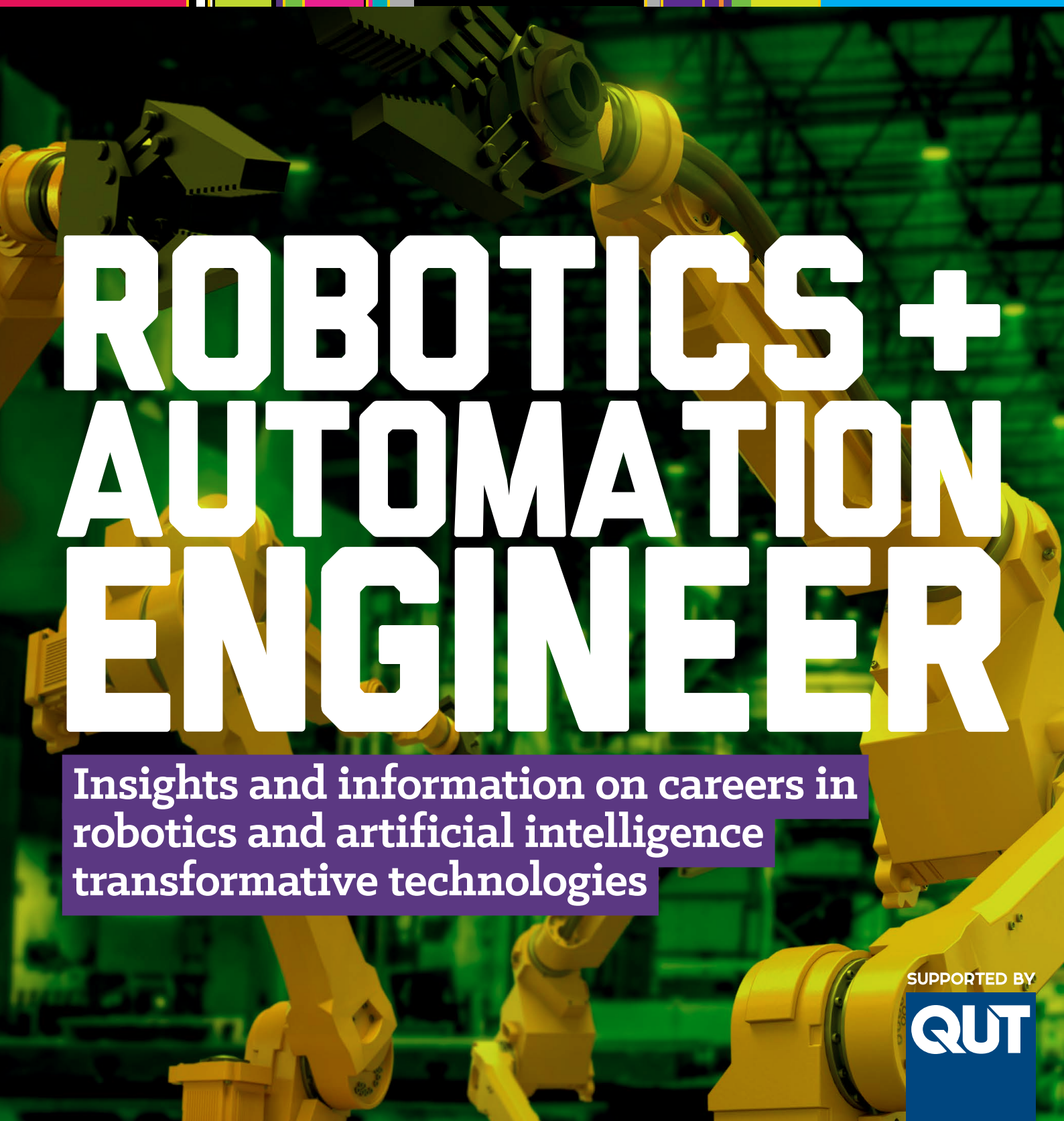
