

# **CYBERSECURITY AND DATA SCIENCE**

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### Dr Jason But:

- Senior Lecturer in Telecommunications Engineering and Data Networks
- Deputy Chair, Department of Telecommunications, Electrical, Robotics and Biomedical Engineering
- Course Coordinator: Master of CyberSecurity

### Teaching:

- Internet Protocols
- Unix Systems
- Internet Performance
- Software Defined Networks

### Research:

- Network Protocols
- Software Defined Networks
- Improving Internet Performance

## “CyberSecurity in the News”

CryptoCore hacker group has stolen more than \$200m from cryptocurrency

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Australia sends army to Victoria to fight Covid-19

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keynote presentation Wednesday at the InfoSec World 2020 digital conference.

In essence, the coronavirus has created ideal "crisis" conditions within organizations that

Produced by 50 Media | CyberRisk Alliance Research

One-in-five experiences cyber fraud each year

16 June 2020

GETTY IMAGES

The majority of victims did not report the incident to the police

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Images 'show China structures' on India border

The construction along the disputed frontier is near the site of clashes that killed 20 Indian troops.

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Australia sends army to Victoria to fight Covid-19

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## 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

## Why is it important

- *As we migrate more of our personal lives and data online it becomes more imperative to protect the integrity of that data against theft and/or malicious activities*



Image src: [www.airlines.iata.org](http://www.airlines.iata.org)



“Data Science in the News”

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Intel, Microsoft Use Deep Learning To Detect Malware

By David Curry | June 1, 2020

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**MALWARE ANALYSIS**

Researchers demonstrate how a deep learning algorithm converts malware images, which are recognition algorithms.

Microsoft and Intel have announced a joint project that aims to the application of deep learning to malware analysis.

The project, which is a 12-month, published project, aims to demonstrate a technique that converts malware images, which are scanned by an image pattern recognition algorithm.

SEE ALSO: Microsoft: Our AI 99% Accurate At Detecting Security Flaws

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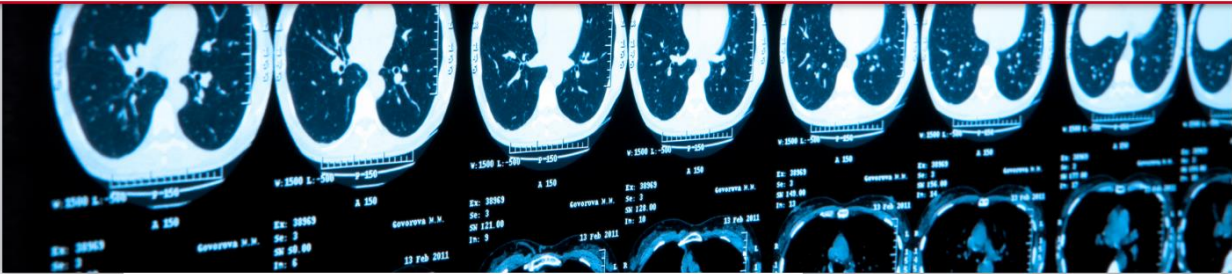
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AI Learns from Lung CT Scans to Diagnose COVID-19

Lesions in the lungs of patients with pneumonia caused by a SARS-CoV-2 infection are distinct from those caused by bacteria.




Claire Jarvis

Jun 10, 2020

Although the initial wave of the SARS-CoV-2 pandemic has abated in many countries, healthcare providers are still looking to identify as many COVID-19 patients as possible and contain the disease. Fast and accurate diagnosis is especially important when unsuspecting patients with a coronavirus infection come to the hospital with health complaints but don't yet show symptoms of COVID-19.

