Careers opportunities with a degree in Mathematics or Data Science

Dr Craig McNeile
craig.mcneile@plymouth.ac.uk
School of Engineering, Computing and Mathematics

UNIVERSITY OF
PLYMOUTH

The Many Branches of Mathematics

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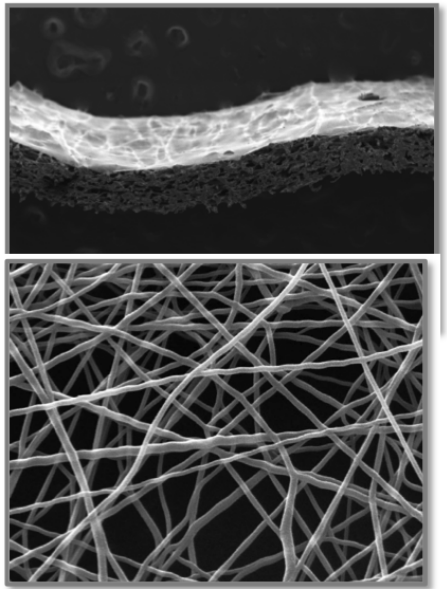

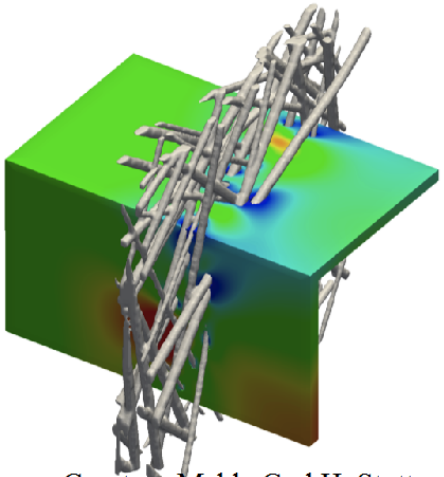

Courtesy Mahle GmbH, Stuttgart

- Applied Mathematics:
  calculus is its language; fluids to finance

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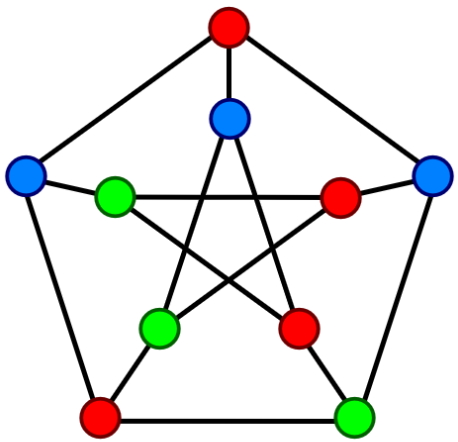

Picture: https://bit.ly/2VzUmHM (public domain)

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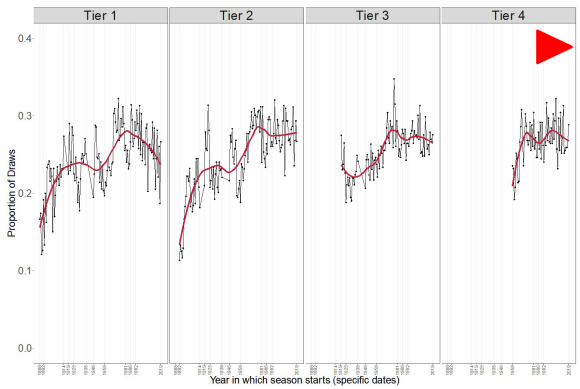

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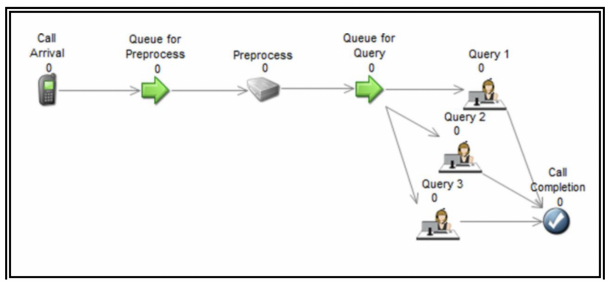

