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| 项目名称 | 2021 寒假英国帝国理工学院数据科学在线交流项目   |
| 项目介绍 | <p>帝国理工学院（Imperial College London），全称 Imperial College of Science, Technology and Medicine，成立于 1907 年，位于英国伦敦，是英国罗素大学集团成员、金砖五校之一、欧洲 IDEA 联盟成员，是一所主攻理学、工学、医学和商学的世界顶尖公立研究型大学。帝国理工学院在国际学术界有着顶级声望，是世界最具创新力大学之一，在 2021QS 世界大学排名中名列世界第 8 位，其研究水平被公认为英国大学的三甲之列，尤其以工程专业而著名。</p> <p><b>受全球疫情影响，2021 寒假帝国理工数据科学交流项目将在线上举行。</b>该项目由帝国理工学院数据科学研究所（Data Science Institute，帝国理工学院六大全球研究所之一）创始所长、英国皇家工程院院士郭毅可教授领导并亲自授课，授课老师还包括帝国理工相关学院其他教授、研究员，及 1 位特邀数据科学相关行业从业者。项目结束后，参与学员将获得由帝国理工校方颁发的证书及成绩证明。</p> |
| 项目时间 | 2021 年 2 月 1 日-2 月 23 日   |
| 项目安排 | <p>项目共计 40 学时，参与学员将学习数据科学、人工智能、机器学习等主题课程，同时将在指导下以小组形式完成一个专业项目（往期举例：Brain Tumour Detection）。</p> <p>项目期间还将安排和帝国理工招生官及帝国理工在校学生进行线上交流活动。所有授课和辅导均将通过网络。具体请查看项目介绍和课程安排表。</p>   |
| 项目费用 | <p>项目费用：1600 英镑<br/>         奖学金席位：1200 英镑</p> <p>*帝国理工学院将为优秀学员提供奖学金席位，申请奖学金席位的同学，请在报名的同时，提交一份 500 字以内为英文个人陈述，并邮件发送至 p.huang@imperial.ac.uk</p>   |
| 申报条件 | <p>1、对数据科学有相应背景知识及强烈学术兴趣；<br/>         2、至少熟悉一门编程语言；<br/>         3、能熟练使用英语学习交流。</p> <p>*注：帝国理工项目组将依据申请人提交材料进行审核或面试，择优录取，最终录取结果由帝国理工决定。</p>   |
| 附件   | <p>1. Imperial Data Science Online Winter School flyer 2021<br/>         2. 往期回顾_Imperial Data Science Summer/Winter School</p>   |

## **Imperial Data Science Online Winter School**

*Engage with Imperial academics “live” online!*

*Experience team-based learning through a technical project!*

**1<sup>st</sup> to 23<sup>rd</sup> 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 transSMART 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 transSMART 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 1<sup>th</sup> February 2021

| Week 1                    | Monday  | Tuesday   | Wednesday  | Thursday   | Friday   |
|---------------------------|---|---|--|--|--|
| 8:30-11:00<br>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<br>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 &amp; 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<br>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<br>China Time | <i>Self-study: students work on project in channels</i> | <i>Project tutorials Q &amp; A</i>                          | <i>Self-study: students work on project in channels</i>        |  |  |
| Week 3                    | Monday  | Tuesday   | Wednesday  | Thursday   | Friday   |
| 8:30-11:00<br>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<br>China Time | <i>Project tutorials Q &amp; A</i>                      | <i>Self-study: students work on project in channels</i>     | <i>Project tutorials Q &amp; A</i>                             | <i>Self - study : students work on project in channels</i> | <i>Project tutorials Q &amp; A</i>                         |
| Week 4                    | Monday  | Tuesday   |  |  |  |
| 8:30-11:00<br>UK Time     | Opportunities for International Student                 | Project presentation  |  |  |  |
| 15:30-18:00<br>China Time | Q & A with Imperial student ambassadors                 | Students to complete online evaluation                      |  |  |  |
|                           | <i>Project tutorials Q &amp; A</i>                      | Announcement of winning team                                |  |  |  |

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