CAREERS WITHSTEM™

DATA SCIENTIST

Insights, information and advice on STEM careers that count!

Think STEM.
Think QUT.

Studying STEM at QUT opens a world of opportunities to achieve your full potential and forge a rewarding career.

Discovering how to improve lives by solving a range of real-world problems will be crucial in the future. Many of the jobs of today were unheard of a decade ago: app developers, big data analysts, nanotechnologists and sustainability engineers.

We all know that careers in STEM provide the greatest opportunities to succeed in the future.

No university is better placed to help you launch your STEM career than Queensland's only university of technology.

Search QUT STEM to learn more about your study options, scholarship opportunities, and life as a QUT STEM scholar.

QUT
the university for the real world

FUELLING THE DIGITAL ECONOMY

Love numbers, analysis, trends and computers? Data scientists are helping governments and organisations make smarter decisions – with massive career potential

KERRIE MENGERSEN
PROFESSOR OF STATISTICS, QUT

Watch a recording of our live webinar with real-life data scientists at **bit.ly/cws-data-webinar**

Data is all around us, generated constantly, all day everyday. Every time you use your smartphone, buy products at the supermarket or stream something on TV, you're generating potentially useful data, or digital information.

This huge resource — sometimes called 'big data' — has been described as "the new oil of the digital economy", because it is full of untapped value that is fuelling the industries of the 21st century (without the CO_2 emissions!).

To harness that value, we need people skilled in mathematical, statistical and computer sciences. Data scientists don't just read and interpret data, they use it to uncover new insights, understand key drivers of important outcomes, make predictions, and then communicate that information to organisations, governments and institutions to help them make smarter, data-supported decisions. That means data scientists need to be good communicators too, and being a trend spotter who can think outside the box will also give you an edge.

Demand for data scientists is huge, across all sorts of industries — from banks to big tech companies, media to retail. According to a report from global consultancy company Deloitte, in 2018 more than three quarters of businesses were planning on increasing their capabilities in data analytics by 2020!

At QUT, our vision is to be a national and global leader in developing methods to use data to benefit

> **DEMAND FOR DATA SCIENTISTS IS HUGE, ACROSS ALL SORTS OF INDUSTRIES — FROM BANKS TO BIG TECH, MEDIA AND RETAIL."**

our world. Our Bachelor of Data Science, Bachelor of Mathematics, Bachelor of Information Technology or Masters of Data Analytics will set you on the right path to a career as a data scientist, while our Centre for Data Science also provides research and training opportunities, led by internationally renowned statisticians and computer scientists.

I hope this Job Kit will give you a taste of all that this exciting and fast-growing field has to offer.

Distinguished Professor of Statistics, Kerrie Mengersen, QUT

SHUTTERSTOCK, QUT

Check out CareerswithSTEM.com for more insights, information, inspiration and advice about data scientist careers!

Data drop

Working in data science is literally the most popular job in the country RN, and job ads are still calling out for people to fill new roles. Think it could be for you but aren't totally sure about the gig? Read on…

Data and scientist go together like fish and chips; social and media; Rick Astley and memes. As the world creates more data, we need more people to push the boundaries in tech, discovery, research, development and analysis around the globe. Data is information collected for analysis or reference. According to CSIRO data science research Data61, the world's data is growing by

2.5 quintillion bytes every year. That's A LOT of data. Sorting through the data, deciding what's useful, identifying trends and analysing the findings are data scientists, analysts and engineers. Whether it's in retail, conservation, humanities, transport, health or computer science, there's a growing need for data savvy experts to unpack what all of this information reveals.

In a nutshell, being a data scientist is about making data work for you. It's looking through raw data and working with software tools and statistical methods to recognise patterns that can help with marketing to the right people in the retail space; solving problems in industry

and government (think: streamlining processes); or identifying key trends to help the medical sector screen for health issues.

