

Imperial Data Science Online Winter School

Engage with Imperial academics “live” online!

Experience team-based learning through a technical project!

1st to 23rd February 2021



I. INTRODUCTION:

Data Science is successfully adding value to all the business models by using statistics and deep learning to make better decisions. A growing number of companies are now hiring data scientists to crunch data and predict possible situations and risk for businesses.

This online winter school is designed for college students studying IT, computing or any engineering degrees at a well-recognised university in China, with an interest in data science. Students will be introduced to the concept, develop an understanding of data science, hear from industry expert on data science applications and work in teams towards a technical project.

Students will:

- Learn the concept of Data Science;
- Develop an understanding of exploratory data analysis, the world of AI and visualization;
- Learn about data science products;
- Understand the real-world applications in data science and hear from industry expert;
- Gain an understanding of data privacy and ethics;
- Learn from research expert in data economy and block chain;
- Talk to leading data science expert to hear advances in data science;
- Develop valuable professional skills in team building, leadership, communication and presentation;
- Experience team-based learning through a technical data science project;
- Practice and improve their English language.

Students will be allocated in project teams to work on a technical project and engage with Imperial supervisors throughout the programme. Example projects include developing a device to detect brain tumour.

In addition, students will have an opportunity to meet and discuss with Imperial ambassadors online, sharing their experiences on what it is like to study in a world class university and to discuss opportunities for future study.

II. PROGRAMME STRUCTURE & FORMAT:

40 learning hours spread over 15 days covering live lectures, workshops, tutorials, project work and self-study time.

Project work will be done through team-based learning with supervision. Final project will be presented in groups to a panel of experts on the last day of the programme. A prize will be awarded to the team presented with the best project.

The programme will be delivered over Microsoft Teams. Online project channels will be allocated to each team for project work and tutorials. Students will be able to use the channel at any time to work on their project.

Live classes of between 1.5 to 2 hours duration will be delivered on weekdays. Some days will have an additional one-hour live tutorial session with a project supervisor. All classes will be delivered between 08:30 to 10:30 UK time / 16:30 to 18:30 China time.

The entire programme will be taught in English.

III. CERTIFICATION:

Students will receive a verified Imperial College London digital certificate on successful completion of the winter school and a prize will be awarded to the best project team. Each student will also receive a transcript for their project mark.

IV. ENTRY REQUIREMENTS:

All students are expected to be studying an degree in any engineering discipline, IT or computing degree at a well-recognised university in China.

English requirements:

All students are required to have a good command of English, and if it is not their first language, they will need to satisfy the College requirement as follows:

- a minimum score of IELTS (Academic Test) 6.5 overall (with no less than 6.0 in any element) or equivalent.
- TOEFL (iBT) 92 overall (minimum 20 in all elements)
- CET- 4 (China) minimum score of 550
- CET- 6 (China) minimum score of 520

Technical knowledge requirements:

As the project has a strong technical element, students are expected to have the following technical knowledge and interest:

- Interested in computer visualisation / natural language processing;
- Have at least intermediate level at one of the common programming languages (Python, Java, C ++, etc.);
- Have mathematical foundation (probability theory, linear algebra, etc.);
- Have an understanding of the Linux environment;
- Knowledge of Machine Learning knowledge with experience in using PyTorch / Tensorflow / Keras.

Students will need to have access to a computer pre-installed with python, have a webcam, microphone and good internet connection to attend the live classes.

IIV.COST:

The cost of the programme is £1600.

V.TEACHING FACULTY

The winter school is directed by Prof. Yike Guo and taught by a multi-disciplinary teaching faculty from the Data Science Institute and other departments.



Professor Yike Guo
Co-Director of the Data Science Institute
Professor of Computing Science
Imperial College London

Yike Guo, is a Professor of Computing Science in the Department of Computing at Imperial College London. He is the founding Director of the Data Science Institute at Imperial College. He is a Fellow of the Royal Academy of Engineering (FREng), Member of Academia Europaea (MAE), Fellow of British Computer Society and a Trustee of The Royal Institution of Great Britain.