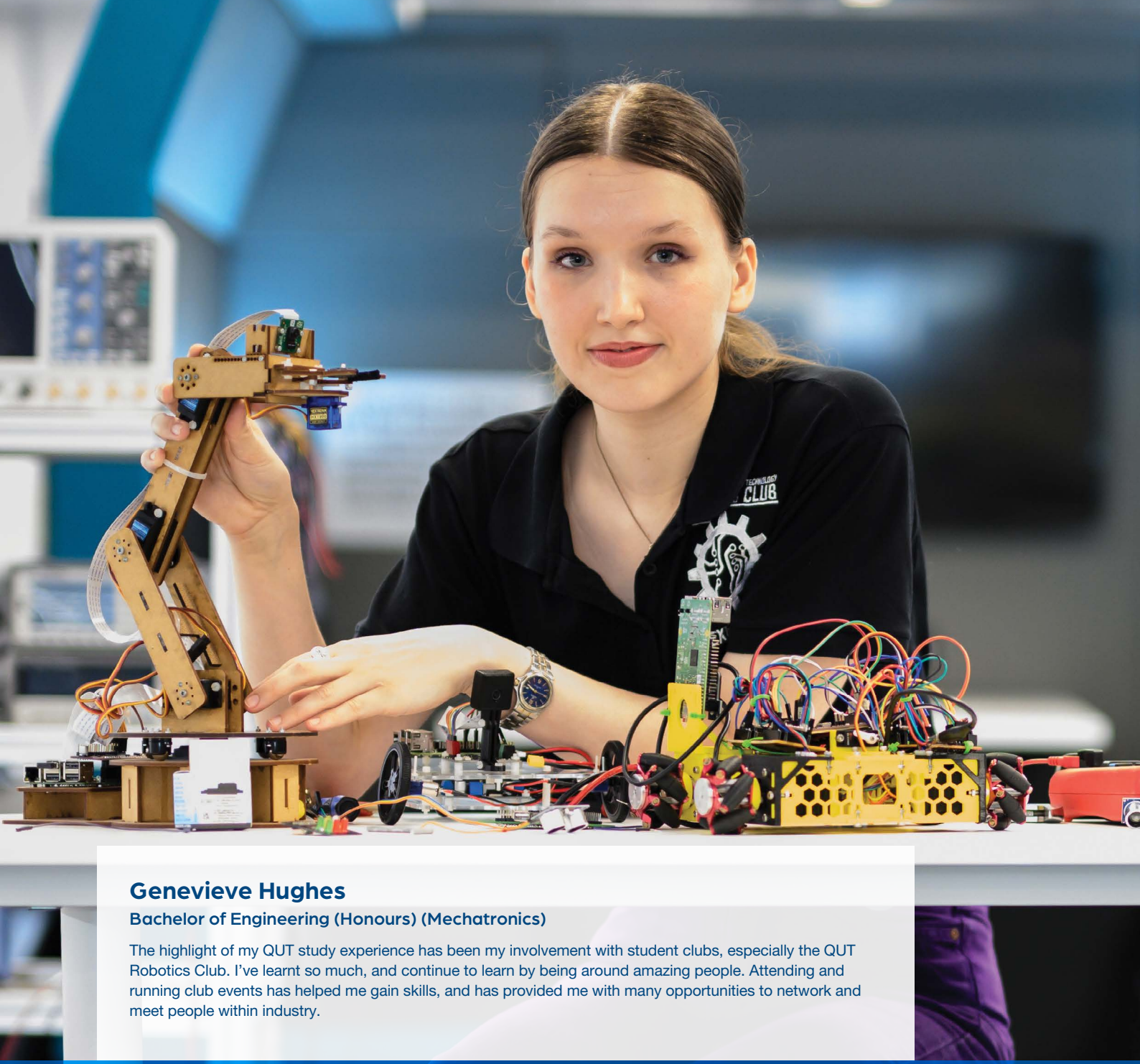
CAREERS WITH STEM™ JOB KIT



