for him. "I had to learn more about different pathways, consult my mentors at Google and then decide which pathway to take based on what interested me the most," he explains.

And now? Harrison is kicking goals as a security engineer, where he maintains, identifies and implements ways to improve security in order to safeguard Google's information systems assets. His big picture goal is to continue to improve threat detection. One of his favourite projects has been building detection on the cloud.

WORKING IN STEM

When it comes to the STEM workplace, Harrison believes diversity introduces new experiences and ideas that can inspire creativity. "Studies have shown that diverse teams are more productive and outperform non-diverse teams," he says. "More diversity in the STEM workforce means more innovation and better solutions to the problems faced by humankind."

Harrison admits that he sometimes used to wonder if STEM was for him, but now he knows that STEM is for *everyone*. His advice? "Read about different fields and careers in STEM. Find out which one interests you the most. Look for mentors to guide you. And most importantly, don't give up." – Louise Meers



1

HARRISON MBUGI
SECURITY ENGINEER

BLACK
— Googler —
NETWORK

FOUNDER,
YOUTH
FOR AFRICA



BACHELOR OF SCIENCE /
COMPUTER SCIENCE,
ST. XAVIER'S COLLEGE (INDIA)



MASTERS IN INFORMATION
TECHNOLOGY, LOYOLA
UNIVERSITY CHICAGO (USA)



INFORMATION
TECHNOLOGY
RESIDENT, GOOGLE



SECURITY
ENGINEER,
GOOGLE

UX DESIGNER, GOOGLE

UX ENGINEER + PRODUCT DESIGN INTERN, QUORA

UX DESIGN INTERN, GOOGLE

BACHELOR OF DESIGN COMPUTING (HONOURS), UNIVERSITY OF SYDNEY

MAPPING THE WAY

INTERNSHIPS AND MENTORS HELPED **SOPHIE GARDNER** DEMYSTIFY COMPUTER DESIGN

2

SOPHIE GARDNER
USER EXPERIENCE DESIGNER

A long time ago, humans navigated the world using the Sun and the stars. Gradually, we shifted to compasses and paper maps, and today most of us rely on our phones. We've come a long way, but navigation is still changing all the time.

As a user experience (UX) designer for Google, it's Sophie's job to anticipate those changes and ensure Google Maps stays ahead of the curve.

For Sophie, UX design offers the perfect blend of creativity, sociology and technology. "I've been interested in computers since I was young, especially when it comes to finding creative ways to customise the appearance or behaviour of my devices," she says. But it was only after she studied

computer design at the University of Sydney that she realised UX design existed.

Sophie credits internships as opening her eyes to the possibilities of her field. She completed five during – and after – her studies, including two in UX design at Google. "The industry definitely felt vast and confusing when I was at school, but once I got my first internship [at Google] things became clearer," Sophie says.

Mentors have also helped guide her. "Every one of the most valuable things that I've learnt has come from mentors, and they can be anyone: teachers, other design students, managers or intern mentors," she says. – Amelia Caddy



To read about more inspiring career role models at Google, visit [CareerswithSTEM.com/googlers](https://careerswithstem.com/googlers)

3

COURTNEY HOSKIN
SOFTWARE ENGINEER

TECH SUPPORT

AS A TECH GRAD FLUENT IN CODE, **COURTNEY HOSKIN** SPENDS 9-TO-5 DEVELOPING APPS THAT CHANGE PEOPLE'S LIVES

Courtney has the dream gig as a software engineer at Google – but tech wasn't always the aim. At school the University of Canterbury grad always rated maths and science subjects, but never thought about how studying STEM could land her a forever job. In fact she headed into an engineering degree not even knowing which field she'd end up in. "I randomly took 'Intro to Computer Science' in my first year and got into software engineering from there!" she says.

After interning at a small Christchurch-based tech company and landing a part-time gig as a tutor at the same uni she studied at, Courtney gained the confidence needed to apply at one of the world's biggest companies.

"I work on sharing in Google Photos, where I'm on the iOS [operating system] team," says Courtney. "Our goal is to help people share and receive photos."

As a fan of the app from way back – "my dad always used it!" – Courtney loves how she's using her tech skills to help others curate their memories.

"I love seeing how technology is a good thing!" – Cassie Steel



BACHELOR OF SOFTWARE ENGINEERING (HONOURS), THE UNIVERSITY OF CANTERBURY, NZ

TUTOR, THE UNIVERSITY OF CANTERBURY, NZ

SOFTWARE ENGINEERING INTERN, TRESHNA ENTERPRISES

SOFTWARE ENGINEER, GOOGLE

4

BEHIND THE LENS

AS A SITE RELIABILITY ENGINEER, IT'S **JENNIFER CHENG'S** JOB TO MAKE SURE GOOGLE PHOTOS RUNS SMOOTHLY

Jennifer started out with a degree in electrical engineering at the University of NSW before deciding she was more interested in computers. "I enjoy designing and creating something I can play with, like a game or a robot," says Jennifer.

She completed two software engineering internships before landing a graduate gig at Google, where her current role is a site reliability engineer (SRE).

Jennifer works on Google Photos, improving the "debuggability" of the service, she explains.

Being an SRE is all about problem-solving, says Jennifer. For example, during some big annual festivals people are more likely to take lots of photos, so SREs like Jennifer are responsible for predicting usage, ensuring the service remains stable, and are also on-call for any urgent issues.

"My favourite thing about my job as an SRE at Google is the opportunity to work on and maintain a product on such a large scale, not only focusing on building features, but also improving the product," she says. — Gemma Chilton

JENNIFER CHENG
SITE RELIABILITY ENGINEER

BACHELOR OF
COMPUTER ENGINEERING
(HONOURS), UNSW

RESEARCH
ASSISTANT, UNSW

BACKEND ENGINEER
INTERN, CANVA

SOFTWARE ENGINEER
INTERN, GOOGLE

SOFTWARE ENGINEER
AND SITE RELIABILITY
ENGINEER, GOOGLE

RECIPE FOR CAREER SUCCESS

MARINA DELETIC'S JOURNEY INTO STEM INCLUDES ARTIFICIAL INTELLIGENCE (AI), BAKING AND A WHOLE LOT OF ENGINEERING

Marina is a customer engineer at Google – and lover of dancing, baking and artificial intelligence (AI). Engineering was the chosen career for her mother, father and three grandparents, so with that DNA it's no surprise she studied chemical engineering at uni. Perhaps what is unexpected, is that Marina also trained as a pro ballet dancer until that point.

Drawn to the fast pace of tech, Marina switched to studying data and software engineering. She graduated from Monash University in Melbourne with a dual degree – Bachelor of Chemical Engineering (Honours) and a Bachelor of Commerce. The biggest hurdle in her journey? Deciding where to go next.

"Studying STEM gives you so many opportunities for the future," Marina says. "You can end up doing so many different things because studying STEM teaches you how to think in a way that is transferable to different disciplines."

BAKING A FUTURE

Marina is currently working at Google as a customer engineer, specialising in data, AI and machine learning. She helps Google's customers create technical solutions for their business goals. These solutions include creating POCs (proof of concepts) – an experiment that tests if an idea can work in the real world.

Wondering where the baking comes in? Combining AI and tasty treats to create new recipes. The Girls Day Out in STEM Bake Off highlights the machine learning used by Marina and her co-worker Natalie Piuco – so far producing a cakie (50% cookie and 50% cake) and a breakie (50% bread and 50% cookie). — Saskia Horgan-Catchpole

5

MARINA DELETIC
CUSTOMER ENGINEER

CO-FOUNDER OF
NON-PROFIT, EDHOUR

↑

↑

↑

↑

↑

↑

↑

↑

**STUDYING STEM TEACHES
YOU HOW TO THINK IN A WAY
THAT IS TRANSFERABLE TO
DIFFERENT DISCIPLINES"**

TOP OF THE BLOCK(CHAIN)

From sociologist to entrepreneur, **Katrina Donaghy**, CEO and co-founder of Australian blockchain company Civic Ledger, has had a varied career

When blockchain found Katrina in late 2015, it changed the course of her life. "I realised that it was a very powerful technology that would have a profound impact on the way we participate in society and how economic institutions would change," she explains.