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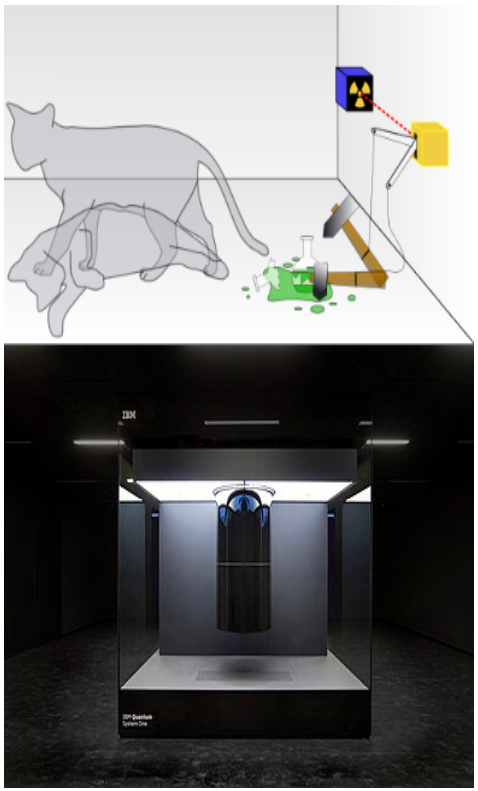

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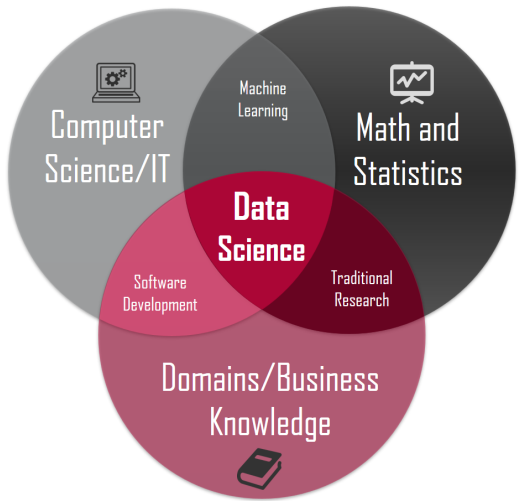
- Communication skills!

Data Science

Next academic year, 2025/26, there are two new programmes:

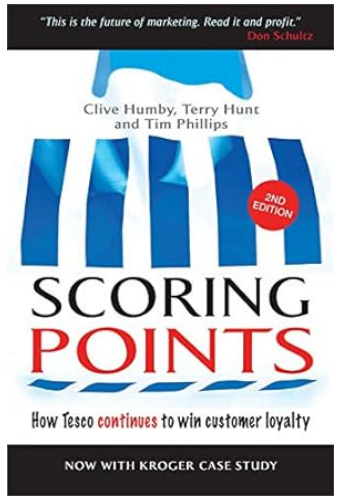
- BSc (Hons) Data Science
- BSc (Hons) Data Science with Artificial Intelligence,

with a mixture of modules from Mathematics and Computing.



Application of Data Science

Data Science is used to increase profits of many companies.



Great Ormond Street Hospital for Children

> *One of the biggest challenges in rare diseases is getting an accurate diagnosis. Many families go through years of uncertainty before they find the right answers. By embracing developments in data science and new technologies, they hope to reduce the diagnostic odyssey*

AI and machine learning

- One machine learning technique is deep learning that is based on mathematics.

