EMERGING AREAS IN IT AND COMPUTER SCIENCE

DR CHRIS MCCARTHY
SENIOR LECTURER, DEPT OF COMPUTER SCIENCE AND SOFTWARE ENGINEERING

Emerging areas in IT and Computer Science Webinar, May 8th 2020

ABOUT ME

cdmccarthy@swin.edu.au

Dr Chris McCarthy:

- Senior Lecturer in Computer Science and Software Engineering
- Director of Industry Engagement, Software and Electrical Engineering

Teaching:

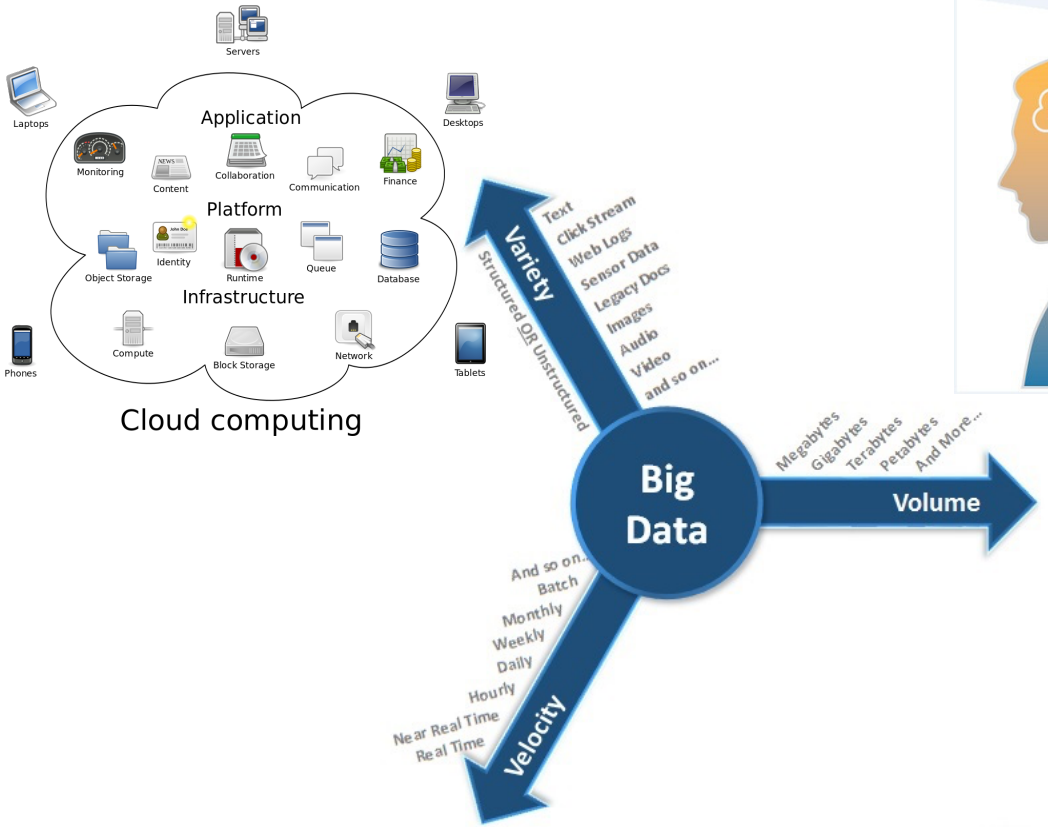
- Software Development
- Computer Systems
- Mobile Development

