Teaching Statement

I see teaching as a core responsibility of an academic position and value it as a rewarding aspect of my professional career. I strongly believe that teaching is a way of giving back to the academic community and the society in general.

Teaching Philosophy

My personal vision in teaching is built primarily on the following two pillars :

i) Facilitating learning catered to students' background and their academic level – I work hard to ensure that my teaching and supervision involve multiple learning modalities so that students can learn through their preferred learning style. I also tailor my teaching style and content to the specific needs and background of my students. For example, if I am teaching machine learning to second year Computer Science master's students, I would incorporate strategies from challenge-based learning paradigm via first teaching students the Big Idea, then assisting them to investigate and formulate a challenge, and finally guiding them toward scientific solutions to the identified challenge. On the other hand, if I am teaching machine learning to second year Industrial Design bachelor's students, I would use more conventional instructional teaching with regular assignments to develop their basic understanding of the topic.

ii) Inclusive and accessible education – Research has shown that students perform better when diverse socio-cultural backgrounds of students are recognised and embraced within educational institutions. It is also worth noting that an inclusive approach not only improves the performance of students from underrepresented communities, but that of other students as well [1]. Thus, in order to provide diverse and inclusive teaching and supervision, I act according to the following guidelines [2] –

- Establish and support a climate that fosters belonging for all students.
- Set explicit student expectations.
- Select module content that recognises diversity and acknowledges barriers to inclusion.
- Reflect on one's beliefs about teaching to maximize self-awareness and commitment to inclusion.
- Design all module elements for accessibility.

For example, I like to color-code important aspects in the lecture slides to highlight them and link them to previous ideas. However, this might be inaccessible for color-blind students, so I make sure to use other ways to highlight.

Teaching Interests

I have a broad set of teaching interests and I am able to teach modules that extend beyond my core research focus to a wide class of students. At the University of Birmingham, I would be particularly interested in teaching the following modules : Mathematical Foundations of Artificial Intelligence and Machine Learning, Current Topics in Artificial Intelligence and Machine Learning, Artificial Intelligence, Machine Learning and Intelligent Data Analysis.

Teaching and Supervision Experience

Currently, I am working toward obtaining University Teaching Qualification (UTQ/BKO) which is regarded as a proof of the competence of teaching in academic settings in the Netherlands. I have completed a number of pedagogical modules e.g., Teaching Skills, Designing modules and Projects, Facilitating Learning, Supervision of PhD Students.

In the last quartile, I taught the following two master's modules :

i) Reinforcement Learning as a responsible lecturer (35 students) – I designed the module independently and developed all the teaching materials including lectures, assignments and additional resources on Canvas. Furthermore, I planned and conducted all the teaching, supervision and assessment activities.

Learning objectives were that the students will be able to formulate various reinforcement learning problems mathematically, devise solution strategies for them and prove performance guarantees for these solutions. This module was designed following the challenge-based learning paradigm and the students were assessed based on their group projects. A group project involved identifying a gap in

the literature, formulating a problem, proposing a novel solution with proven performance guarantees and writing a report about their work. Currently, I am guiding one of the groups in this module to submit their project work to a conference.

The student evaluation for this module was highly positive, however I have identified an area of improvement – an optional online pre-test before the module for the students to assess their prerequisite skills and knowledge for the module. After completing the test, the students will be given model solutions and further reading materials related to each question. Thus, students will be able to review and possibly refine the skills and knowledge which will help them throughout the module.

ii) Embodying Intelligent Behavior in Social Context as a co-lecturer (41 students) – Learning objective was that the students will be able to use machine learning algorithms as a design tool for creating an interactive and explainable system within educational/health context. In my lectures, I taught about various machine learning algorithms and gave a practicum on their use. This module was offered by the department of Industrial Design, and therefore most of the students attending the module did not have much background in computer science. This gave me an opportunity to tailor the content as well my teaching style to a wider class of students. A few of the students from this module worked on a project aimed at assisting presenters improve their body language during presentations and we are in the process of submitting this work to a conference. Another group worked on a recommendation system for cardiac rehabilitees using simulated data and we are in the process of extending this project using real data.

