IT, AI & BIG DATA

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"All the news you need to know and what it means for the next wave of IT, AI and Big Data Careers. More Importantly see how key industry trends are informing and influencing our teaching.
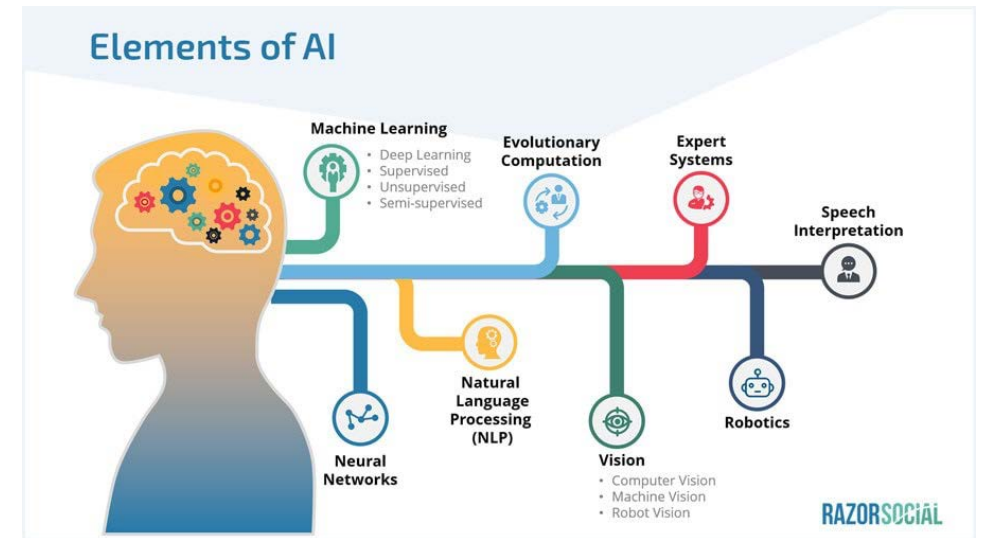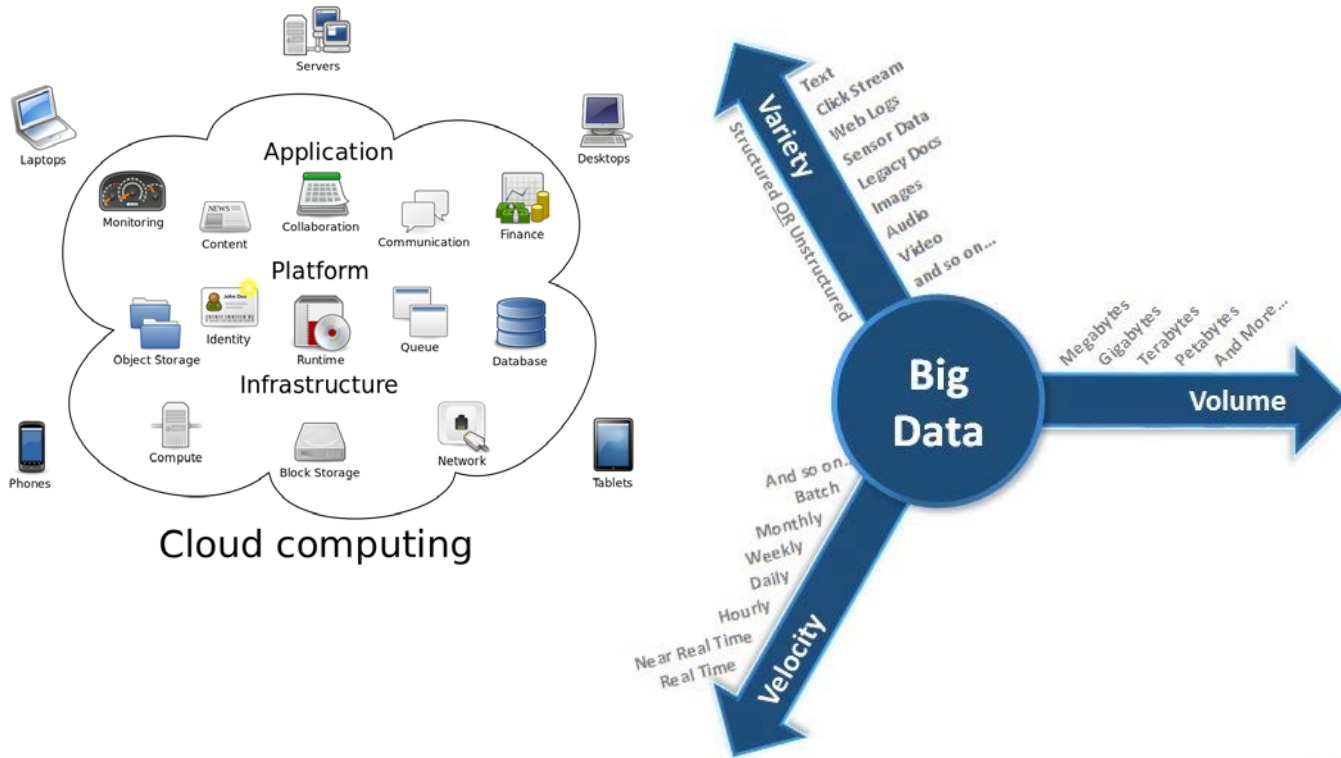
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Dr Chris McCarthy:

- Senior Lecturer in Computer Science and Software Engineering
- School Director of Industry Engagement
- Work-Integrated Learning Coordinator

Teaching:

- Software Development
- Computer Systems
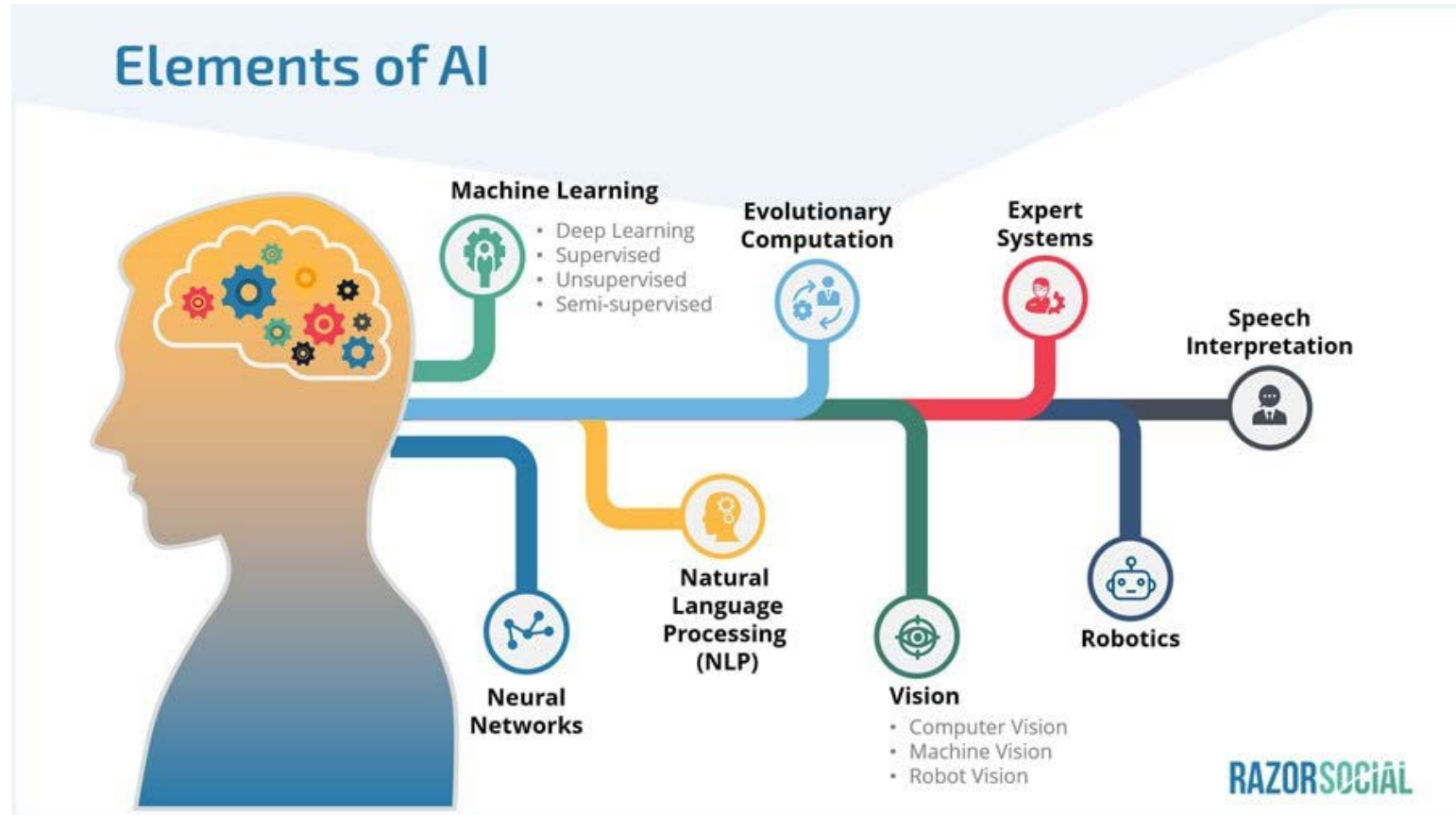- Mobile Development