A year later, she co-founded Civic Ledger, which builds modern platforms and marketplaces with blockchain technology to solve some of the planet's most serious challenges. As CEO, co-founder and company director, she's involved in everything from culture and strategy to finance and business development.

Right now, the company is looking at how blockchain technology can improve current market mechanisms to ensure the sustainable sharing of water, particularly in agriculture.

Trust in tech

Katrina sees blockchain as an enabler to help society on an infinite number of levels. "Humans still need to be in control as technology advances, and not the other way round... So, as the digital era of the fourth industrial revolution scales, there is so much focus on trust," she says.

This means exciting career opportunities in philosophy, ethics, psychology, informatics, product development, customer experience, data and system interoperability, shifting from human reading of law to machine reading of law ("rules as code"), digital assets, decentralised finance and automation, according to Katrina. She believes that storytelling and creatives are very valuable in this space too.

KATRINA DONAGHY
CEO + CO-FOUNDER



HUMANS STILL NEED TO BE IN CONTROL AS TECHNOLOGY ADVANCES"

Anything's possible

Her advice for those who want to get into tech? Don't limit yourself. "Whether you want to work under the hood in a development role or hold technology accountable through ethics and governance, have ambitions to build your own technology company, or create beautiful applications that empower people – there are no limits to where your place will be. The only limits are when you say to yourself that you have no place." – Louise Meers

BACHELOR OF ARTS (HUMANITIES), CULTURAL POLITICS AND POLITICAL THEORY, GRIFFITH UNIVERSITY

GRADUATE CERTIFICATE IN ENTREPRENEURIAL AND VENTURE DEVELOPMENT, GRIFFITH UNIVERSITY

CO-FOUNDER, OPENCOLAB

PROGRAM MENTOR, BLOCKCHAIN RMIT ONLINE

CEO AND CO-FOUNDER, CIVIC LEDGER

GAME ON

Niamh Fitzgerald's job as a game developer combines her love of art and technology

At school, Niamh Fitzgerald says her interests were an "unusual split" between art, maths and science, and while she enjoyed playing computer games (her all-time fave is *Final Fantasy VII*) the idea of making them herself one day "didn't cross my mind".

Niamh signed up for a Bachelor of Science (Computer Science) at the University of Otago because she liked the look of their graphics department, and thought graphics programming might be a good way to combine her interests. "I found I enjoyed how it tapped into the problem-solving part of my brain," she says.

After graduating, Niamh spent a few years working in tech but then realised she wanted to explore the games industry.

Game plan

Niamh went back to uni to do a Bachelor's degree in Creative Technologies at Media Design School, which focussed on game art and design. Fast forward to the present and Niamh is now working as Development Director/Chief Operating Officer (COO) at a New Zealand games studio called Dinosaur Polo Club. She was the lead designer on their most recent game called *Mini Motorways* – a strategy simulation game about designing the roads of cities around the world while populations grow.

Niamh's advice to other aspiring game developers? Start now. "There's nothing stopping you from being a game developer right now!" she says. And diversity is crucial in the industry, she says. "It's really important to have diverse people with a variety of experiences in the room because that's how we make better games!"

– Gemma Chilton

**NIAMH
FITZGERALD**
GAME DEVELOPER

DEVELOPMENT DIRECTOR / COO.
DINOSAUR POLO CLUB

PRODUCER / CO-FOUNDER.
LITTLE LOST FOX

JUNIOR GAME DEVELOPER
INTERN. NHNZ

BACHELOR OF CREATIVE
TECHNOLOGIES (GAME ART + DESIGN).
MEDIA DESIGN SCHOOL

BACHELOR OF SCIENCE (COMPUTER
SCIENCE). UNIVERSITY OF OTAGO

IT'S REALLY IMPORTANT
TO HAVE DIVERSE PEOPLE WITH
A VARIETY OF EXPERIENCES

THE RIGHT PATH

Meet two Commonwealth Bank of Australia (CBA) grads who've been eyeing up tech careers since high school – and now they've landed dream jobs

RUHI PELIA ENTERPRISE SERVICES GRADUATE

**A LIFELONG PASSION FOR TECH LANDED
RUHI PELIA A GRAD GIG AT CBA**

Ruhi Pelia has always been interested in tech, so taking high school electives to build on her information technology (IT) knowledge was a no-brainer. She went on to study a Bachelor of Business/Bachelor of Science in IT at the University of Technology Sydney, which further fuelled her interest in technology.

Ruhi now works in enterprise services at the CBA, which runs and supports the tech for the bank – from customer products to essential tools for employees. The coolest project she's worked on so far? Creating a forecast tool that predicts the incoming work volume. This involved learning a new technical skill – scripting. Ruhi says through the project, she could see the impact she had made for her team and CBA's customers. "I was also reminded that it's never too late to learn a new skill," she says. – Louise Meers

BACHELOR OF BUSINESS / BACHELOR
OF SCIENCE (IT), UNIVERSITY OF
TECHNOLOGY SYDNEY

IT TECHNICIAN,
JTC TECHNOLOGY

ENTERPRISE SERVICES
GRADUATE, CBA

IT'S NEVER TOO LATE
TO LEARN A NEW SKILL

JACKSON ZHENG ASSOCIATE ENGINEER

**JACKSON ZHENG USES HIS TECH SKILLS
TO PROVIDE SUPPORT, INNOVATION AND
GROUND-BREAKING INSIGHTS TO
AUSTRALIA'S BIGGEST BANK**

Jackson Zheng and software engineering go way back. The CBA grad started playing around with advanced tech concepts toward the end of high school, which made picking pathways in Year 12 easy. "I was really interested in software engineering, but the hardest bit was passing my university maths subjects!" he says.

Keen to up his engineering game and try out his IT skills in the real world, Jackson applied for a graduate gig at CBA – and got it! The trickiest part? "Solving problems in situations where we don't even know if a solution exists!"

This year Jackson joined the CBA team permanently as an associate engineer and is tackling a complex automation project, while providing tech support to his team.

"I'm constructing an automated pipeline that carries and transforms data from multiple sources," he explains. "Ultimately I'm visualising the network and asset structure of the bank!" – Cassie Steel

ULTIMATELY
I'M VISUALISING
THE NETWORK AND
ASSET STRUCTURE
OF THE BANK

BACHELOR OF IT (HONOURS) /
SCIENCE (MATHEMATICS), UNIVERSITY OF SYDNEY

GRADUATE,
CBA

ASSOCIATE ENGINEER,
CBA

Create future tech

From Artificial Intelligence (AI) and automation to quantum computing, get set for the emerging fields of technology that are transforming society

The technologies included in AI – machine learning, automation and natural language processing (NLP) – are already a big part of the working world, across everything from retail to medicine. As for career options? Artificial Intelligence Specialist was #1 in LinkedIn's 2020 *Emerging Jobs Report Australia*, while Australia's top five emerging jobs feature automation or AI skills.

Quantum technology, based on the properties of materials at microscopic levels, is another emerging tech field with huge opportunities. Promising superfast computing, unhackable comms and a revolution in sensing and imaging, quantum tech offers exciting

What skills do you need to work in emerging technology?

- ✓ Collaboration
- ✓ Communication
- ✓ Being a thorough and analytical thinker
- ✓ Able to learn on the job

Interested in working in emerging technologies? Here's your high school electives list:

- Physics • Chemistry
- Digital technologies
- Design & tech
- STEM

WHAT IS MACHINE LEARNING?

Machine learning is the process where applications use data to learn. Things like: predicting stock market changes, personalising shopping experiences, analysing social trends like cyberbullying or instances of disease outbreaks, and recognising and identifying images, including facial recognition.

Natural language processing (NLP) uses machine learning to analyse, generate and even create text. NLP is also used to recognise and translate languages, and is used in services such as Google translate.

WHAT IS AUTOMATION?