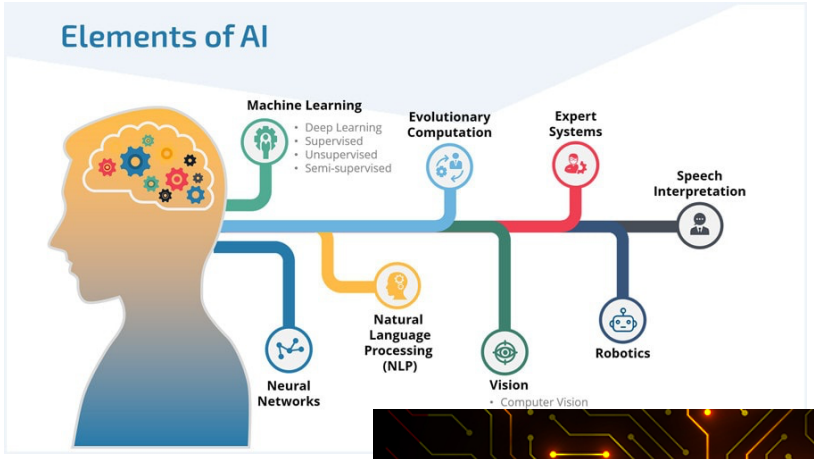
Research:

- Computer Vision and Machine Learning
- Robotics
- Human-Computer Interaction

EMERGING AREAS IN IT AND COMPUTER SCIENCE

"A snap shot of emerging trends in IT and Computer Science, and career opportunities"





SWINBURNE UNIVERSITY OF TECHNOLOGY

Artificial Intelligence

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.