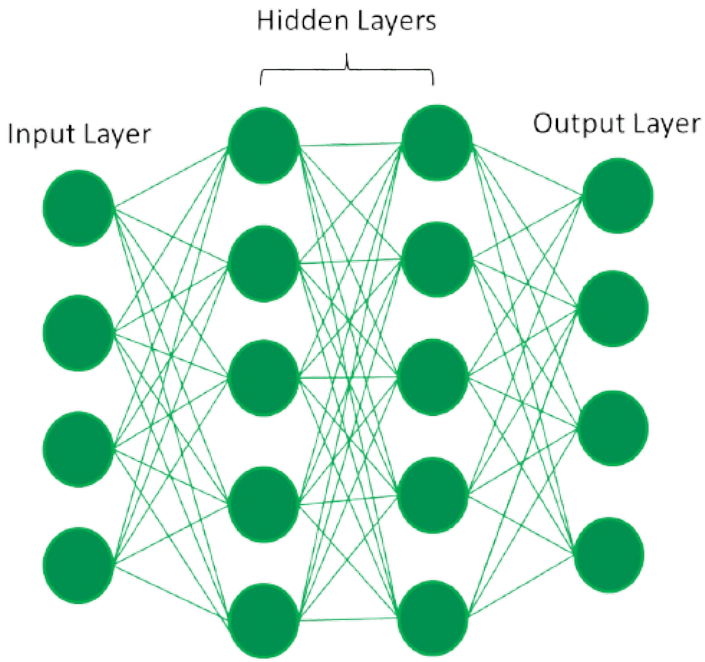


Figure: Deep learning

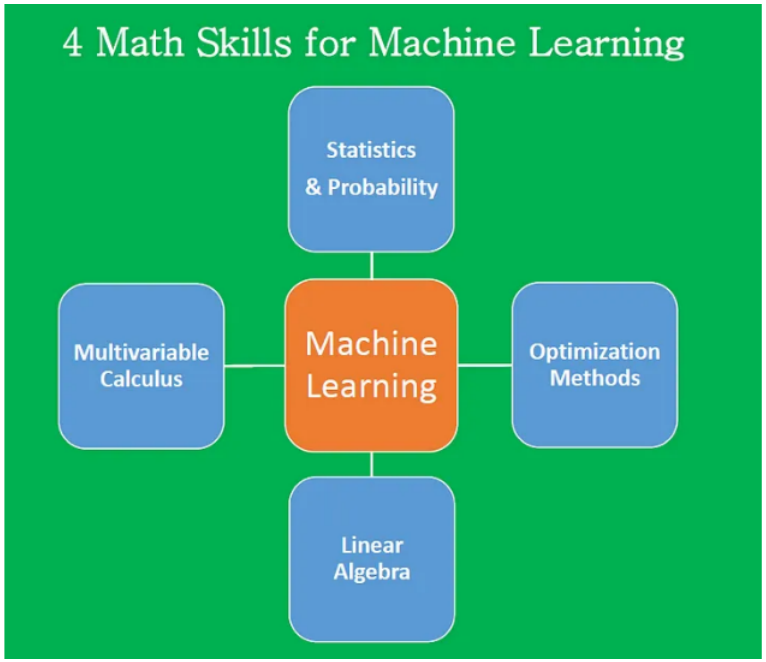
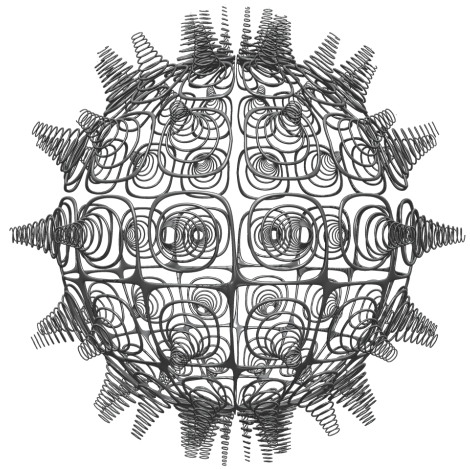


Figure: Mathematics of Machine Learning

Contents?

- First year partly what you expect (calculus, vectors, matrices).
- Much more rigour (proof).
- More choice in final year.
- Assessment: generally 60-80% exam, plus coursework (CW). Some CW-only modules.



Student Support

- Support classes (tutorials, PALS)
- Personal tutor system
- Drop in centres
- Approachable lecturers
- 12 hours of classes (lectures, computer labs etc.) per week.
- Employability sessions delivered by professional Careers Advisors

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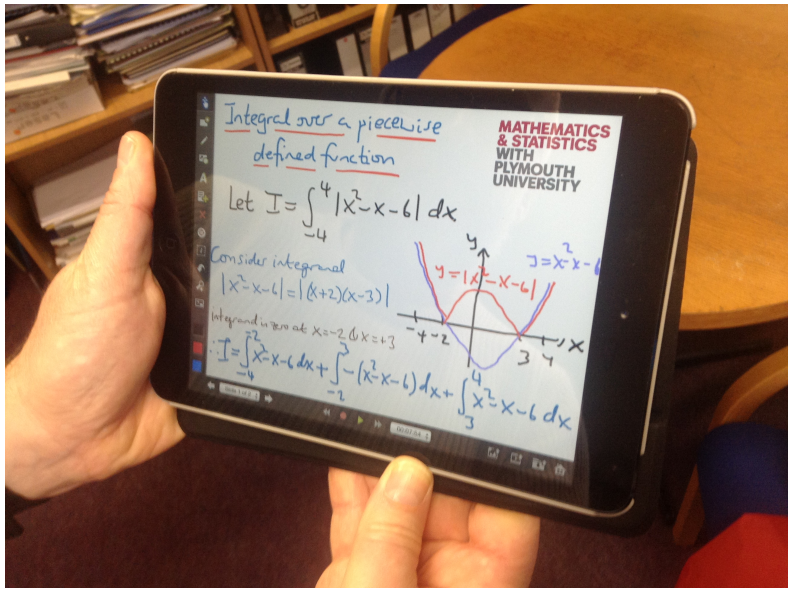


Technology to help teaching and learning:

- lecture notes
- lectures are recorded
- podcasts (by staff and students)
- voting/instant feedback

A Track Record of Satisfied Students

TEF 2023

Overall: **Gold**

Student experience: **Gold**

Student outcomes: **Gold**

Teaching Excellence Framework

Consistent high scores for students' satisfaction. Guardian Mathematics League Table

- 2024: $\mathbf{2^{nd}}$ satisfaction with Mathematics teaching.
- 2023: $\mathbf{2^{nd}}$ satisfaction with Mathematics teaching.
- 2022: $\mathbf{6^{th}}$ satisfaction with Mathematics teaching.