Automation means making repetitive processes automatic and minimising human input into tasks – in anywhere from the manufacturing line to data entry or even housework.

What do people working in quantum technology do?

- Research fundamental physics
 - Set up and automate quantum systems
- Develop ways to move from classical computing and other technologies to quantum technologies

career opportunities in defence, mining, health, science research labs, space tech and more.

Big companies like IBM and Microsoft are looking to hire experts with the physics and engineering knowhow to get superfast quantum computing to a scale where it can start delivering to the consumer.

A May 2020 report, *Growing Australia's Quantum Technology Industry*, predicts the sector will grow into a \$4 billion industry by 2040, creating some 16,000 jobs.

– Heather Catchpole

WHERE ARE AI AND QUANTUM TECHNOLOGIES USED?

START YOUR CAREER HERE

TECH+EMERGING TECH STUDY

Bachelor of Science (Physics), QUT
Bachelor of Engineering (Honours)
(Quantum Engineering), University of NSW
Bachelor of Software Engineering in Artificial Intelligence,
Media Design School, Auckland

TECH+EMERGING TECH JOBS

Machine learning engineer:
A\$59K–\$132K / NZ\$46K–\$62K

Data scientist:
A\$62K–\$130K / NZ\$52K–\$109K

Mechanical engineer:
A\$55K–\$110K / NZ\$58K–\$115K*

*Source: salaries according to payscale.com

Social media—AI

QUT's Richi Nayak and her colleagues analysed one million tweets and developed an algorithm (a set of rules in computing) to detect tweets that are abusive towards women. Follow Richi: @nayakrichi



Health—quantum tech

Quantum sensing is already delivering dazzling apps in healthcare and medicine – such as enabling early disease detection and the imaging of human biology with exquisite precision, and helping scientists get faster at discovering new drugs to treat disease.

Health—AI

AI is used extensively for health. Coviui is an Australian telehealth platform that uses machine learning to visually recognise and analyse joint movement in patients. And chatbots help patients navigate medical bookings and information.



Defence—quantum technology

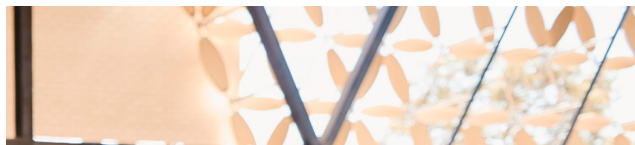
It's not just computers and comms that could benefit from quantum, according to researchers at University of Adelaide. They reckon sensors based on quantum tech could be used to track submarines or detect metal objects through solid walls.

What do people working in AI do?

- Manage data and find ways to automate processes
- Keep an eye on the ethics of AI and privacy of data
- Use data and machine learning to predict outcomes



THE UNIVERSITY OF
**WESTERN
AUSTRALIA**



Prepare for jobs of the future

Study UWA's Advanced Bachelor of Computer Science (Honours) and major in AI, Computing and Data Science or International Cybersecurity.

Through real-world industry experiences, we'll help you kickstart your career in these rapidly growing fields.

APPLY NOW:

uwa.edu.au/study/advanced-computer-science



Ones to watch

Five booming fields for the tech careers of tomorrow*

#1 ARTIFICIAL INTELLIGENCE (AI)

AI refers to developing computer systems that use big sets of data to perform intelligent tasks. AI is in demand, and it's used in everything from wildlife conservation to medical diagnosis. Popular areas within AI include machine learning, natural language processing and user experience.



#2 BIOTECHNOLOGY

Biotechnology uses cellular and biomolecular processes to develop tech that improves lives and sustainability – think vaccines, bioplastics and bionic organs. There are so many ways to combine your passion with this field. You could work in law, business or even food tech.



#3 BLOCKCHAIN

A **blockchain** is a digital ledger – that's a record of transactions or data stored on millions of computers at the same time. It can store anything from currency (shout out to Bitcoin!) to medical records. Tech giants investing in blockchain right now include Microsoft and Google, but other industries, like retail and insurance, are also seeing the benefits of it.



#4 ROBOTICS+DRONES

Robotics deals with designing, constructing and using machines to perform tasks usually done by humans. Robots can sort rice and train doctors, and they're also revolutionising healthcare, mining, manufacturing and agriculture. Oh, and their more mobile friends – drones – are helping out, too!



#5 QUANTUM COMPUTING

Wanna develop tech based on the principles of **quantum theory** (which explains the behaviour of energy and material on atomic and subatomic levels)? Get into quantum computing. Quantum computers have the potential to solve problems way faster than regular computers, and they're used in cyber security, energy, finance and logistics.



*ACCORDING TO THE THE DAWN OF THE DEEP TECH ECOSYSTEM REPORT BY HELLO TOMORROW

WELCOME TO THE FUTURE OF EVERYTHING

WANT TO WORK WITH ERA-DEFINING, EMERGING TECHNOLOGY? FROM CHEMISTRY TO COMMUNICATIONS, QUANTUM TECHNOLOGIES ARE SET TO CHANGE THE WORLD

THE WORLD OF QUANTUM PHYSICS IS CHANGING OUR UNDERSTANDING OF WHAT'S POSSIBLE"

Computers that solve certain problems 150 million times faster than current technology are just a hint of what quantum technologies are working towards. And the potential is huge for future job creation too.

Quantum technologies are any tech that harnesses the principles of quantum physics. So when you think quantum jobs you probably think of physicists – but Peter Turner, CEO of Sydney Quantum Academy (a physicist himself), says the term 'quantum engineer' is gaining traction and popularity.

Potential quantum applications include improving health outcomes with new treatments, building sensors that track changes in the marine environment, and supersensitive imaging systems. "The world of quantum physics is changing our understanding of what's possible and could fundamentally improve all technology, from sensing, through communications, to computing," says Peter. – Gemma Chilton



PETER TURNER
CEO, SYDNEY
QUANTUM ACADEMY

The Sydney Quantum Academy is a NSW Government-backed partnership between Macquarie University, UNSW Sydney, the University of Sydney and UTS, tasked with supercharging the quantum technology sector. Check out sydneyquantum.org

QUANTUM

BE PART OF THE NEXT REVOLUTION IN TECHNOLOGY

Whether your passion is in the natural sciences, mathematics, computer science, or engineering, studying quantum opens a world of possibilities.

Did you know that Sydney is home to one of the largest concentrations of quantum experts globally? Here you can learn from some of the best in the field.

Choose from a variety of quantum specialised units and courses at Sydney Quantum Academy's partner universities (UNSW Sydney, Macquarie University, the University of Sydney and UTS). They provide access to world-class facilities and expertise through their strong ties with industry leaders and national research centres.

Our programs and scholarships provide workshops, seminars, industry experience and networking opportunities to ensure you're well-equipped for an exciting career.

Find out more: sydneyquantum.org



**SYDNEY
QUANTUM
ACADEMY**



Major in tomorrow

Forget worrying about robots stealing your job – build a career in artificial intelligence (AI) and you'll be in high demand at the cutting edge of tech

TO GET THERE: bit.ly/UWA-AI

Want to gain skills that will set you up for the future of work? In a 2020 LinkedIn report on emerging jobs in Australia, every single one of the top five jobs featured skills in automation or AI.

To build a career in AI, studying a general computer science (CS) degree is an obvious choice – but there is also an increasing number of dedicated AI degrees and majors that will see you graduate with targeted skills in this hot field of tech. For example, the Bachelor of Advanced Computer Science (BACS) at The University of Western Australia (UWA) has an option for undergrads to major in AI.

Tech + philosophy

According to Associate Professor Rachel Cardell-Oliver, Head of Computer Science and Software Engineering at UWA, students who choose the AI major will not only study

fundamental CS (think databases, programming and networks), but also cool AI-specific topics such as philosophy and ethics, machine learning and natural language processing.

"BACS AI graduates will be prepared to go into startups and cutting-edge AI companies or continue building their expertise through research at UWA," says Rachel, who is a UWA alumnus herself.

Hashim, who is currently enrolled in the BACS course, says he chose UWA because it is one of Australia's only leading universities offering an AI major with an Honours degree in Computer Science.