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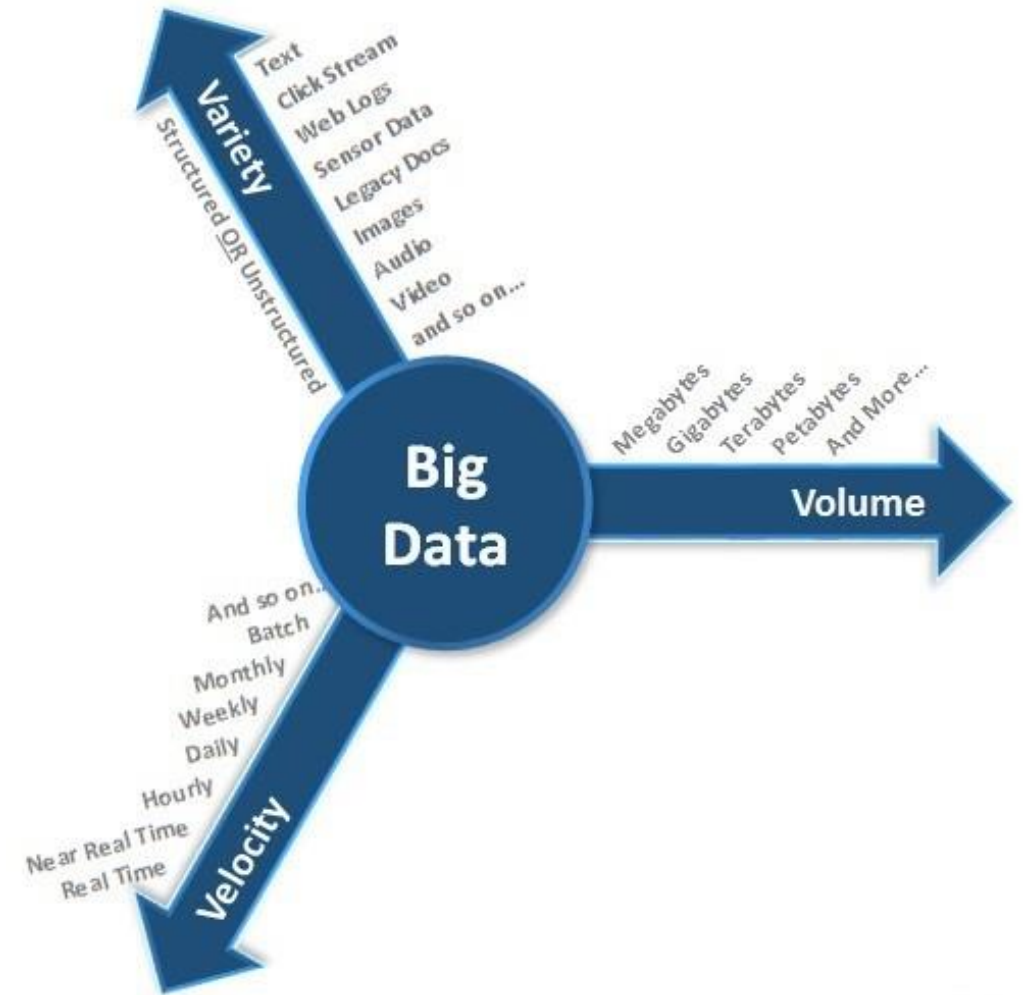
## Data Science

*The analysis, systematic analysis and extraction of insights from data sets that are both large and poorly defined*

How do we extract useful information for decision making from massive, complex, inter-mingled, and unsanitised data sets

## Why is it important

- We are continuously collecting more and more data and it is becoming imperative to develop new ways to manage and access the data to be able to extract useful information*



# IMPACT OF RECENT EVENTS

## COVID-19

*The recent pandemic has caused a giant leap forward in how much we depend on the Internet and its associated applications. This mass influx of users, data, and network traffic has increased awareness of the importance of CyberSecurity and Data Science now and in the future*

### CyberSecurity:

- Growing field even before COVID-19
- Growing trend of business moving online
- More business data not only online, but moving to potentially less secure devices as more people work from home
- General Internet traffic contains more sensitive data, less entertainment
- **How do we protect this?**

### Data Science:

- Also a growing field even before COVID-19
- Recent crisis has increased interest in AI based models
- Models rely on good data, but good data is rare
- Speeding up development of techniques to extract useful analysis from the data we have
- **How can we improve techniques to improve public safety and future business models?**



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

*There is already a global – growing – demand for CyberSecurity and Data Science skills and this is anticipated to grow exponentially as workplaces and organisations adapt to less face-to-face, virtualised settings*

*Expected to be the next major spaces for IT*

## Why Swinburne?

Located in Melbourne  
Highly multi-cultural environment

Internationally recognised



Major IT/Industry hub  
for the Southern Hemisphere

Small University  
More personal student-staff interactions



## Learning and Teaching at Swinburne

Primary Drivers  
Work-ready Graduates  
Hands-on Skills

Student-centred  
teaching pedagogy

Outcome oriented  
Course Design

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Not sessionals

We Care

Industry engaged learning

## Course Features

- 2 year program
- Project-based teaching pedagogy
- 0.75 year equivalent Project Work
- Industry sourced Projects
- Hands on technical skills
- Work with Swinburne CyberSecurity Research Centre
- Industry Placements



## Course Features

- 2 year program
- Project-based teaching pedagogy
- 0.5 year equivalent Project Work
- Industry sourced Projects
- Hands on technical skills
- Industry Placements



# THANK YOU