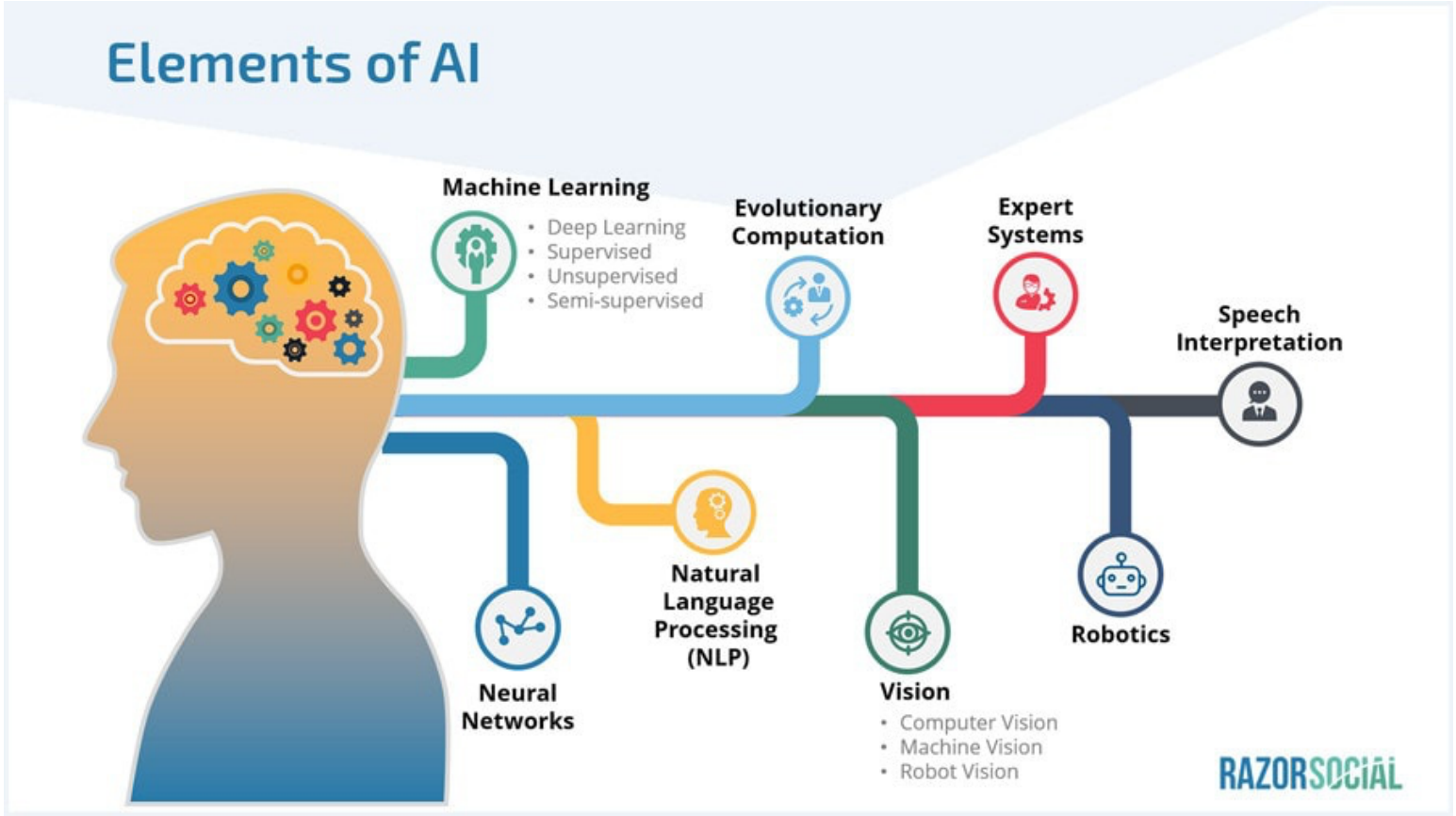
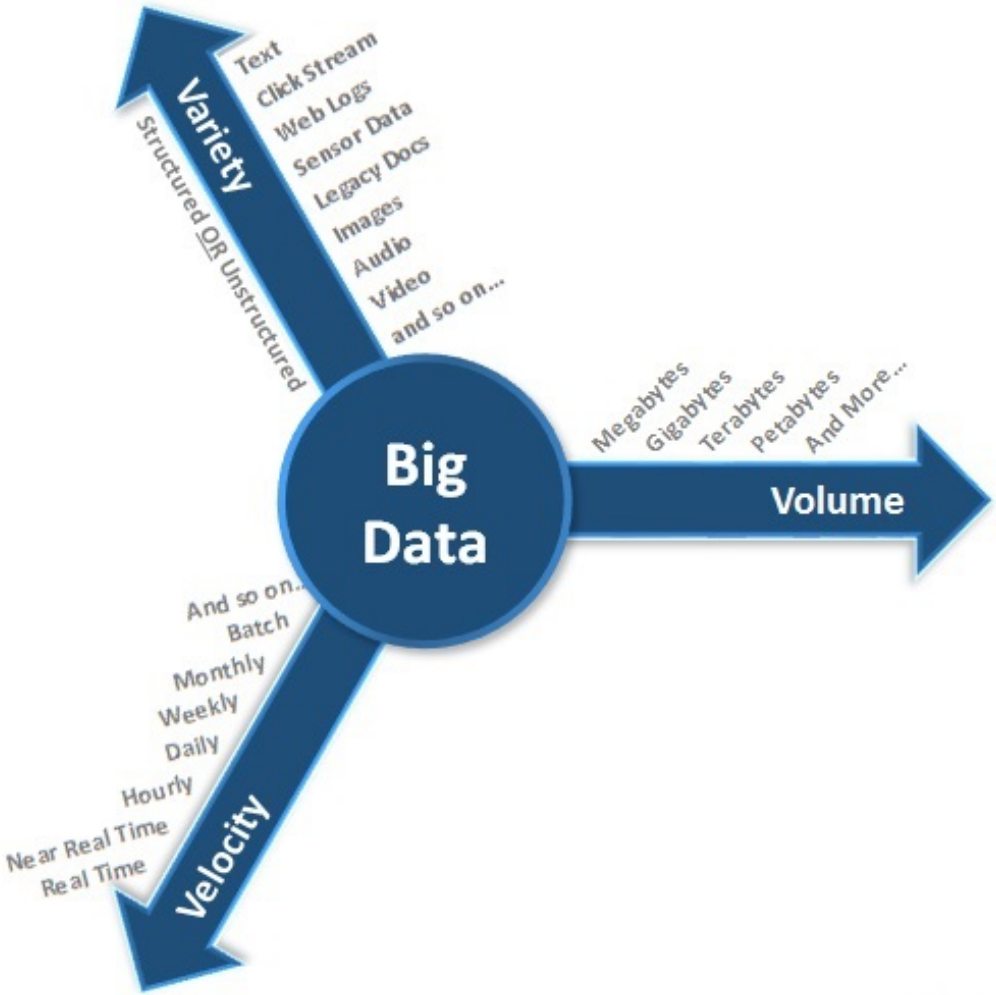


Image source: www.quora.com

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 traditional data-processing application software.