"I really like the units about philosophy and ethics and the use of AI and modern technologies. Students should learn about the dangers of technology if not used ethically," he says.

Rachel says AI has the power to achieve new insights and change the way we work, and that there is a surge of interest in AI in a huge range of fields, including astronomy, medicine, business and the environment.

"Graduates of BACS AI have the opportunity to make a real difference in the world, and to do so at an early stage in their career," she says. – Gemma Chilton



**RACHEL
CARDELL-OLIVER**
HEAD OF COMPUTER
SCIENCE AND SOFTWARE
ENGINEERING, UWA

**GRADUATES HAVE THE
OPPORTUNITY TO MAKE A REAL
DIFFERENCE IN THE WORLD AND AT
AN EARLY STAGE IN THEIR CAREER"**

REINVENTING SCIENCE WITH TECH

JON WHITTLE, DIRECTOR OF CSIRO'S DATA61, SAYS TECHNOLOGY IS CHANGING HOW WE DO TRADITIONAL SCIENCE, AND DIGITAL SKILLS WILL BE CRUCIAL



JON WHITTLE
COMPUTER SCIENTIST

WE KNOW THE WAY WE DO SCIENCE WILL LOOK VERY DIFFERENT IN 20 YEARS' TIME"

Jon Whittle is the director of CSIRO's Data61, and a world-renowned expert in software engineering and human-computer interaction. In his lifetime, Jon has seen technology undergo enormous change – from his early interest in designing video games as a teenager in the 1980s to today. The evolution of tech continues at a breakneck pace, and it's changing the way we do science.

"We know the way we do science will look very different in 20 years' time. Technologies such as artificial intelligence (AI) are creating new possibilities and allowing us to speed up the process of scientific discovery," says Jon.

Being fluent in tech will therefore be important for the scientists of the future. "All of this will be underpinned by digital skills, so data science and knowing how to properly and ethically incorporate technologies such as AI into scientific methodologies will be increasingly important," he says.

But Jon stresses that the fundamentals of science – and being a scientist – will stay the same. "While these technologies will create new opportunities, the most important aspect will always be the deep scientific knowledge and judgement of the human scientist at the centre." – *Gemma Chilton*

DATA61 IS THE DATA AND DIGITAL ARM OF AUSTRALIA'S NATIONAL SCIENCE AGENCY, FACILITATING COLLABORATION BETWEEN RESEARCHERS, INDUSTRY AND STUDENTS.

"AT CSIRO, WE HAVE MORE THAN A THOUSAND RESEARCHERS WORKING ON A RANGE OF PROJECTS, LIKE LOCATING DISEASE-CAUSING GENES AND PROTECTING OUR ENVIRONMENTS," SAYS JON.



digitalcareers

Do you want to build robots for a living?

What do artificial intelligence and robotics have in common? They are the future.

And, have you ever thought about how AI can help with the problems we don't know how to solve?

If yes, then you'll need computational thinking skills.

We can help you

Enhance your computational thinking skills by signing up for the 2022 Bebras challenge.

digitalcareers.csiro.au/Bebras



CSIRO Australia's National Science Agency

People power

Want to make a difference?
Use your tech skills to build a better world

If you're passionate about social justice, you might be considering a career in social work, or working for a charity or aid organisation – but have you thought about combining your wanna-help attitude with technology skills for a career that can make a real difference?

“Technology and data are helping to fuel an unprecedented movement for social justice all around the world,” says Tal Frankfurt, founder and CEO of Cloud For Good (a transformational tech company), quoted in a *Forbes* article last year.

That article looked at the power of tech to aid social protests and social movements, like Black Lives Matter. But tech for social good is about more than harnessing the power of social media, or hashtag activism.

Passionate about the environment? You could build an app like Greener, which rewards consumers for shopping more sustainably. Or is inclusivity and disability advocacy more your jam? You could be involved in a project like building the StorySign app, launched by tech company Huawei in 2019 to enrich story time for hearing-impaired children and their parents.

The opportunities are endless, if you've got the drive to make a difference. “Ultimately, technology is neither good nor bad on its own. It's a tool, and what matters is how we use it,” says famous tech philanthropist Melinda Gates.

RANDOM HACKS OF KINDNESS

Ready to use tech for good starting, like, yesterday? You don't need to be working for a big tech company or start your own business. Hackathons are a great way to practice using tech for good.

Check out Random Hacks of Kindness (RHOK), which runs twice yearly hackathons in Melbourne, Brisbane and Sydney. They work with charities, entrepreneurs and non-profits to help solve challenges over a 48-hour hackathon involving volunteer hackers, technologists, designers and creative thinkers. To date they've tackled a diverse range of social problems, from bushfire response to inspiring more girls to get into tech, and from mental health to the environment.

Visit rhokaustralia.org to sign up or find out more.

START YOUR CAREER HERE

TECH+SOCIAL GOOD STUDY

Bachelor of Information Technology, Monash University
Bachelor of Science (Computer Science), University of Canterbury
Bachelor of Engineering (Computer and Software Systems), QUT

TECH+SOCIAL GOOD JOBS

Software developer: A\$51K–\$101K / NZ\$50K–\$92K
Project manager, IT: A\$65K–\$162K / NZ\$58K–\$118K
Web app developer: A\$52K–\$112K / NZ\$49K–\$87K*

*Source: salaries according to payscale.com



3

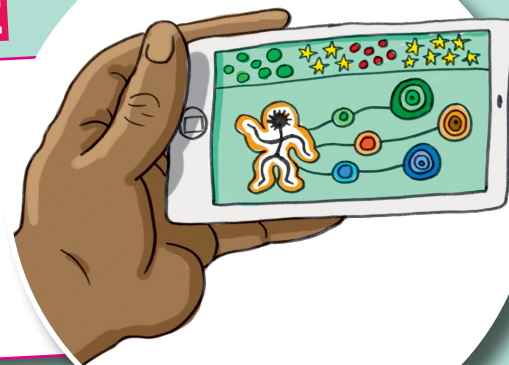
APPS MAKING A DIFFERENCE IN DIFFERENT WAYS

WHETHER IT'S FIGHTING POVERTY, HELPING THE ENVIRONMENT OR SUPPORTING MENTAL HEALTH, THERE ARE LOADS OF DIFFERENT WAYS TO MAKE A DIFFERENCE WITH TECH. HERE ARE 3 AWESOME APPS TO GET YOU INSPIRED

1

SUPPORTING YOUNG INDIGENOUS PEOPLE

iBobbly is a social and emotional wellbeing app designed by and for Aboriginal and Torres Strait Islander peoples. The app supports mental wellbeing by drawing on stories, images and videos from Aboriginal artists and performers, showing ways to manage thoughts and feelings, set goals and focus on what's important.



2

EMPOWERING REFUGEES WITH TECH SKILLS

IMPACT is a program developed through the United Nations World Food Programme Innovation Accelerator. Partnering with major tech firms, it empowers refugees by equipping them with the digital skills needed for a brighter future.



3

FIGHTING FOOD WASTE

Developed in Denmark and used across Europe, the **Too Good To Go** app connects customers to businesses with excess food to prevent waste – 88.4 million meals have been saved since the app was launched in 2016! Users get meals at a great price, businesses reach new customers and reduce waste, and less food goes into landfill.



And whether you want to launch a tech startup (check out page 12 for tips and inspo) or you dream of landing a gig with a tech giant, your tech future will have opportunities to do good.

For example, Google has the Google.org Fellowship, a pro bono program that matches its employees with non-profits and other civic entities for up to six months on full-time projects. Atlassian, whose Aussie founders are famously civic-minded, has the Atlassian Foundation and its employees receive up to five days of volunteering leave every year.

You could also start to stretch your tech + social good muscles before you even leave high school. Hackathons like Random Hacks of Kindness (see box) recruit volunteers to help use tech to solve some of society's most pressing challenges. – *Gemma Chilton*

JOSEPH SINCLAIRAPP DEVELOPER/
COMPUTER SCIENCE
UNDERGRAD

DOING GOOD BETTER

Meet two students combining their love of technology with their passion for making the world a better place

Looking for a uni with a conscience?