Research:

- Artificial Intelligence
- Machine Learning
- Robotics
- Human-Computer Interaction

What is AI?

the development of computer systems able to perform tasks requiring human intelligence (e.g., visual perception, speech recognition, decision-making etc.)

Associated ICT Disciplines:

- software dev, GPU (parallel) computing, data science/analytics, machine learning, computer vision, natural language processing, mathematics, algorithms, optimisation, cybersecurity, robotics.

Elements of AI

Machine Learning
- Deep Learning
- Supervised
- Unsupervised
- Semi-supervised

Evolutionary Computation

Expert Systems

Speech Interpretation

Neural Networks

Natural Language Processing (NLP)

Vision
- Computer Vision
- Machine Vision
- Robot Vision

Robotics

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Image source: www.quora.com

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What is Big Data?

The analysis, systematic extraction of information from, or general handling of data sets that are too large or complex to be dealt with by <u>*traditional data-processing application software*</u>.

Concerned with technologies designed to economically extract value from very large volumes of a wide variety of data, by enabling high-velocity capture, discovery and/or analysis

Associated ICT Disciplines:

- software dev, data analytics/mining, database design and management, algorithms and data structures, visualization, cybersecurity, Internet-of-Things …

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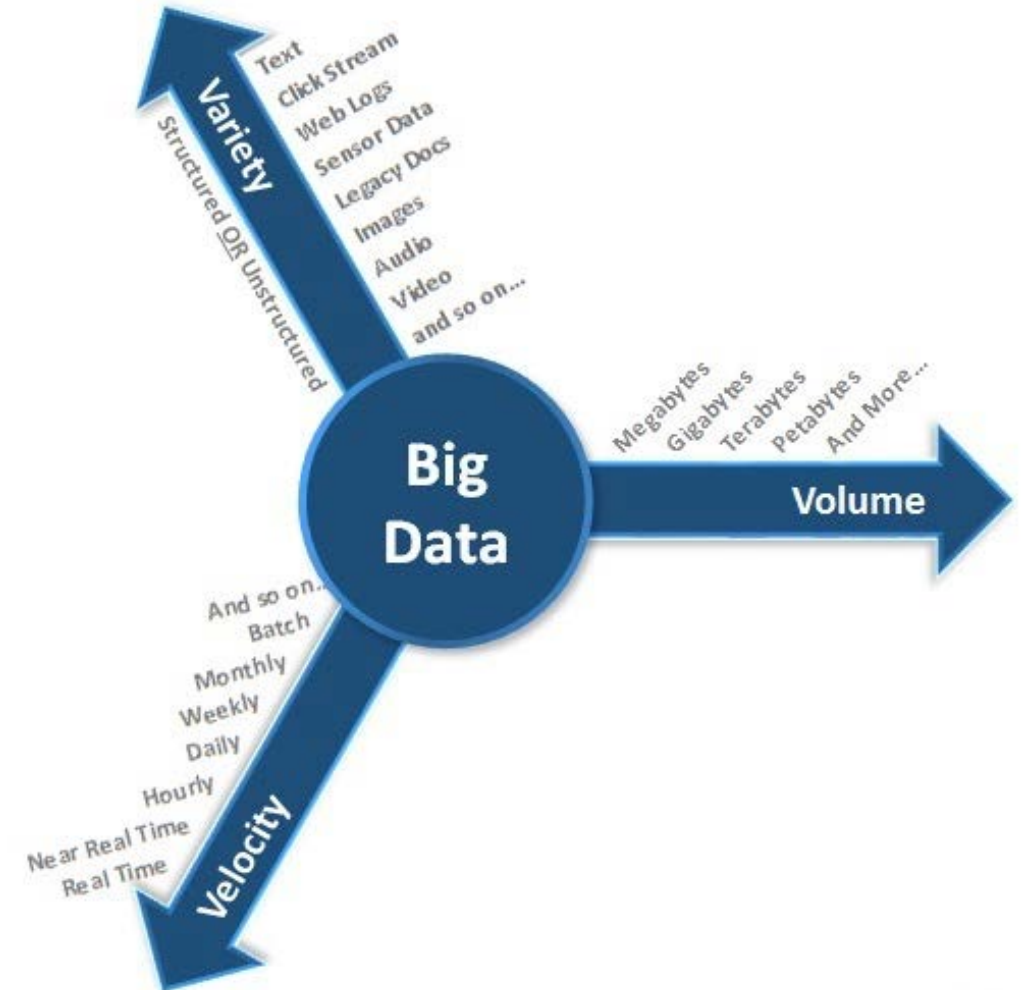
What is Cloud Computing?

