

Teaching Statement

Previous Experience

Syllabus and materials of delivered and prepared courses and research projects are available or will be available soon at chengjiawang.github.io/teaching¹.

Since the beginning of my research fellow work and until today (2016-2021), I developed and maintained several internal and external collaborations² at a time when there were no other links between our department and many of these prestigious collaborators. I've been exposed to abundant opportunities of lecturing and tutoring students pursuing different degrees, especially through the close interactions with IIAT-Hangzhou, Imperial College London and Sun Yat-sen University. I have also been frequently delivering classes or seminars to audiences with a wide range of educational backgrounds and for different objectives of study.

IIAT Training Course

Through contracted collaboration with IIAT-Hangzhou, I developed "Introduction to Machine learning and Deep Learning (Deep learning 101)" and "Data Science in Biomedicine" courses. These modules belongs to their commercial training programs open to final year undergraduate and postgraduate students, and other customers planning to develop a career in artificial intelligence. Hence in practice, I teach both undergraduate and postgraduate students.

Internal Teaching

Besides the seminars and workshops I gave to my BHF colleagues every month, for the first two year (2016-2018), I helped a colleague (Dr. Giorgos Papanastasiou) in his two Lecture modules and workshops "Modern Quantification techniques in medical imaging" and "Tomography Basics", providing contents about data science and machine learning. Similarly between 2018 and 2020, I helped to add deep learning in image reconstruction and post-processing lecture notes and practices to the "MRI Quantification", "PET Quantification" and "Tomography Basics" modules for the same master course. This Medical Physics course is part of an MSc in Nuclear and Particle Physics, whilst it is also available to undergraduates taking a Physics BSc or MPhys degree.

Supervision of Research Students

While collaborating with Prof. Heye Zhang from Sun Yat-sen University and Dr. Guang Yang from Imperial College London, I helped design research modules for master students and designed final year research projects. Last year (2018-2019), I worked with an excellent MSc student (Shizhou Dong) doing his final project with me, working on label-efficient dual GAN models. A highly impact journal paper has been published and part of this work is currently being prepared for another journal publication. This year (2019-2020), I continue to help Prof. Zhang design new research modules for a PhD studentship (Ms Jinyu Hao) on generative AutoML models.

Since the first year, my Lectures and supervision received excellent feedback from the collaborators and course directors. I currently expand my teaching and research activities through these collaborations, submitting a research proposal including a PhD studentship with Dr Guang Yang, initially to attract funding from EPSRC and Horizon funds.

Teaching Philosophy

I believe that there are two main challenges that need to be tackled in modern Lecturing practices. The first one is the rapid speed of science and technology evolvment, versus the necessity to obtain thorough knowledge. The second one is the high degree of specialisation, versus the need to have academics and professionals with broad background knowledge who need to be active across multiple fields.

1. Part of the IIAT training courses are confidential due to existing agreements
2. Including academic collaborators, such as, colleagues in QMRI, IDCOR Edinburgh, Sun Yat-sen Univ., NHLI of Imperial College, UCLA, etc., as well as industrial partners, such as, RTCIInnovation UK, IIAT-Hangzhou, Alladin Healthcare, etc. Please refer to the "Professional Activities" section of my CV for more details.

In my Lectures, from day 1, I aim to tackle these two challenges in an interactive, step-by-step mode. First, I always present the fundamental theories and mathematical principles in a Lecture subject. My second consideration is to balance the theory against practical examples for students to understand how the taught techniques can be implemented in research and in the industry. Third, I always leave time at the end of each Lecture, to go through questions, answers and concerns. Fourth, I keep notes about important points highlighted during the course which I then bring for discussion in workshops. Fifth, I always organise workshops for students to be able to be trained real-time in programming and computational analysis tasks, asking them to address and respond to questions of varied degree of difficulty. This way, I am able to simulate in workshops exams questions thus, students know what to expect in terms of material, theory versus programming tasks, and degree of difficulty. Sixth, my principle is to interact with the other Lecturers of the course, in order to jointly improve the Lecture materials and to make complementary information coherent for a successful BSc or MSc course. Last but not least, I consider very seriously the feedback received from the students and I adapt my Lecture courses accordingly for the next year, in coordination with the Course Directors and the philosophy of the department.

I also believe that my role is to inspire students to learn and to be actively engaged during the Lectures and workshops. I always spot and emphasise to students modern challenges in the research and the industry, in order for them to be able to build their own aspirations and visions for the field. Furthermore, I am aware of the fact that some of the students will be interested to develop a career in academia, whilst others would aim to work as industry professionals. It is my belief that both academia and industry realise the need to recruit people with broad and solid knowledge who are able to specialise. Encouraging students to meet me for in-person discussions and interact with me through emails or the phone, is a standard way for me to maintain an open communication and to be able to address students' needs.

5 Year Future Teaching Plan

I strongly believe that I will contribute substantially well to your undergraduate and postgraduate module teaching, as for example in courses on Scientific Computing, Data Science in Biomedicine, Introduction Machine Learning/Deep Learning, Pattern Recognition, or other subdivided areas of AI, computer vision and Data Science, and to your aspiration to create new collaborations within your University, nationally and abroad.

I am a person that have a genuine interest in applying forefront machine learning techniques to practical engineering systems, and I am particularly interested on how we can develop and apply different techniques to address realistic problems, for example, in Biomedicine, Cyber-physical systems, or robotics. If possible, I am particularly interested to keep a balance between teaching theoretical courses of AI, machine learning and data science as well as to translate method development on more Applied Informatics courses. By character, I like to preview opportunities for collaboration and to solidify links and collaborations, in order to enhance multi-disciplinarity and lead opportunities for innovation.

Thus, developing collaborations between your department and other Schools within the University that work on human and animal health, I will be able to disseminate my work on AI and machine learning through Lectures, seminars and presentations. These activities would allow me to explore interdepartmental interactions that will benefit students from either site in receiving solid training and broad inter-disciplinary teaching experiences. Following my previous experience in supporting my Lectures with workshops and tutorials, as well as in inviting other Guest Lecturers with International reputation in some of my courses, I would aim to develop a creative environment for students to interact and to actively contribute in making the course successful.

Finally, I would like to express my sincere will to become a dedicated Lecturer at your department, highly committed to perform according to the highest teaching standards and to support and increase further your highly recognised reputation.

Chengjin Wang
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