ROBOTICS + AUTOMATION ENGINEER

Insights and information on careers in robotics and artificial intelligence transformative technologies

SUPPORTED BY QUT



Genevieve Hughes

Bachelor of Engineering (Honours) (Mechatronics)

The highlight of my QUT study experience has been my involvement with student clubs, especially the QUT Robotics Club. I've learnt so much, and continue to learn by being around amazing people. Attending and running club events has helped me gain skills, and has provided me with many opportunities to network and meet people within industry.

Accelerate your career

Combine a Bachelor of Engineering (Honours) with a Master of Robotics and AI

QUT is the only university in Australia with this offering.

the university for the real world

QUT

JOIN THE ROBOT REVOLUTION

Will robots replace jobs? Only the ones we don't want – and with the right STEM skills, the age of automation could mean big career potential

PETER CORKE
DISTINGUISHED PROFESSOR OF ROBOTICS, QUT

Robots, automation and artificial intelligence (AI) are changing the way we work. As our businesses and economy transform in the face of these new technologies, we will need more experts who can build and maintain it and drive further innovation. Job growth in robotics is projected to rise by 5.5 per cent in the next five years, and CSIRO predicts Australia will need up to 161,000 new AI-savvy workers by 2030*.

This means skilling up in the right areas could spell big career opportunities in the future – designing and building the machines that will one day perform mostly unpleasant, dangerous or boring tasks for us.

While the robot revolution may be disruptive as our economy adjusts, the dream is that our industries will become more efficient and profitable with humans taking on jobs that are safer, more creative and more highly skilled.

At QUT's Centre for Robotics, we're conducting world-leading research into intelligent robotics and autonomous systems, in everything from how robots interact with humans to autonomous decision making and robotic vision. We have worked on robots saving the Great Barrier Reef, harvesting fresh produce and performing surgery.

If that sounds exciting to you – and if you love new tech, making things, problem-solving and thinking outside the box – then a career in robotics and automation could be for you.

Read on to learn more about how to build a career in this field, and to meet real-life people already working at the cutting edge of robotics.

Distinguished Professor of Robotics, Peter Corke, QUT

"CSIRO PREDICTS AUSTRALIA WILL NEED 161,000 NEW AI-SAVVY WORKERS BY 2030"

Check out CareerswithSTEM.com for more insights, information, inspiration and advice about robotics & automation careers!

SOURCES: SEEK.COM.AU, CSIRO NEWS RELEASE

It's a ROBO world

From household helpers to medical lifesavers, robots and the automated world they come from are changing our future. But it takes humans to invent them

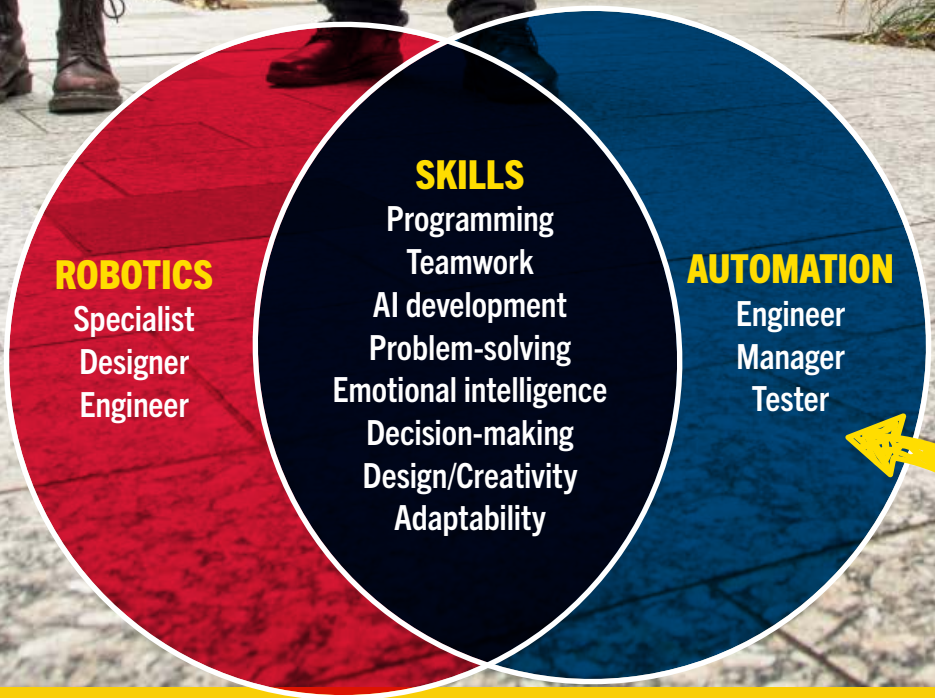
Robots and automation are making our world better! They help people by taking over dangerous, dirty, or boring jobs, like sorting packages at a delivery center or exploring other planets. Plus, they make things faster and more efficient, like in factories.

People who work in STEM fields, especially engineers and computer scientists, have important jobs making, fixing and using robots and automation systems. And as technology keeps getting better, robots and automation will be used in even more places like hospitals, schools and farming.

Australia is a leader in the robotics and automation world and there's a lot of room for growth. In 2020, Robotics Australia Group was started to help make sure the industry continues to grow and succeed. They even made a 'roadmap' report to help guide the industry. According to the report, from 2018 to 2021, the amount of money invested in Australian companies making drones and robots went up by $130 million, and the industry grew from $12 billion to $18 billion in that same period*.