85 % of mathematics graduates, from this school, were working in a graduate jobs after 15 months (Guardian league table 2024)

Placements and Careers

Year long placements (typically earn £20 k)

- Employers include:
  - Mastercard, ONS, DSTL, Met Office
  - Glaxo-Smith-Kline, Eli Lilly...
- Very successful on return

Other placements

- Summer placements in industry.
- Summer internship scheme for undergraduate research projects (£2 k). Funded: LMS, Optometry
- School placement module

Careers events

- Fairs, talks, our own Maths Careers conference.

25 % of employers are using AI to screen jobs applicants.

Careers in teaching

Rebecca Dodge: £25k IMA Teaching Scholarship

Careers in Finance

Daniel Palomeque: Senior Actuarial Analyst, Zurich Australia

Careers in Medical Statistics

Lizzy Goult: Doctoral Researcher, Max Planck Institute for Infection Biology

Careers in Computing and Engineering

Tomasz Szyrowski

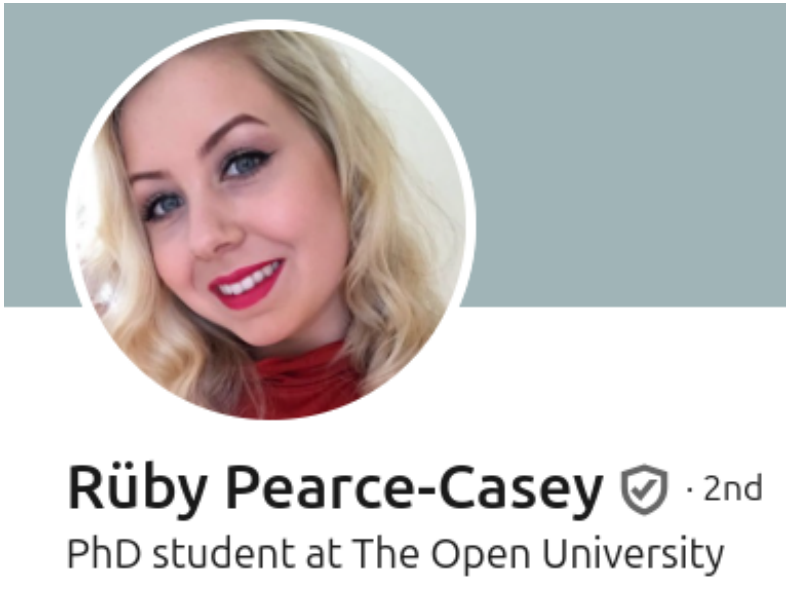
PhD in Marine Engineering

- Mathematical modelling of how to detect undersea cables
- Brand new approach (using Monte Carlo techniques)
- Scientific Software Developer at the Met Office
- Lead Software Engineer at HMRC
- Leading a team in IBM to build high performance custom AI applications

Postgraduate study

A PhD is required to work as a lecturer at a University.

James Mitrussis
MSc student cyber-security at Kings College London
Fully funded by a Martingale Scholarship.

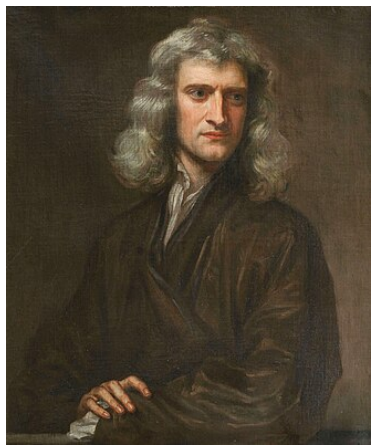


Ruby Pearce-Casey
PhD student at the Open University
Applying deep learning to images from the James Webb Space Telescope.

Final year projects

There is a lot of academic content in the degree. For example, below are a few titles of final year projects.

- Learning Phases of Matter with Neural Networks.
- Algebraic solutions of the hypergeometric equation.
- Elliptic Curve Cryptography: A Mathematical Arms Race.
- Differential geometry and Einstein's Field Equations.
- Using Machine Learning to Diagnose Pneumonia from Covid-19 in Patients from Chest X-Rays



After inventing calculus, mechanics and gravitation, Sir Isaac Newton became the warden of the Royal Mint.

Summary

Mathematics is beautiful and helps you understand the world around you.

> *In 2023, the World Economic Forum found that 'AI and Machine Learning Specialists' and 'Data Analysts and Scientists' roles were in the top 10 jobs expected to grow fastest between 2023 and 2027.*

- Mathematics degrees keep more career options open
- Lots of support during your studies (modern technology)
- Students enjoy our degrees (NSS, Guardian)
- Data Science and Mathematics lead to well paid and extremely interesting jobs