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 …

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

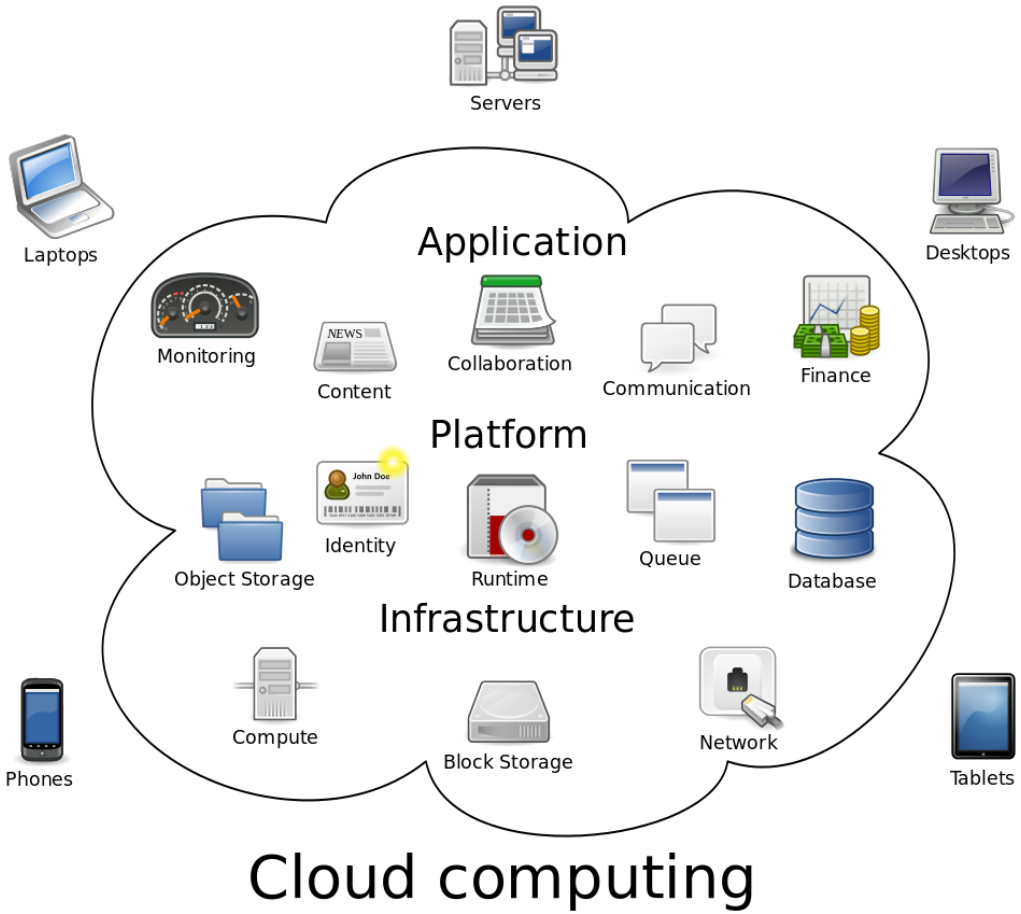


Image src: https://en.wikipedia.org/wiki/Cloud_computing#/media/File:Cloud_computing.svg

Cyber Security

The practice of defending computers, servers, mobile devices and electronic systems from malicious attacks