Monash University's Faculty of IT is leading more than 200 projects under its 'IT for Social Good' mission – from lifesaving artificial intelligence to inclusive tech for people with vision impairments. Find out more at bit.ly/MonashSocialGood

TECH TO PLATE

JOSEPH SINCLAIR HASN'T EVEN GRADUATED BUT HE'S ALREADY DEVELOPED A POPULAR APP THAT'S IMPROVING ACCESS TO FRESH FOOD DURING THE PANDEMIC

The inspo for Sprout came while Joseph was in New Zealand using honesty boxes to share homegrown produce. While studying a Bachelor of Computer Science at Monash University, Joseph developed the digital platform to allow people to share their excess produce, whether they want to sell, buy or swap.

"I just wanted it to be a way for people to share their fresh food and help local communities," he says.

Having launched the app at the start of the COVID-19 pandemic, Joseph didn't predict the added benefits. "Sprout helped reduce

the number of people needing to do their grocery shopping in public places. Lockdown also created an increase in new home gardeners," he says. Sprout has been downloaded more than 3000 times, and Joseph was a Tech Visionary Award Finalist for the 2021 7News Young Achiever Award. That's growing good.

I JUST WANTED IT TO BE A WAY FOR PEOPLE TO SHARE THEIR FRESH FOOD"

DRIVING DIVERSIT

IT AND ARTS UNDERGRADUATE LALITHA POLAMRAJU IS PASSIONATE ABOUT INCREASING DIVERSITY IN TECHNOLOGY AND STEM

Lalitha Polamraju loves language and is excited about the prospect of a career in cyber security, so she signed up for a degree in IT and Arts at Monash University.

When she's not studying or taking part in cool events like security hackathons, she's also the student co-lead on the Monash diversIT team, an initiative that aims to support under-represented students in the IT community.

"This year, we asked, 'How do we increase diversity in IT beyond the university?'" she says.

Their answer? Talking to high school students. "I'm working with our entire committee to curate and present workshops at high schools," Lalitha says.

"I think this project is taking us one step closer to our mission to inspire under-represented students to pursue IT, and by extension, STEM."

"The inherent beauty of variety is not considered enough," she says.

LALITHA POLAMRAJU

IT/ARTS UNDERGRAD



THE INHERENT BEAUTY OF VARIETY IS NOT CONSIDERED ENOUGH"

BACHELOR OF IT AND ARTS.
MONASH UNIVERSITYPROGRAMMING BOOTCAMP FACILITATOR.
MONASH UNIVERSITY FACULTY OF ITCO-LEAD, DIVERSIT.
MONASH UNIVERSITY

Change champion

Kimberly Valenny is empowering the next gen of women in tech to chase goals and smash stereotypes

Kimberly's motivation to study Information Technology (IT) came from looking around her high school IT class. "Of 16 students, I was the only female," she explains. "That made me even more determined to get it done and do it right!"

Now she's in her fourth and final year at QUT in Brisbane, studying a double degree in IT and Creative Industries, with majors in Computer Science and Interaction Design.

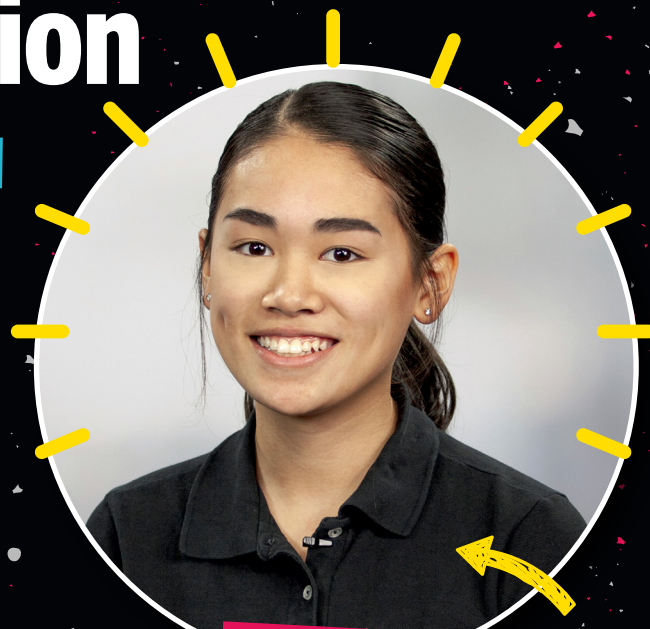
Still passionate about equality in tech, Kimberly is the president of the Women in Technology (WIT) student club, which welcomes anyone with a common aim to unite, inspire and empower women studying and pursuing all sorts of tech fields.

This year, WIT hosted a Women in STEM Industry Night. The event provided students with insights into the importance of gender diversity in STEM as well as the significant roles women play in the industry. "My favourite part was seeing all the connections made between students and companies from the industry," Kimberly says.

It was a full-circle experience for her too. Two years prior, at the same event, Kimberly connected with Deloitte representatives and scored herself an internship in their digital team. She'll also be returning there in 2022 as a graduate.

And when she's not at uni? Kimberly works at Code Camp, teaching primary school students how to create their own games using drag-and-drop coding. "If students can understand the programming logic and design considerations behind technology while in primary school, then the future is in great hands," she says.

When it comes to tackling hurdles for women in tech, Kimberly believes it's important to find your STEM tribe. "When you surround yourself with people who will support you and have been in your shoes before, you gain a feeling of confidence you wouldn't have found anywhere else." – Louise Meers



KIMBERLY VALENNY
PRESIDENT OF WOMEN IN TECH

**WHEN YOU
SURROUND YOURSELF
WITH PEOPLE WHO
WILL SUPPORT YOU...
YOU GAIN A FEELING
OF CONFIDENCE"**

BACHELOR OF INFORMATION TECHNOLOGY / CREATIVE INDUSTRIES, QUT
PRESIDENT, WOMEN IN TECHNOLOGY AT QUT
TUTOR, GIRLS PROGRAMMING NETWORK
AREA COORDINATOR AND HEAD TEACHER, CODE CAMP
UNDERGRADUATE INTERN, DELOITTE DIGITAL
FACULTY STUDENT AMBASSADOR AND SESSIONAL ACADEMIC, QUT

TALK THE TALK

Tech entrepreneur **Matt Leete** combined engineering and design to create a tool for gamers living with impaired speech



Growing up, Matt Leete says he always loved creative problem-solving and wanted to be an inventor. He has “always been deeply curious about technology”.

Matt enrolled in a degree in Aerospace Engineering at the University of Queensland, but after two years he transferred to a Bachelor of Integrated Product Design at the University of Technology Sydney (UTS). Matt followed his degree up with a Masters of Interaction Design at the University of Sydney, focussing on electronic arts and human-computer interaction.

It was while working on a hackathon called the Remarkable ‘Enabled by Design-athon’, organised by the Cerebral Palsy Alliance in partnership with UTS, that Matt came up with the idea for Spix App.

“Our problem statement was to make online gaming and e-sports more inclusive for people with a disability,” explains Matt. “I spent the week speaking with gamers with a range of disabilities. Some common themes emerged, especially relating to the challenges with existing communication tools.”

Path to success

Matt’s solution? Spix App – a desktop app that allows users to prerecord common gaming phrases,

edit the sound of their voice if required, then trigger the voice clips with the click of a button.

“It supports gamers with impaired speech in fast-paced competitive gaming, or in complex online socialisation,” Matt says.

A winning formula

Matt’s Spix App idea was one of three winners of the Remarkable Design-athon, and it is now being tested and prepared for market as part of the Remarkable accelerator program.

Matt says his study and career path meant he was well equipped to launch the Spix App. “I’m comfortable with technology, and could write enough code to develop the early prototypes of Spix App,” he says.

