Teaching Statement

Teaching is essential to academic life and should never be dismissed as an afterthought. Academics cannot succeed without the ability to clearly, succinctly explain their ideas. In particular, they should be able to communicate with non-experts; teaching provides the perfect opportunity to develop this skill. Teaching should be engaging and stimulating for students. From my experience teaching, and as a student, I've found that grounding content into practical real-world examples, providing hands on work, and covering state-of-the-art methods and ideas are key ways to achieve this. An indicator of a teacher's success is the questions they receive from students. If a teacher receives novel, challenging questions, the students have understood the material and are engaging with it critically. This should be the ultimate goal of teaching, and is what I aim for. This is particularly applicable to postgraduates, who we should teach to view the world with a critical eye and develop original ideas. I'm early in my teaching career, but look forward to developing interesting and entertaining teaching methods through an active dialogue with students.

In the past two academic years, I have given lectures and tutorials on multi-robot planning under uncertainty for the Advanced Robotics course. In the 2023-2024 academic year, I also designed a 20 mark exam question for the course based on my lecture content. I gave an extended version of this lecture as a half-day tutorial at the 2023 International Conference on Autonomous Agents and Multi-Agent Systems. In these lectures I presented the material from a designer's perspective: given a real world problem a student may receive in academia or industry, which techniques are most appropriate and why? The aim here was not to overload students with theory, but to get them to engage with the trade offs between different techniques, and when some may be more appropriate. During my PhD I led the University of Oxford's RoboCup team[1] for two years. Though not directly teaching, this required recruiting, training, and transferring knowledge with undergraduate students. These students often had no prior robotics experience, and in some cases, little programming experience. Students had to learn the basics quickly to make meaningful contributions to annual competitions. This was achieved through lab sessions, tutorials, and by splitting more specific training into separate sub teams. Managing and training the team developed leadership and communication skills which will transfer to teaching and leading modules. In 2020, I worked as a TA for a week-long robotics course aimed at first-year CDT students. Here I helped develop practical assignments which balanced between challenge and feasibility within the limited course duration. These assignments had to fit together to form a final real robot trial the students would run at the end of the week. This crash course helped me understand how to approach complex topics in a way that is easily digestible for students with a limited time to understand it.

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[1] https://ori.ox.ac.uk/student-teams/team-orion/

With my prior experience, I'm confident in my ability to independently lead modules and design exams/continuous assessments etc.

I believe in teaching undergraduates by application. Though any module will contain its fair share of theoretical content, in my experience this content is much easier to digest if grounded in real world examples, or applied through hands-on practical work. This approach also applies to how I approach continuous assessment and exam questions. Not only does this better prepare students for their future careers, I believe it makes learning a much more enjoyable experience. Learning is also made more enjoyable when the teacher is enthusiastic and enjoying teaching, and I think my approach and personality aligns with this. I've supervised many undergraduate, masters, and internship projects. I've also helped design multiple of these. I've learned how to develop ideas that are sufficiently contained while remaining interesting and intellectually stimulating for the student. I approach undergraduate supervision similarly to PhD supervision, as I describe below. I want to treat supervision as a dialogue with the student rather than tell them directly what to do. With this, I want to help students think critically about their work to develop interesting solutions, preparing them for their future careers in industry or academia.

Though early in my career, I am beginning to develop my supervision style based on my experience as PhD student and as a supervisor. I'm currently on the supervision team for two students, one at UoB, and on at the Italian Institute of Technology (IIT). Though supervision style will of course be tailored to the student, there are core principles I find to be helpful. It is important to help students in structuring their PhD to allow a sense of progress. Progress is essential to maintaining morale and wellbeing during a PhD, which is an endurance challenge. I find a practical, incremental approach to research can help with this. This does not necessarily refer to research output, but in how to tackle and solve research problems. There is a tendency for PhD students (myself included) to try and find a perfect solution straight away. This is rarely possible, or at least not immediately visible. Instead, trying to tackle a problem incrementally helps a student learn and understand the problem, even if a different final approach is used. This can be particularly at the start of a PhD, particularly in more practical fields like robotics. Understanding the relevant literature is an essential starting point, but it can really help development to be working on something practical in the mean time, using state-of-the-art methods as a jumping off point, for example. A PhD should not only be about research, but should also be an opportunity for students to develop their soft skills such as communication. I want to help students in developing their writing and presenting skills through opportunities such as summer schools, doctoral consortia etc. PhD supervision should also be a two-way process, and a supervisor should always be receptive to learning from their students.