Application Security

- *Software security (e.g., malware)*

Information Security

- *Secure data storage and retrieval*

Network Security

- *Secure data transfer and communication*

Operational Security

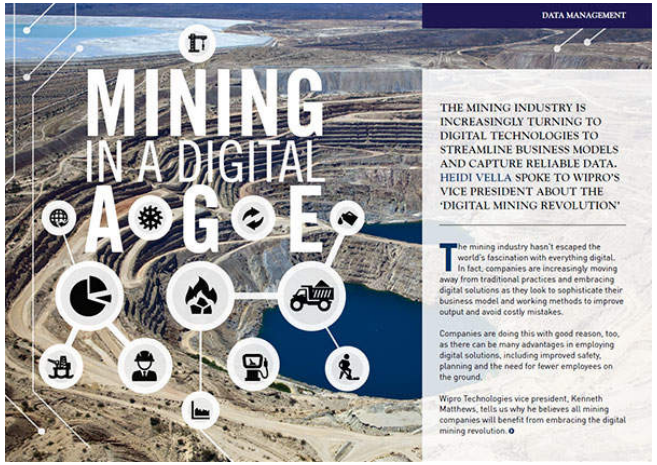
- *Classifying information assets and determining controls*

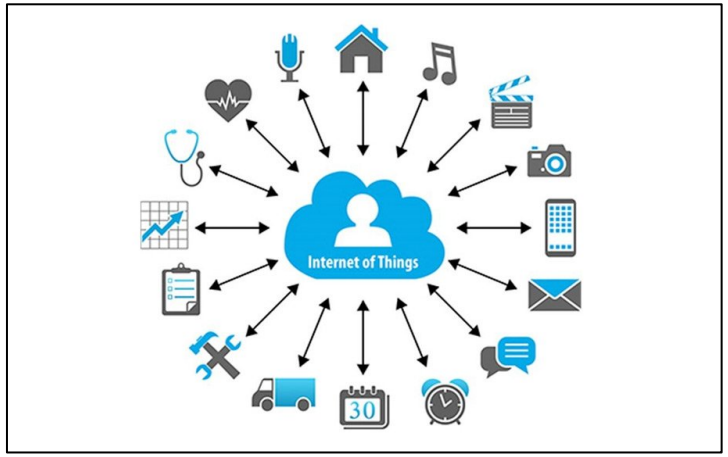
Associated ICT Disciplines:

- Cloud architecture, network design/administration, database management, software development, software testing, computer forensics

Image src: www.airlines.iata.org

Why study IT and Computer Science ?





EMERGING AREAS IN IT AND COMPUTER SCIENCE

IT, Computer Science and COVID-19

The core infrastructure of the global COVID-19 response, and will be central to our path beyond

AI and Data Analytics:

- *AI and Big Data for predicting virus spread, targeting interventions and planning for future out breaks*

Workplace Virtualisation

- Cloud computing to meet a predicted boom in online virtualisation of office/educational operations.

Digital Health and Tele-medicine:

- Already an emerging area, the development of which will likely accelerate in the coming years.

Cybersecurity:

- Ensuring online data communication and storage is secure, as well as servers supporting cloud-based remote work

Software Development

- At the core of it all is software development, and the need for programmers well versed acorss a range of technologies and platforms

There will be a likely demand for specialised skills in these areas as workplaces and organisations adapt to less face-to-face, virtualised settings.