Making the tech world more inclusive for people with a range of abilities is a big focus right now, says Matt. “It is an incredibly interesting area to work in and I would 100% recommend it to people looking for the opportunity to have a real impact on people’s lives.” – Gemma Chilton



MATT LEETE
PRODUCT LEAD + FOUNDER

OUR PROBLEM STATEMENT WAS TO MAKE ONLINE GAMING AND E-SPORTS MORE INCLUSIVE FOR PEOPLE WITH A DISABILITY”

BACHELOR OF INTEGRATED
PRODUCT DESIGN, UTS

MASTER OF INTERACTION DESIGN AND
ELECTRONIC ARTS, UNIVERSITY OF SYDNEY

PRODUCT LEAD + FOUNDER,
SPIX APP

Code, clubs and community

Jennifer Halvorsen's software skills are helping businesses improve health and environment programs

Jennifer Halvorsen always loved playing computer games, but technology and engineering was never really advertised at her high school.

"I originally wanted to get into gaming," Jennifer says. "That sparked an interest in learning more about computers and other areas of software. From there it was a toss-up between picking computer science or software engineering."

Software engineering won, and Jennifer took up a degree at the University of Canterbury (UC). She now works as a junior developer at Mango Limited, a company that helps businesses around the world improve their quality, health and safety, and environmental management programs.

SOFTWARE AND SOCIALISING

The degree at UC has a strong emphasis on project work, which showcases how software is much more than just

JENNIFER HALVORSEN
SOFTWARE ENGINEER

DON'T BE AFRAID TO FAIL

coding. In her third year, Jennifer had a full-year team project where she worked closely with her peers to design, develop and test an organ donation system.

"I made some great friends out of it!" she says.

The social side of studying also formed from clubs.

"I was involved with both WITsoc (Women in Tech Society) and CompSoc (Computer Science Society). Both clubs are a great way to meet and socialise with others."

A mix of casual get-togethers, industry events and tutorial sessions created a safe space to connect.

"Getting involved with the wider community through clubs is a great way to make friends and have support while studying," she says.

A STRONG START

From the wide variety of courses, Jennifer enjoyed computer graphics most. "When pieces of code were in the wrong place you would end up just sitting there laughing at it because the models looked so ridiculous," she says.

Part of the degree at UC includes an internship. Jennifer did hers at Seequent, developing new features for 3D modelling software. "Interning at Seequent definitely helped me in starting a career after my studies – it gave me real-life experience with common development processes that I continue to use in my current career, and helped me gain confidence that I was good at problem-solving."

Her advice? "Don't be afraid to fail."

"In my early years I was often afraid of failing and it held me back," she says. Now Jennifer looks at failing as one of the best ways to learn. – Sarah Kellett

JUNIOR DEVELOPER,
MANGO LIMITED

SOFTWARE ENGINEERING
INTERN, SEEQUENT

BACHELOR OF ENGINEERING WITH HONOURS
(SOFTWARE ENGINEERING), UNIVERSITY OF CANTERBURY

The law of averages

You may not get a starring role in legal drama *Suits*, but you can have an awesome career in tech law. Not familiar? Read on

SPECIALIST
TECHNOLOGY
LAWYER. UTS



SENIOR LAWYER / TECHNOLOGY
MEDIA TELECOMMUNICATIONS AND
PROJECTS. GILBERT + TOBIN



SOLICITOR. SOUTH WEST
SYDNEY LEGAL CENTRE



BACHELOR OF ARTS /
BACHELOR OF LAWS.
UNIVERSITY OF SYDNEY



BACHELOR OF ARTS /
BACHELOR OF LAWS.
UNIVERSITY OF SYDNEY

BACHELOR OF ARTS /
BACHELOR OF LAWS.
UNIVERSITY OF SYDNEY

Lucille Hughes doesn't have a computer science degree – in fact she jokes that for a technology lawyer she can find it tricky sorting out her own tech sometimes – but that hasn't stopped the specialist technology lawyer and in-house counsel at the University of Technology Sydney (UTS) from being ace at her job.

Lucille always knew she wanted to go to uni, but it wasn't until Year 9 that she started to think about studying law. However, Lucille says, the concept of a tech lawyer didn't really exist the way it does now, so it wasn't an option.

Fast forward to a move overseas and Lucille accepted a role working in-house for local government, where she was “immediately thrown into the deep end working on IT contracts,” she says.

On her return to Australia, all that unexpected legal experience in IT – plus her dual qualifications to practice law in NSW and the UK – helped Lucille score sweet roles in banking, at a big law firm, and now, her current position at UTS.



LUCILLE HUGHES
TECHNOLOGY LAWYER

START YOUR CAREER HERE

TECH+LAW STUDY

Bachelor of Mathematical and Computer Sciences /
Bachelor of Laws, University of Adelaide

Bachelor of Science in Information Technology /
Bachelor of Laws, University of Technology Sydney

Graduate Certificate of New Technologies Law,
Australian National University

TECH+LAW JOBS

Legal compliance manager: A\$73K–\$150K /
NZ\$61K–\$147K

Systems analyst: A\$56K–\$108K / NZ\$50K–\$97K

Corporate lawyer: A\$58K–\$149K /
NZ\$46K–\$177K*

*Source: salaries according to
payscale.com

**TECHNOLOGY
HAS REALLY
DISRUPTED THE
LEGAL SECTOR***



THE RISE OF DIGI-LAW

Tech law has become a key practice area for legal firms, Lucille says. “Technology has really disrupted the legal sector. It has changed the type of work lawyers do and the way lawyers deliver services to their clients.”

“The technology tools and platforms available to lawyers now mean that legal services can be delivered from anywhere to anywhere in real time,” she says.



LEGAL AID

For example, Melbourne company SettlePro is working on a prototype of online calculators, due for release next year, that will help family lawyers fast-track property settlements. And Sydney-based Smarter Drafter has 96 different automated legal documents for firms and clients to choose from to help businesses with their legal needs in a post-COVID-19 world. These tech-focussed platforms are changing the way lawyers get the job done.

There's also the Australian Legal Technology Association, offering a community vibe for sharing info and collaboration for organisations in the legal space to help fund, understand and use tech, both here and on a global scale.

"APIs (application programming interfaces) have been major game changers for organisations," Lucille says.

Automating legal proceedings also means courts can make rulings more efficiently. The Federal Court of Australia states that eLodgements make the court more accessible to everyday peeps. For example, it estimates the need for physical hearings in the 2019 Victorian Bushfire Royal Commission were reduced by 25% thanks to the docs being accessed via an electronic platform.

Social law

Tick these toks for fun legal insights with a side of lip-syncing:

@legaltechbro
@verylawyer
problems

WHO'S HIRING?

Big Data companies, startups, banks, insurance groups, telecoms and the public sector all rely on tech law, says Lucille. They also need a good understanding of their legal obligations in areas such as policy and regulation, so there's work to be done there, too.

Even though Lucille didn't set out to be a tech lawyer, her advice is, "go for it! The skills are transferable globally and you get to work with some amazing people. Always be curious and interested in what lies around the corner." – Pippa Duffy

DISCOVERY

(IT'S A LAW TERM...
LOOK IT UP!)

HERE'S WHERE TO TAP INTO
THE TECH + LAW SPACE...



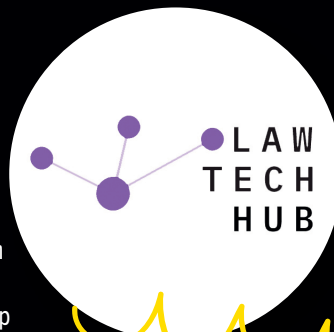
The College of Law

Run by pros from all over the world, The College of Law offers a Legalpreneurs Lab, collab and research opportunities, and expert guidance.
bit.ly/COLaw

LawTech Hub

The Lander & Rogers LawTech Hub offers up programs to help develop the big ideas.