on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the user

Infrastructure as a Service (IaaS)

- Microsoft Azure, Google Compute Engine

Platform as a Service (PaaS):

- Amazon Web Services (AI, Data Analytics)

## Software as a Service (Saas):

- Google Apps, Microsoft Office 365

Associated ICT Disciplines:

- Web development, cloud architecture, edge computing, network design/administration, cybersecurity, database management, software development, Internet-of-Things

Image src: https://en.wikipedia.org/wiki/Cloud_computing#/media/File:Cloud_computing.svg
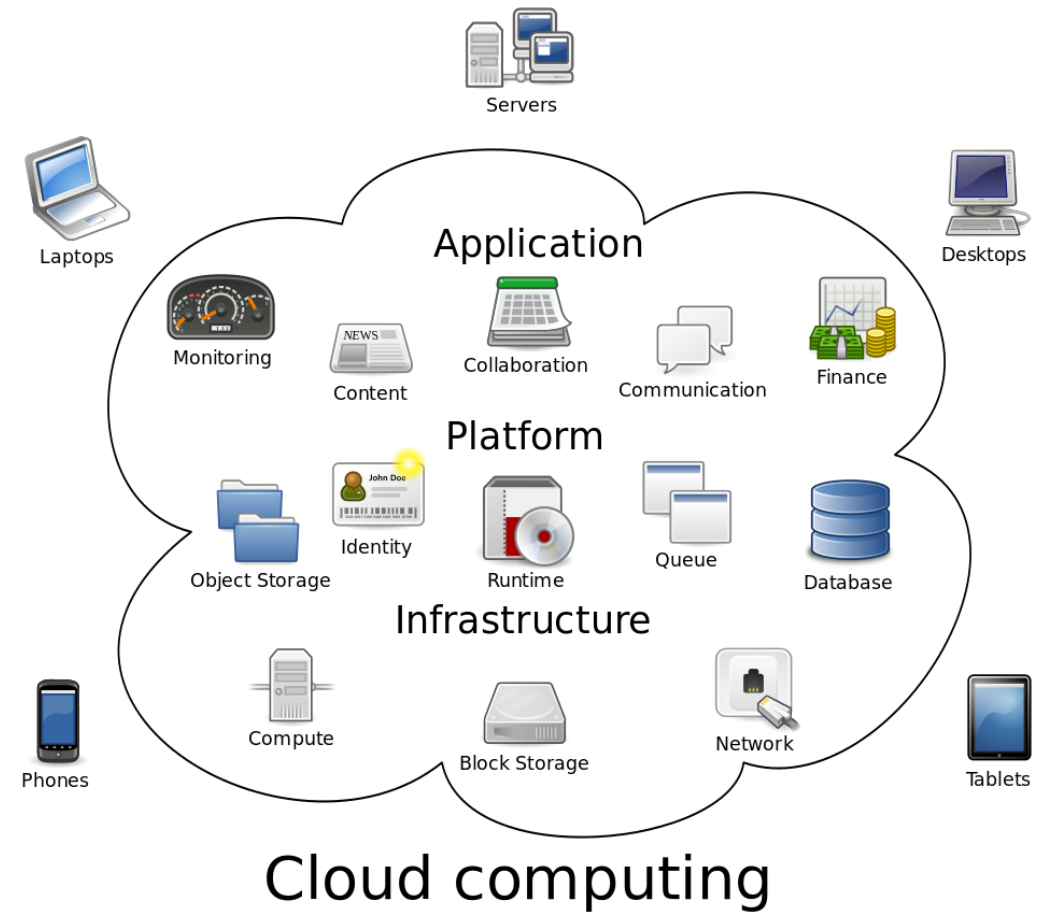
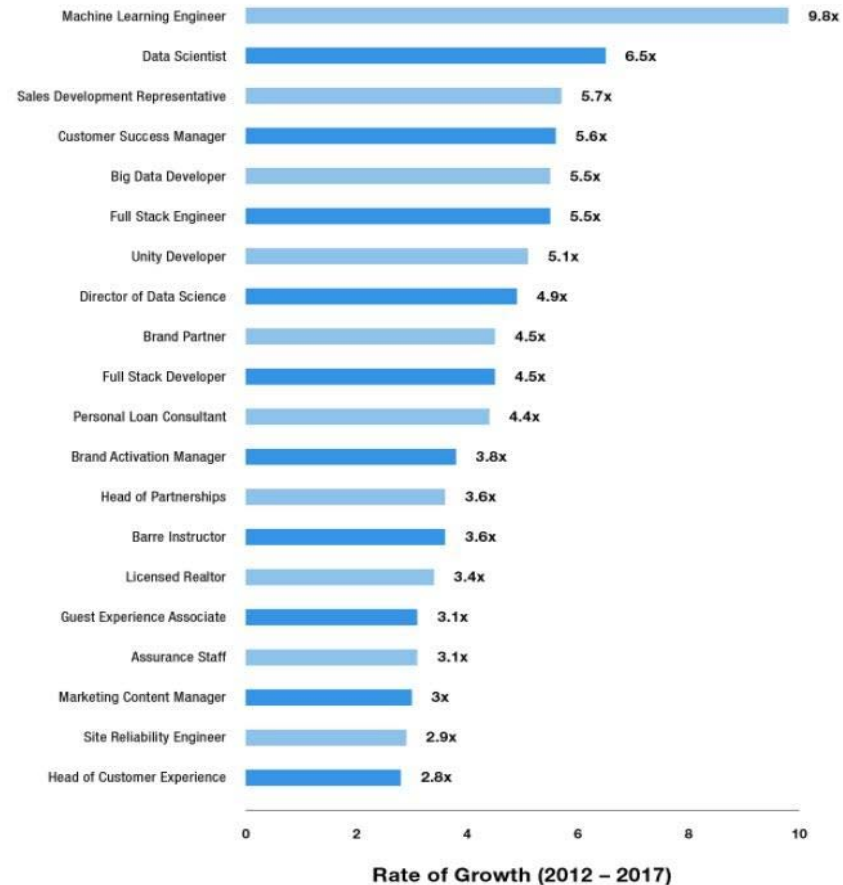# Why study AI, Big Data and Cloud Computing ?
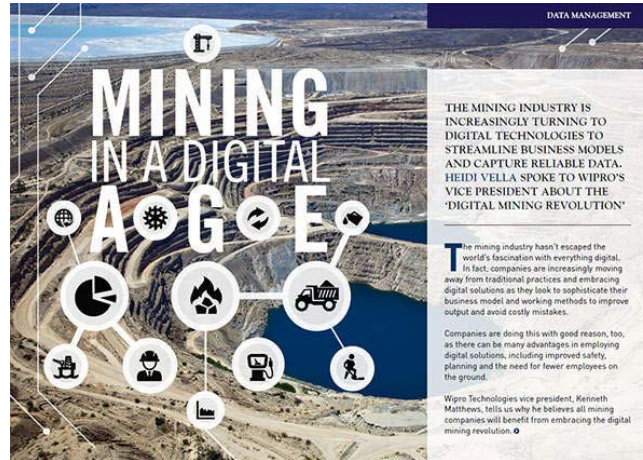
Emerging employment opportunities for AI, Big-Data and Cloud Computing:

- Artificial Intelligence Specialist
- Machine Learning Engineers
- Cybersecurity Specialist/Risk Manager
- Marketing Automation Specialist
- Robotics Engineer (Software)
- Automation Consultant
- Data Scientist/Engineer
- DevOps Engineer
- IoT Architect/Solutions Designer
- Full Stack Engineer

Top 20 Emerging Jobs — LinkedIn Economic Graph

Job	Rate of Growth (2012 – 2017)
Machine Learning Engineer	9.8x
Data Scientist	6.5x
Sales Development Representative	5.7x
Customer Success Manager	5.6x
Big Data Developer	5.5x
Full Stack Engineer	5.5x
Unity Developer	5.1x
Director of Data Science	4.9x
Brand Partner	4.5x
Full Stack Developer	4.5x
Personal Loan Consultant	4.4x
Brand Activation Manager	3.8x
Head of Partnerships	3.6x
Barre Instructor	3.6x
Licensed Realtor	3.4x
Guest Experience Associate	3.1x
Assurance Staff	3.1x
Marketing Content Manager	3x
Site Reliability Engineer	2.9x
Head of Customer Experience	2.8x

How is Swinburne preparing students for these careers?

Multiple degree pathways:

Computer Science: Data Science, Cybersecurity, Internet-of-Things, Network Design

Engineering: Robotics/Mechatronics, Biomedical Engineering

Artificial Intelligence: currently exploring options to ensure students are prepared for growth in this field

Industry-linked Academics, Projects and Placements:

Taught by world-class, industry-linked researchers in Machine Learning, Computer Vision, Cloud Computing, Internet-of-Things, Robotics, Data Science

Industry-linked projects for students: (e.g., Bosch, Telstra, DSTG, RCH Hospital)

Wipro Artificial Intelligence Lab

Industry Advisory Board for course development

Work-Integrated Learning and Industry Placements

2019 Industry Placements

- AI/Data Science
- Robotics/Mechatronics
- Cloud Computing
- Cybersecurity
- Others

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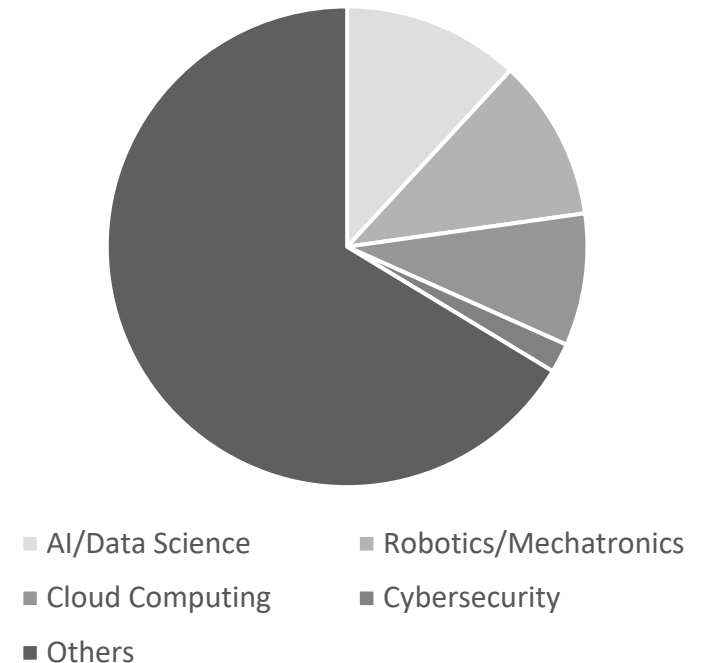
Why is this important to students?

Future-ready Swinburne ICT graduates are:

- Familiar and ready for current technology trends and industry needs
- Ready to adapt to (or drive!) disruption and change
- Equipped with the theory and the practical know-how
- Passionate about applying their skills to enable other industries

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PANEL

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- **DR ALAN COLEMAN, SWINBURNE UNIVERSITY**

- **GABRIEL MGBADIEFE, DXC.TECHNOLOGY**

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