The roles are wide and varied, and with data mining the second highest skill requested by employers in the last five years and "data scientist" ranked as the top job in terms of jobs advertised, pay offered and happiness at work, it's no wonder the field is booming.
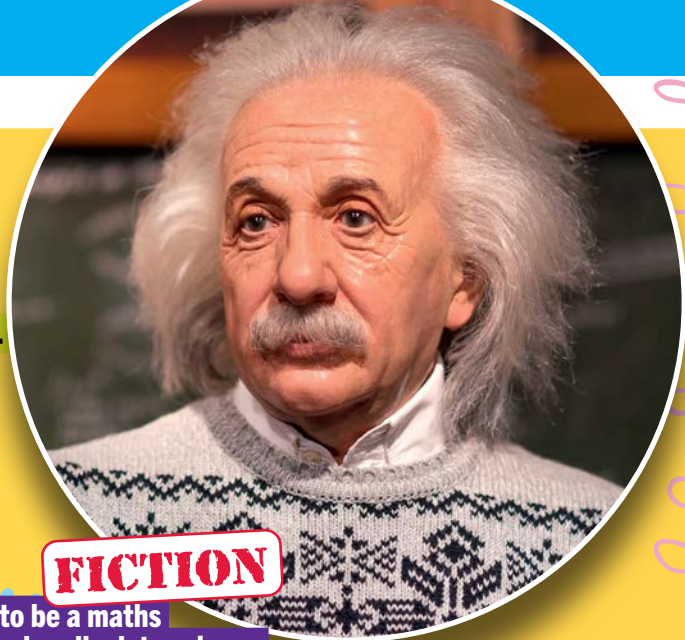
Here's all you need to know about a career in data science…

Payday The average annual income for a data scientist is set to pass **AU$130K** within the next 12 months (*2021 Deloitte).

FACT FROM FICTION

THERE ARE PLENTY OF UNTRUTHS OUT THERE ABOUT WHAT CAREERS IN DATA SCIENCE INVOLVES. HERE'S WHAT TO IGNORE AND WHAT TO TAKE NOTE OF...

#1 A data scientist is the same as a data engineer which is the same as a data analyst — FICTION

There's a lot of overlap between these roles, and they are sometimes talked about as if they are the same thing, but there are some key differences!

- **Data Engineers** are responsible for designing, building, and maintaining all of the infrastructure needed for data generation, including tidying up raw data to make it readable and useful.

- **Data Analysts** use the tools of data engineers to analyse data and report on what they find, identifying trends, creating charts and visual representations of the data. They are similar to data scientists but generally it's more of an entry level job. Other titles for data analysts include business analyst and market research analyst.

- **Data Scientists** overlap a lot with analysts, but go beyond the reading and reporting of data — often coming up with their own questions (hypotheses) and creating computer algorithms to make predictions based on data.

FICTION

#2 You need to be a maths rockstar to handle data science

You need to have many skills but being Einstein ain't one of them. Understanding maths and reading statistics is handy, but the main thing maths brings to a data science role is the ability to think through problems logically and poke at problems until you find an answer. For instance, if you worked in an insurance firm, you could be combing through statistics to consider the number of car claims in a particular year and weigh up if an increase in fees is needed.

#3 Big data is information that comes from big companies

Well, it's not completely untrue. Big data *can* come from big companies, but it is the term used for large volumes of data capturing information at high speed from various sources. The Aussie government, for instance, has tonnes of data uploaded through its systems daily — like car regos, Medicare claims and education info. A data analyst looks at what the information is saying, so that the people making big decisions have all the facts.

FICTION

#4 You will never stop learning — FACT

Tools and required skills are changing quickly, so there will always be something new to understand. You don't come out of uni ready to be a data scientist, you will keep learning your whole career.
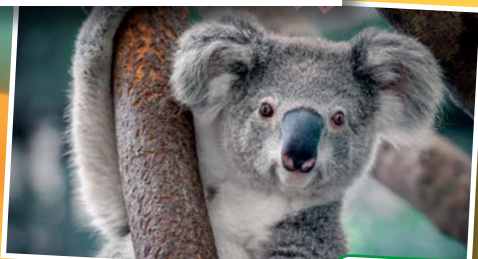
#5 Australia employs big in the data science field — FACT

Yep, Australia is one of the top 10 employers of data scientists in the world, so let's hear it for the homegrown talent.