Their "Indigenous Startups" focuses on supporting Indigenous communities and businesses. bit.ly/LawTechHub



Checkbox Certification

Work in the real world with real clients to test your knowhow on projects and up your no-code skills at the same time. bit.ly/CBoxCert

Checking the right boxes

Despite having a law degree, **Evan Wong** isn't a lawyer. He's a self-confessed techpreneur

When Evan Wong graduated from the University of NSW with a combined degree in commerce and law, he was never destined for duking it out in a courtroom. Instead, he honed his love for passing on knowledge to found Hero Education, a tutoring and support service for high school kids.

Almost 11 years later, Evan – along with James Han and Paul Wenck – has co-founded another company, this time applying tech in the legal world.

Checkbox, a no-code automated software platform, kicked off in 2016. The company's aim? To provide a tech edge for legal teams – allowing them to build their own programs, develop workflow and generate documents – with zero coding required.

"After facing the challenge firsthand, I wanted to make legal and compliance content more dynamic and streamlined – that's how Checkbox started," Evan says. "The idea to launch Checkbox was to solve a problem. A lot of the problems today are solved through technology. At Checkbox we empower lawyers and legal teams to build their own software," he explains. "They use drag and drop techniques to build tools that help them automate manual work. So, when you think



EVAN WONG
CO-FOUNDER + CEO



about things like wills, non-disclosure agreements or service agreements... everything is built without coding."

Lawyers have a limited amount of time, and they can be exxy if you need to engage one, says Evan.

Checkbox means organisations don't have to think about training up their lawyers in coding programs like Python and JavaScript. Instead, they can automate a lot of their work and roll out their solicitor skills in a more effective way, on a larger scale – keeping clients happy and providing a better experience all round.

A LOT OF THE PROBLEMS TODAY ARE SOLVED THROUGH TECHNOLOGY

Checkbox also works with companies like Coca-Cola and PWC to enable them to build systems to streamline work for their internal legal teams: as well as non-for-profits, where pro bono lawyers are able to provide their services to more people on a larger scale.

As for jobs... legal technologists, legal engineers and legal operations managers are on the rise. "There are so many different career pathways," Evan says, so it's an exciting time to be involved in the law. "It's also an exciting time to be in tech. There's such a powerful marriage between the two." – Pippa Duffy

BACHELOR OF COMMERCE / BACHELOR OF LAW, UNSW

FOUNDER, HERO EDUCATION

CO-FOUNDER + CEO,
CHECKBOX

LEGAL HACKING

IT'S **SOPHIE KAE LIN**'S JOB TO ETHICALLY HACK INTO WEB APPS AND DEVICES TO UNCOVER VULNERABILITIES

Out of high school, Sophie signed up for a Bachelor of Information Technology (IT) at Macquarie University in Sydney because she was always interested in technology and – although she had zero experience in coding at the time – she was fascinated to learn more.

Sophie initially coupled this with a Bachelor of Law, but found herself spending much more time on her IT subjects, so switched to a single IT degree. “There were so many fun and interesting subjects, I didn’t want to miss out on any,” she says.

Battling imposters inside and out

Speaking of interesting subjects – Sophie chose to major in cyber security for her IT degree. “Knowing people who have been victims of social engineering and hearing about other cyber attacks furthered my interest,” she says.

Having no coding experience meant Sophie felt some imposter syndrome, but her time at uni soon helped overcome this. “Tech is a difficult field to be in because there is so much to learn and cyber attacks grow and change every day,” she says. “You have to be comfortable in accepting that you don’t and never will know everything.”

After graduating, Sophie interned at Google, worked as a research assistant and sessional tutor at Macquarie Uni, and then landed her current gig – as a cyber security consultant at global professional services company, EY.

YOU HAVE TO BE COMFORTABLE IN ACCEPTING THAT YOU DON'T, AND NEVER WILL, KNOW EVERYTHING

SOPHIE KAE LIN
CYBER SECURITY CONSULTANT

Making – and breaking – tech

Working as a penetration tester or ‘pen tester’ in EY’s Red Team, it’s Sophie’s job to ‘hack’ web or mobile apps and devices to uncover vulnerabilities. “That information then gets passed on to the application’s developers so they can fix any vulnerabilities that make them susceptible to a real-life scenario,” she explains. “Because I’m still learning, my average day involves performing research on popular attacks to discover new ways of exploiting applications.”

Sophie says her uni studies come in handy every day in her job. “A lot of my degree involved building applications and software. All that learning has helped me in my current role.”

And even though Sophie never finished the law degree, the law is still relevant in her work in cyber security. “I have to consider a lot of compliance legislation,” she explains. “It’s also helpful to think about the legal ramifications of cyber attacks for context when testing.” – Gemma Chilton

BACHELOR OF IT (CYBER SECURITY),
MACQUARIE UNIVERSITY

INTERN, GOOGLE

RESEARCH ASSISTANT,
MACQUARIE UNIVERSITY

CYBER SECURITY
CONSULTANT, EY

Jobs in Retail 2.0

It's not all customer service and slick merchandising. To secure a next-gen role in retail, you'll need tech skills – and lots of them

Shopping for a secure, tech-focused career? With new technologies shaking up the way we make purchases, retail is now one of the fastest growing areas in tech. Here's where it's growing, what employers are looking out for, and why. Sweet staff discounts aside, it's such a cool industry to get into.

Careers for sale

Sure, traditional retail roles are still relevant, but as major brands reduce store numbers and invest in digital integration, there's mega demand for tech talent to lead their teams. Next time you're doing a job search, make sure you include the following next-gen retail roles. – Cassie Steel

SOFTWARE DEVELOPERS

Software developers are up there with one of the fastest growing jobs in retail – demand is up by 9% from last year. Frontline responsibilities include creating ecommerce sites and developing digital warehouse control systems.

Skills/experience: Fluency in programming languages like Java, ReactJS and Oracle Retail. Computer science degree or diploma is a plus.

#1

#2

USER EXPERIENCE (UX) DESIGNERS

While future-focused retailers rely on customer-facing applications and websites, UX designers are busy behind the scenes making sure platforms are user friendly, intuitive and engaging. Popular shoppable apps today – think The Iconic, ASOS and eBay – act as mini digital stores, with a UX Designer (aka next-gen floor manager) ensuring they're seamless.

Skills/experience: Prototyping, wire-framing and an eye for what looks good.



#3

BLOCKCHAIN DEVELOPERS

As one of the most-searched crypto jobs in Google, Blockchain gigs aren't just reserved for managing bitcoin. In fact blockchain developers are responsible for creating systems for recording all types of secure digital and data transactions, including those made via digital wallets in ecommerce stores.

Skills/experience: Working with large code bases and knowledge of common algorithms and data structures.



#4

DATA ANALYSTS

Retailers have always been awesome at capturing data, but now they're putting tech teams with analytics skills to use. According to predictions by International Data Corporation, this year more than 900,000 jobs will require data management and interpretation skills – many in customer analytics – directing shopping data to identify paths to purchase.

Skills/experience: Super-strong maths, analytics and data-mining skills. A love of shopping wouldn't hurt either!

START YOUR CAREER HERE

TECH+RETAIL STUDY

Graduate Certificate in UX and Web Design,
Torrens University Australia

Bachelor of Information Technology,
The University of Newcastle

Bachelor of Creative Technologies,
Auckland University of Technology

TECH+RETAIL JOBS

Software developer:

A\$51K–\$101K / NZ\$50K–\$92K

UX designer: A\$52K–\$108K / NZ\$47K–\$101K

Digital strategist: A\$50K–\$147K /
NZ\$50K–\$160K

*Source: salaries according to payscale.com

Buy one get one free

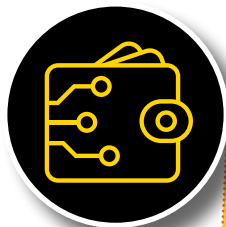
STEM skills are transferable – which means you can apply them to loads of different industries and jobs – and that includes gigs in eTail! Getting clued up in ecommerce could allow you to dabble in cyber security and cryptocurrency roles eventually, too.

IN STOCK

SO, WHAT COOL TECH ARE NEXT-GEN RETAILERS PLAYING WITH INSTORE? WE'RE GEEKING OUT OVER THE FOLLOWING...