Professor Guo received a first-class honours degree in Computing Science from Tsinghua University, China, in 1985 and received his PhD in Computational Logic from Imperial College in 1993 under the supervision of Professor John Darlington. He founded InforSense, a software company specialized in big data analysis for life science and medicine, and served as CEO for several years before the company's merger with IDBS, a global advanced R&D software provider, in 2009. He was then the Chief Innovation Officer of the IDBS until 2018. He also served as the Chief Technical Officer of the tranSMART foundation, a global alliance in building open source big data platform for translational medicine research.

He has been working on technology and platforms for scientific data analysis since the mid-1990s, where his research focuses on data mining, machine learning and large-scale data management. He has contributed to numerous major research projects including: the UK EPSRC platform project, Discovery Net; the Wellcome Trust-funded Biological Atlas of Insulin Resistance (BAIR); and the European Commission U-BIOPRED project. He was the Principal Investigator of the European Innovative Medicines Initiative (IMI) eTRIKS project, a €23M project building a cloud-based informatics platform, in which tranSMART is a core component for clinico-genomic medical research, and co-Investigator of Digital City Exchange, a £5.9M research programme exploring ways to digitally link utilities and services within smart cities.

Professor Guo has published over 250 articles, papers and reports. Projects he has contributed to have been internationally recognised, including winning the “Most

Innovative Data Intensive Application Award” at the Supercomputing 2002 conference for Discovery Net, the Bio-IT World "Best Practices Award" for U-BIOPRED in 2014 and the "Best Open Source Software Award" from ACM SIGMM in 2017.



Photos above: Data Science Institute 360-degree observatory and Professor Yike Guo hosting a visit for President Xi Jinping in October 2015.

Imperial Data Science Online Winter School, start from 1th February 2021

| Week 1 | Monday | Tuesday | Wednesday | Thursday | Friday |
|---------------------------|---|---|--|--|--|
| 8:30-11:00 UK Time | Welcome and Introduction to Imperial College London | The world of Artificial Intelligence -first-hand experience | The world of Artificial Intelligence -first-hand experience II | Team Building and Leadership | Data Visualization |
| 15:30-18:00 China Time | Programme overview | Group Project Briefing and Planning | | | |
| | Data Science Introduction | <i>Self-study: students work on project in channels</i> | <i>Project tutorials Q & A</i> | <i>Self-study: students work on project in channels</i> | <i>Self - study : students work on project in channels</i> |
| Week 2 | Monday | Tuesday | Wednesday | Thursday | Friday |
| 8:30-11:00 UK Time | Data Science Products | Machine Learning for Data Science | Exploratory Data Analysis | No class for Chinese New Year's Eve | No class for Chinese New Year |
| 15:30-18:00 China Time | <i>Self-study: students work on project in channels</i> | <i>Project tutorials Q & A</i> | <i>Self-study: students work on project in channels</i> | | |
| Week 3 | Monday | Tuesday | Wednesday | Thursday | Friday |
| 8:30-11:00 UK Time | Effective Communication for Presentation | Data Privacy & Ethics | Data Science and Application - Industry perspective | Data Economy and Block Chain | Advances in Data Science |
| 15:30-18:00 China Time | <i>Project tutorials Q & A</i> | <i>Self-study: students work on project in channels</i> | <i>Project tutorials Q & A</i> | <i>Self - study : students work on project in channels</i> | <i>Project tutorials Q & A</i> |
| Week 4 | Monday | Tuesday | | | |
| 8:30-11:00 UK Time | Opportunities for International Student | Project presentation | | | |
| 15:30-18:00 China Time | Q & A with Imperial student ambassadors | Students to complete online evaluation | | | |
| | <i>Project tutorials Q & A</i> | Announcement of winning team | | | |

* Note: The above is the reference itinerary, which might be adjusted according to the actual situation.