There's no I in TEAM

Data scientists are important to business development and profitability, but they also contribute to areas beyond big biz. Mining for data can also include finding key learnings for non-profits on how to help under-priveledged communities access clean water or to help environmental groups to protect endangered species and habitats. But they don't do it alone. Data scientists collaborate with a hit list of other skilled peeps, including:

- **Clients**
- **Business analysts**
- **Product developers**
- **Project managers**
- **Engineers**
- **Software developers**
- **Marketers**
- **Designers**

THE ONLY WAY IS UP

You can forget about worrying if you'll have job security in a data science career as it's one of the fastest growing avenues of STEM with an anticipated growth in employment of almost 13% over the next five years.

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SOLVING BIG BUSINESS PROBLEMS THROUGH DATA

A DOUBLE DEGREE IN PHYSICS AND ENGINEERING LED ASHLEIGH LAU IN AN UNEXPECTED CAREER DIRECTION

As a kid, Ashleigh Lau loved to take machines apart. "In my spare time, I would play around with things like cameras or the sewing machine and take them apart to see how it all fits together," she says.

Her interest in mechanics led her to study a double degree in physics and mechanical engineering at QUT. Now, two years after graduation, Ashleigh is working as a data analyst at global consulting company Deloitte.

"While I was at uni, I found that my favourite parts of both science and engineering were the pracs and the experiments, collecting the data and then analysing it," she says. "I did a couple of internships that were more in the data analytics space, and I just fell in love with it. It was my favourite part of both of my degrees condensed into one field.

"I applied for more data-focused jobs, and landed in the consulting world. At the core it's really similar to solving science and engineering problems, but it's business problems instead."

FAST PACED, REAL-WORLD OUTCOMES

Ashleigh's first role was at Quantium, a data consulting firm, where she had previously completed an internship. It was here that she started to learn the foundations of data analytics, including coding in MATLAB and SQL (structured query language). It was also her introduction to working with clients as a consultant.

Now, as part of the forensics team at Deloitte, she helps major companies solve big accounting problems such as ensuring underpaid employees receive what they're owed, or identifying fraud.

> **"I JUST FELL IN LOVE WITH IT. IT WAS MY FAVOURITE PART OF BOTH MY DEGREES."**

"It can be really fast paced," Ashleigh says. "And I like that there are tangible outcomes. Sometimes we work on high profile projects, and it's really exciting to do the work during the day and then turn on the TV at night and see your project on the news."

Ashleigh is keen to continue developing her analytics skills and learning more about consulting.

"I chose analytics because it is so open to possibilities. There are so many things you can do with it," she says. "I would like to manage a team and my own projects, but as long as it still involves data and solving actual problems, I think I'll be happy."

Ashleigh's advice to anyone planning their future is to just follow what interests you.

"So many things change and the world changes and you change," she says. "I think if you kind of pick something that you enjoy, every step of the way you'll find your process. Just be true to yourself and do what you enjoy." — *Chloe Walker*
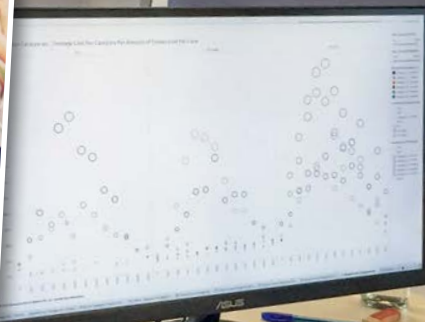
SHUTTERSTOCK

BACHELOR OF SCIENCE (PHYSICS)/ BACHELOR OF ENGINEERING (MECHANICAL), QUT >> **PROJECT RESEARCH OFFICER, CSIRO** >> **INTERN, QUANTIUM** >> **ASSOCIATE ANALYST, QUANTIUM** >> **ANALYST, DELOITTE**

A day in the life of a...
DATA SCIENTIST

After a double degree in Science and Mathematics at QUT, Luke Ginn taught himself to code and entered the brave new world of data science

In his role at data company Interlate in Brisbane, Luke uses data and algorithms to help mining companies optimise their safety, efficiency and productivity.