DIGITAL WALLET

Wanna be able to make multiple purchases without having to recite your account deets again and again? Digital wallets are software-based systems that store a customer's payment credentials and passwords. In Australia the growth for retailers is huge. According to the Commonwealth Bank of Australia, the number of monthly digital wallet transactions increased by 90% in the last year alone.



MOBILE PAYMENTS

We use our phones for everything, so why not pay for stuff with them too? New mobile tech allows shoppers to enter their credit card deets into an app and turn their phones into virtual debit cards.



AFTERPAY

Buy now and pay later! The concept of Afterpay is simple – but the tech is complex. Afterpay uses its own data to approve customers on a sale-by-sale basis to decide whether or not to approve instalment payment terms for them.



I DIDN'T FIND MY LOVE OF TECH UNTIL THE SECOND SEMESTER OF FIRST YEAR

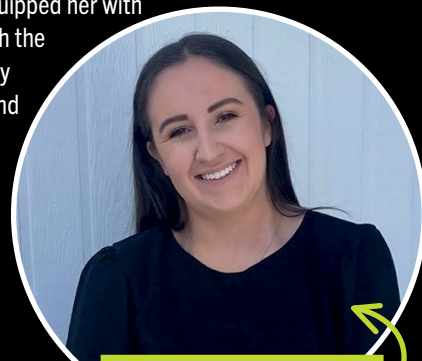
FROM THE MALL TO A FIREWALL

EX-STORE MANAGER LEAH GRANT-MOORE IS KICKING GOALS IN RETAIL 2.0

At high school Leah Grant-Moore always favoured science and maths, but didn't look into the 'T' in STEM until she was at uni. She enrolled in a Bachelor of Commerce at the University of Wellington, fell in love with computer science and decided to major in information and systems management.

"I didn't find my love for tech until my second semester of first year," Leah stresses. "It was honestly the best change I made!"

A part-time gig in retail equipped her with a great understanding of both the shop floor and the technology needed to keep it running. And now? She's a service desk analyst working for an awesome NZ-based, next-gen retail company.



LEAH GRANT-MOORE
SERVICE DESK ANALYST

CLICK AND CAREER

Leah's employer is AdvanceRetail – a cutting-edge software business that meets the technology needs of big-deal online stores! The ex-retail manager spends 9 to 5 looking after clients in the Asia-Pacific region, solving their problems and assisting with large-scale rollouts.

"I've always worked very closely with customers in my previous in-person retail jobs, so it's good to still be able to do that and build relationships with our customers," she says.

With a focus in areas like app development, inventory management, customer service and supply-chain processes, there are definitely challenges when the customers aren't face to face. "With tech retail you don't always have an answer for a customer straightaway! There's a lot of troubleshooting and behind-the-scenes work," says Leah. – Cassie Steel

SERVICE DESK ANALYST,
ADVANCE RETAIL

BACHELOR OF COMMERCE, MAJORING IN INFORMATION
SYSTEMS AND MANAGEMENT, UNIVERSITY OF WELLINGTON

STORE MANAGER,
BUNNINGS

WANNA WORK IN TECH? START HERE!

Resources for wherever you
are on your tech journey

At school

A future tech career starts with what you learn at school, so pay extra attention in maths and science. When you can choose electives in Year 11 and 12, think about the ones that will help you land your dream job:

- Applied information technology
- Computer science
- Design and technology
- Digital solutions / technologies
- Engineering studies
- Information and processes technology
- Software design and development

Also see if your school has an after-school coding club. Have a look at codeclubau.org and codecamp.com.au for more deets.



On the weekend

Tech experts always stay on top of the latest developments in their industry. Get into this mindset even before you have the gig with some at-home learning.

Wanna be a game developer?

Keep your eye out for comps like the Australian Video Game Challenge: stemgames.org.au

Keen on computer science?

Learn it in 1000 YouTube videos thanks to the clever peeps at Laconic Machine learning: bit.ly/learn-CS-YouTube

How about cyber security?

The Australian Computing Academy has a bunch of free challenges over at aca.edu.au/resources

Get your code on

Level up your coding skills! There are so many brilliant resources out there to help you out. We've made a big list of them on the Careers with STEM website: bit.ly/cws-coding-resources

And here are three fun ones to get you started:

- 1 Try scratch.mit.edu for a simple, free block coding program
- 2 Access hours of coding activities at code.org/learn
- 3 Learn how to develop in Swift (Apple's programming language) with Swift Playgrounds: apple.co/3gsjthV

Grab a uni degree

Speak to your uni of choice to make sure you're choosing the right tech course for you – the content of a computer science degree will be slightly different to information technology (IT), and not the same as software engineering. And the tech education landscape is always changing – for example, several universities are now offering degrees in artificial intelligence and cyber security.

You may also want to combine your tech degree with another passion – think a double degree in computer science and media arts if you want to be an animation specialist, or combine IT and design if you want to create wearable technologies.

Or get into VET

There are loads of non-uni tech qualifications – certificates, diplomas and advanced diplomas from TAFE and polytech – that can land you a job with industry-ready skills or provide an alternative pathway into an undergraduate degree.

Courses range from software development and programming to general IT support, interactive media and games, web development and more.

You could even get your first qualification before you finish high school, with Vocational Education and Training (VET) courses available as Year 11 and 12 electives.

Online events

Mark your calendars for these upcoming events in tech:

- Now until December 31: STEM 2021 'On Demand': stem2021.com.au
- December 6–12: Hour of Code (during Computer Science Education Week): csedweek.org



Fill your feeds with tech Instagram

Follow [@codergirl_](https://twitter.com/codergirl_) (aka software engineer Lauren Medalia) – she shares resources for fellow coders, including everything from job hunting to JavaScript.



TikTok

[@misodope](https://www.tiktok.com/@misodope) is a fullstack engineer who's into "code, careers and cringe". He posts hilarious videos about life as a programmer and behind the scenes of fixing bugs!

YouTube

Careers with STEM – yep, it's us! Our STEM videos include interviews with tech experts sharing their pathway advice, coding tips and tricks, and future jobs to get excited about.



Want more?

Visit [CareerswithSTEM.com](https://careerswithstem.com) to get all the inspo from our STEM career profiles, and take our tech quizzes: bit.ly/cws-tech-quizzes

To find courses and compare unis in Australia, check out gooduniversitiesguide.com.au

In NZ? Find tech degrees at universitiesnz.ac.nz

REFRACTION

MEDIA

CAREERS WITH STEM.COM

Google



Commonwealth Bank

Careers with STEM: Technology+Cyber Security 2021 is a publication and trademark of Refraction Media. Copyright © 2021 Refraction Media, all rights reserved. No part of this publication may be reproduced in any manner or form without written permission. If you would like to reproduce anything from this magazine, email: info@refractionmedia.com.au.

We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past, present and emerging.

This issue went to press on 29 September 2021. Printed in Australia by IVE.

Cover image: Katrina Hu (Technology), Andy Go (Cyber Security)

Produced and published by: Refraction Media
Co-founder, CEO & Publisher:
Karen Taylor-Brown

Co-founder, CEO & Head of Content:
Heather Catchpole

Managing Editor: Gemma Chilton

Digital Editor: Cassie Steel

Production Editor: Louise Meers

Deputy Editor: Pippa Duffy

Art Director: Katherine Power

Writers: Amelia Caddy, Ben Skuse, Cassie Steel, Chloe Walker, Gemma Chilton, Hannah Diviney, Heather Catchpole, Jonathan Nalder, Louise Meers, Nadine Cranenburgh, Pippa Duffy, Sarah Kellett, Saskia Horgan-Catchpole

SUBSCRIBE AND ORDER COPIES:
careerswithstem.com/subscribe

EDITORIAL & ADVERTISING ENQUIRIES:
Email: info@refractionmedia.com.au
or +612 9188 5459

POSTAL ADDRESS: PO Box 38,
Strawberry Hills NSW 2012 Sydney, Australia

careerswithstem.com

ISSN 2209-1076



FLIP OVER
FOR CYBER SECURITY