Src: https://sciencebusiness.net/news/computer-science-versus-covid-19

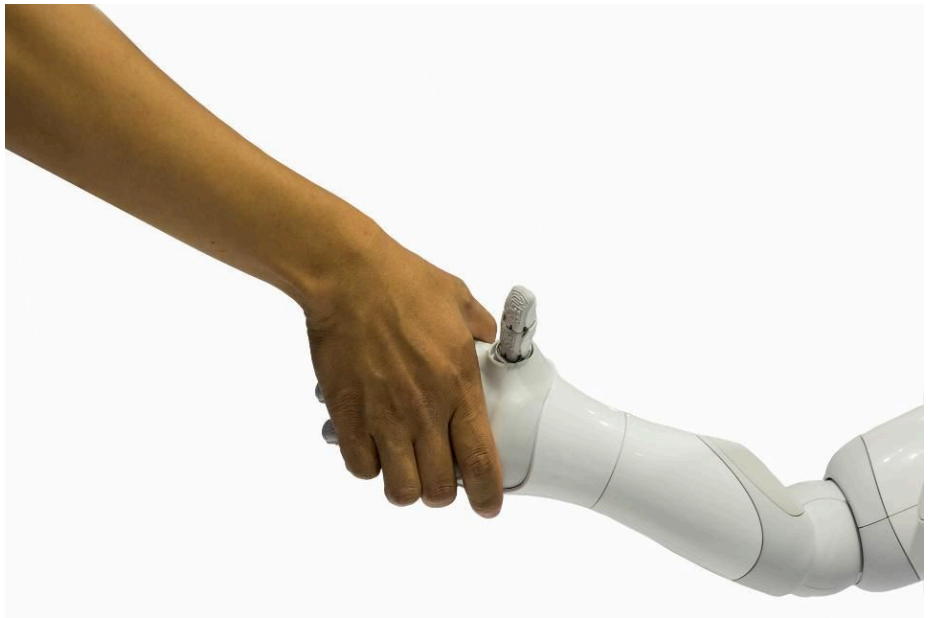
LinkedIn 2020 Fasting Growing ICT Jobs:

- Artificial Intelligence Specialist (#1)
- Cyber Security Specialist (#2)
- Marketing Automation Specialist (#3)
- Robotics Engineer (Software) (#4)
- Site Reliability Engineer (#5)
- Data Scientist (#7)
- Data Engineer (#8)
- Full Stack Engineer (#14)

https://business.linkedin.com/content/dam/me/business/en-us/talent-solutions/emerging-jobs-report/AUS-TOP-EMERGING-JOBS_compressedRevised.pdf

A future-ready ICT /Computer Science graduate is:

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



Computer Science and ICT at Swinburne

Degree pathways:

Bachelor of ICT: Business Systems, Network Technology, Software Technology, etc

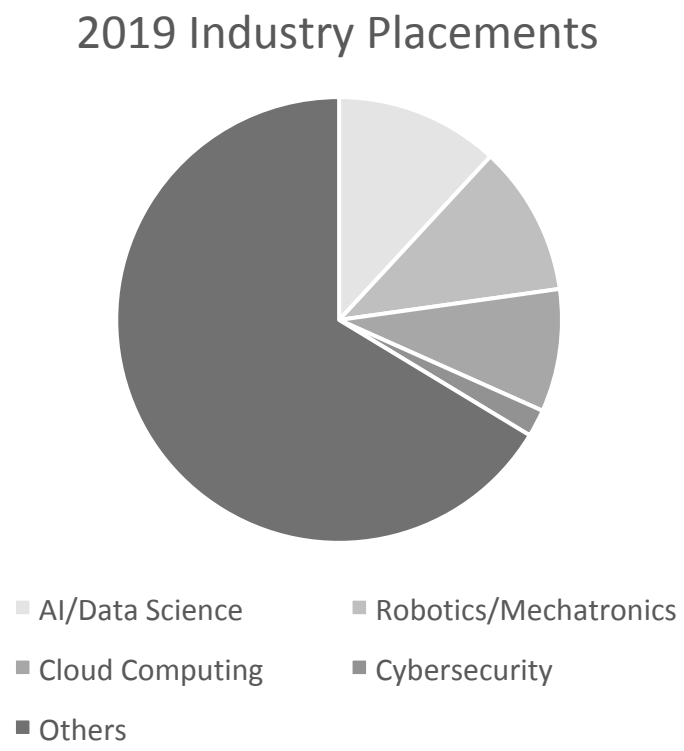
Bachelor of Computer Science: Data Science, Cybersecurity, Internet-of-Things, Network Design

Masters programs: IT, Data Science, Cyber Security

Industry-linked Academics, Projects and Placements:

Industry-linked projects for students: (e.g., Bosch, AWS, Wipro)

Work-Integrated Learning and Industry Placements



THANK YOU