But his skills could be used in many other applications, like finding the best temperature to brew the perfect beer!

"I was blown away that it was something people could do for a job!" he says.

After his Bachelor of Mathematics degree at QUT, Luke taught himself coding, which led to a data science internship at Woodside Petroleum in Perth. Combined with some impressive software experience on his LinkedIn profile, this led to him being headhunted by Interlate for a full-time data science job.

Coding and data science skills are rare in new graduates, and roles like Luke's usually get snapped up by Masters grads or people with workforce experience.

"Don't rely on your uni courses alone," Luke says, adding that there are loads of free data science tutes online.

Here's what a typical day looks like:

8.00am
I like to have an early start so I can finish early! First, I check the algorithms that run 24/7. They try to predict what is happening in clients' factories and make recommendations about the best operating conditions (eg temperature, amount of chemicals and water).

8.15am
Every day depends on my current priorities, so I review what's at the top of the list. I might also help work colleagues out or ask them for help and manage grads to make sure they're on top of everything.

9.15am
My work is typically data or machine-learning related. I might write code to make algorithms better, be creative to solve tough problems, or create a new model for a client. I also plan what to build in the next six months and meet with clients to make sure everyone is happy.

1.00pm
I can't do lunch any later than 1.30pm. I get too hungry! During the pandemic I've been working from home most of the time, so I might go for a walk in the garden.

1.30pm
Continue with projects and helping other team members. This week, one of the other data scientists was trying to implement a new machine learning model and kept trashing the computer!

3.30pm
Check in with my team and plan the next day.

4.00pm
After work, I love Latin dancing! It's lots of fun. Three or four nights a week I go to dance classes or parties. — *Nadine Cranenburgh*

RESEARCHER, UNIVERSITY OF MELBOURNE

DATA SCIENTIST AND MACHINE LEARNING ENGINEER, INTERLATE, BRISBANE

RESEARCHER, QUT

BACHELOR OF SCIENCE (APPLIED CHEMISTRY)/BACHELOR OF MATHEMATICS, QUT

DATA SCIENTIST, WOODSIDE ENERGY, PERTH

Get the job!

Ready to dive into a career with data? Start here

Electectives checklist

Electives checklist

Choosing high school electives? These subjects will set you on the right path to a career in data science.

✔ Maths
✔ Computing studies
✔ Engineering studies
✔ Business Studies
✔ Economics

LISTEN AND LEARN

Plug into these three podcasts to start learning about data science at home

Data Skeptic
This podcast features interviews and discussions on all things data science, statistics, machine learning and artificial intelligence (AI), and stories about our data-driven world. **dataskeptic.com**

Data Science at Home
Hosted by software engineer and chief data scientist at AI and machine learning company, Amethix Technologies, Francesca Gadelata, this podcast brings intriguing discussions about technology, machine learning and AI. **datascienceathome.com**

O'Reilly's Data Show
O'Reilly is an American learning company that publishes books, runs tech conferences and provides an online learning platform — plus this podcast, which is about all things big data, data science and AI. **bit.ly/oreilly-podcast**

CRACK THE CODE

Get basic coding skills while you're still in school…
• Scratch.mit.edu is a simple, free block coding program toget the basics
• Grasshopper is a coding app for beginners: **grasshopper.codes**
• There are hundreds of hours of coding activities at **code.org/learn**
• Join a code club or start your own — check out **codeclubau.org**

FILL YOUR FEED

Double tap these data science socials to fill your feeds with inspo

Reddit: r/dataisbeautiful
Like the name suggests, this subreddit is full of cool, fascinating or quirky data visualisations.

Twitter: @hmason
Hilary Mason is a data scientist, machine learning expert and lover of cheeseburgers.

YouTube: Data School
This YouTube channel is packed with tutorials literally all about getting a job in data science, run by data science educator Kevin Markham.

Choose this career if you…

> Love spotting trends
> Think outside the box
> Enjoy coding and maths
> Are a good problem solver

CAREERS wITHSTEM