Field robotics is a special type of robotics used in industries like farming and mining. Australia is a global leader in field robotics so there are lots of opportunities in this, ah, field in particular!

And that's just the beginning! There's so much more to learn about careers in robotics and automation. Whether you're interested in designing robots, programming them to do cool things, or fixing them when they break down, there's a STEM job out there for you.



*A ROBOTICS ROADMAP FOR AUSTRALIA, 2022, ROBOTICS AUSTRALIA GROUP

IN THE BANK

IF YOU'RE BUDGETING WHAT A JOB IN A ROBOTICS LAB, DESIGN AND DEVELOPMENT TEAM OR AUTOMATION ENGINEER IS PAYING. TAKE A LOOK AT THESE NUMBERS:

Graduate robotics engineer
$52K → A few years on the clock **$142K**

Graduate automation engineer
$58K → A few years on the clock **$122K**

SKILLS SPOTLIGHT

ROBOTICS AND AUTOMATION ARE SAME, SAME BUT DIFFERENT. SO, WHEN IT COMES TO CHOOSING A CAREER PATH, IT'S EASY TO GO EITHER WAY...

NEW JOBS!

THE '100 JOBS OF THE FUTURE' REPORT HAS IDENTIFIED SOME POTENTIAL NEW AND SURPRISING ROLES IN ROBOTICS AND AUTOMATION. WHICH ONE'S FOR YOU?

[1] **Robot ethicist** – they'll be focused on all the ethical issues that are connected with artificial intelligence, robots, cyborg technologies and augmented and virtual reality.

[2] **Child assistant bot programmer** – future designers of humanoid robots (also known as kiddobots) that will help children play safely. These robots will do things like read nursery rhymes, personalise stories, and teach basic numeracy and language skills, as well as supervise a child's free time, in real life and online.

[3] **Cyborg psychologist** – they'll work with people who have synthetic organs, robotic limbs and body implants. The goal? To help individuals come to terms with living as cyborgs.

[4] **AI intellectual property negotiator** – a next level patent lawyer! These STEM pros will negotiate on behalf of AI entities that have created new things. They'll also represent humans when AI has used their ideas without permission.

[5] **Automation anomaly analyst** – who you'll call when AI gets it wrong. This kind of analyst will tweak the algorithm so you get a better solution, and will identify and 'wind back' the data inputs that led to the incorrect result.

[6] **Digital augmentation officer** – these experts will work with companies to choose the right AI and tech solutions to assist with tasks within a business.

MECHATRONICS MAESTRO

WHEN SHE'S NOT STUDYING TO BECOME A ROBOTICS ENGINEER HERSELF, QUT UNDERGRAD GENEVIEVE HUGHES IS INSPIRING THE NEXT GENERATION TO FOLLOW IN HER FOOTSTEPS

Genevieve was a bit of an all-rounder in high school. Her favourite subjects were literature, Japanese, digital solutions, maths and physics. It was her STEM subjects that made her realise she had a knack for problem-solving. Genevieve had toyed with ideas of being a teacher or an inventor after school, but then she got into robotics through extracurricular activities and saw some cool medical robotics through her dad's work as a doctor, and decided to study Engineering at QUT, majoring in mechatronics and medical engineering.

In some ways, she's now on the path to being an inventor (AKA engineer) and a teacher.

"I've since learned that you can be a teacher wherever you are, and I get to do that every week as a Robotics Coach," she says. Yep, when Genevieve isn't attending her engineering classes or working in her role as President of QUT's Robotics Club, she's over at her old high school, teaching the next generation of engineers as a robotics coach.

"I get to inspire them and encourage them to pursue what they enjoy, despite the stereotypes that lie before them," Genevieve says of her work as a coach at her old all-girls school.

"Women are so important in the robotics field, and it's my hope that coaching these girls and helping them to enjoy robotics means that one day they'll get to change the world."

REAL-WORLD EXPERIENCE

Genevieve has already had some awesome real-world experience while studying her degree. The highlight was a summer internship where she worked on an industry project for Boeing Research and Technology. She got to contribute to the planning, software development and testing of the product, and she says the experience gave her software skills a big boost. She also loved the chance to get a first-hand insight into the power of robotics to change the world.

"I got to work in an incredibly diverse team that opened my eyes to the way that engineering can be used for the good of humans, and how humans can interact with it," she says.

"I am looking forward to entering a workforce that sees the holistic impact of robotics, especially in the fast-paced medical robotics field." – *Gemma Chilton*

BACHELOR OF ENGINEERING (HONOURS) (MECHATRONICS AND MEDICAL ENGINEERING), QUT >> ROBOTICS COACH, SOMERVILLE HOUSE >> BIO 3D PRINTING LAB ASSISTANT, BIOBKN >> SUMMER INTERN, BOEING RESEARCH AND TECHNOLOGY >> PRESIDENT, QUT ROBOTICS CLUB

SARAH EISENMENGER
FOUNDER, ZEST ROBOTICS

Bot business

Sarah Eisenmenger mixes robotics and AI with business to help close the STEM gap in schools

Can you guess what a robotics business builder's favourite subject was in high school? English! Sarah did know that she wanted to be an engineer during school though, and even founded her very own company, ZEST Robotics, when she was just 16.

At ZEST Robotics, Sarah is an advocate for girls in STEM.

"I organise and deliver quality engineering, science and robotics education to girls through hands-on workshops and events," she explains. Sarah also speaks to schools, industry and government on the importance of establishing more female-focused opportunities for girls to discover STEM inside schools.

The coolest part of her job is what she calls the 'lightbulb moment', which happens when a student, who has been struggling with a coding concept, finally understands why their code does or doesn't work.

"It shows that through resilience, many things are possible!"

Sarah believes STEM teaches strong problem-solving skills, which has been important in every aspect of her life. She's also excited about the upcoming opportunities in robotics and AI and sees it as an interesting new medium for all different kinds of industries.

And being passionate about business and engineering? It's a no-brainer then that she's studying business and engineering at QUT.

On going to uni, Sarah says: "I've discovered that one of the most valuable parts of the learning experience are the communities and connections you build while studying. Join student clubs, attend university events and ask lots of questions!"

As for the future, she'd love to do further study in AI and maybe even complete a Masters of Robotics and AI at QUT. She also wants to grow ZEST Robotics and innovate on ways to reduce the STEM gap. – *Louise Meers*

"JOIN STUDENT CLUBS, ATTEND UNIVERSITY EVENTS AND ASK LOTS OF QUESTIONS!"

BACHELOR OF BUSINESS (MANAGEMENT)/BACHELOR OF ENGINEERING (HONOURS) (MECHATRONICS), QUT (ONGOING) >> **FOUNDER, ZEST ROBOTICS**

Get the job!

Want a career in robotics and engineering? Start here

Choose this career if you...

> Love cutting-edge tech
> Love maths and coding
> Are creative and work well in teams
> Love problem-solving
> Love learning new things

GET QUALIFIED

Finishing high school and wondering what to study?

Want to fast-track your career and graduate with cutting-edge, future-proof skills (and two degrees under your belt) in just five years?

QUT's Bachelor of Engineering (Honours) / Master of Robotics and Artificial Intelligence vertical double degree will equip you with foundational engineering skills (with four engineering majors to choose from), as well as the advanced technical and project management skills you need to kickstart a career in robotics and AI when you graduate.

Electives checklist

Choosing high school electives? These subjects will set you on the right path to a career in robotics & automation:

✔ Maths
✔ Engineering Studies
✔ Computing Studies
✔ Design and Technology

SOCIAL HANDLES TO GET A HANDLE ON

For some of the coolest developments in the robotics and automation world, hit search on these exciting innovators

Twitter @catrionawallace

Not only is Dr Catriona Wallace a boss lady in machine learning, she's a world-renowned expert in the ethical implications of Artificial Intelligence (AI), a women in STEM trailblazer and a human rights activist. Click like.

Instagram @openaidalle

AI content generation is so hot right now. Follow DALL·E by OpenAI on IG for daily doses of cool, quirly art all created by computers. Then click the link in their bio to have a play with the cool tech yourself!

TikTok @sineadbovell

Futurist and entrepreneur Sinead Bovell is over on TikTok dishing up some pretty cool insights into the world of AI and automation, including how it might impact future careers. Her company called WAYE is all about educating young people about business, tech and the future. Give her feed a follow, stat.

YouTube Simone Giertz

The Queen of Shitty Robots

Simone is a self-described "inventor and breaker of things" and her YT channel his is great for a giggle. Plus, you get to see simple, creative robotics built with imagination and innovation.

SHUTTERSTOCK

WHY STUDY ENGINEERING

WWW.QUT.EDU.AU/STUDY/ENGINEERING/WHY-STUDY-ENGINEERING

Refraction Media acknowledges 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 edition was published on 28 October 2020 and updated on 16 February 2023.

CAREERS WITH STEM