In the upcoming quartile, I am going to be a co-lecturer in a bachelor's module on machine learning. Furthermore, I am going to design and deliver a number of tutorials on statistical learning theory for bachelor's students from the Honors academy at Eindhoven University of Technology.

During my master's education, I was a teaching assistant for 4 bachelor's modules, namely – Data Mining, Introduction to Machine Learning, Computational Engineering and Introduction to Research (with class sizes varying from 20 to 100). My duties included designing and delivering lectures, meeting the students during office hours, and setting up online as well in-person examinations.

Currently, I am a co-supervisor for 2 PhD students and 3 master's students with thesis topics ranging from reinforcement learning, continual learning, constrained sequential decision making and predictive models for inventory control. Last year, I was a module project supervisor for 50 students in a master's module in which the objective was to design a minimal viable product that is a marketable solution to a realistic problem using a machine learning framework. Moreover, I am an academic coach for bachelor's students from the Honors academy at Eindhoven University of Technology. Furthermore, I have been in the assessment committee for bachelor's projects and the thesis committee for master's thesis defense.

Thus, I am experienced in teaching and supervising students at all levels of university education in a variety of topics.

Teaching Evaluations

The evaluation grade of 4.5 on a five-point scale received for the module of Reinforcement Learning exceeded the university-wide mean substantially. The following bar chart captured from the official module evaluation is a testimony to my teaching skills.
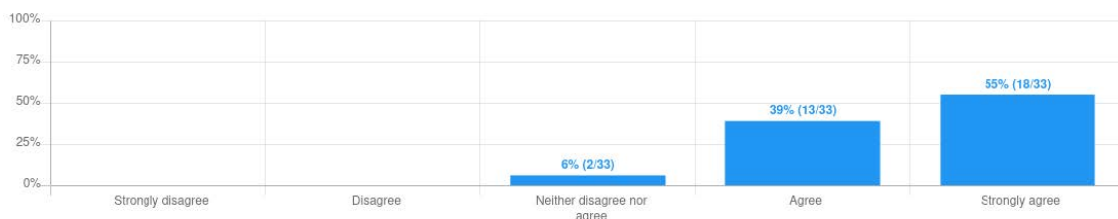

Figure 1: Official module evaluation for Reinforcement Learning : Percentage of responding students agreeing with the statement – "The lecturer explained the content in a clear and comprehensive way".

I also conducted an anonymous survey amongst students to receive feedback on issues not covered in the official evaluation. Figure 2 and Figure 3 show the salient results.
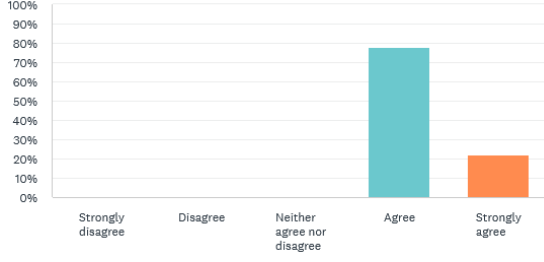
Figure 2: Percentage of responding students agreeing with – "The module materials supported the content well."
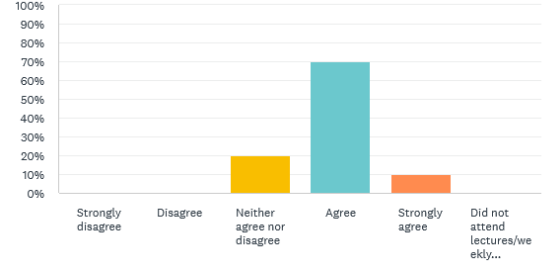

Figure 3: Percentage of responding students agreeing with – "The lecturer fostered an inclusive and accessible learning environment."

Moreover, my teaching evaluations have always improved over time. The below sample of comments provide further confirmation of students' favorable views of my teaching effectiveness :

i) "I think the teacher did an amazing job with the way all the information is organized on the slides (colors, variables, mathematical formulations, and equations), and all the real-life examples made the topic interesting. I think the teacher explained the content in a clear and comprehensive way and made it seem easier than it actually is. This course increased my interest in Reinforcement Learning."

ii) "He did a wonderful job, I looked forward to his classes. They were clear and comprehensible and helped me understand the topic."

iii) "Reinforcement Learning seems like a very difficult topic for people with a weak background in mathematics, but I felt that you taught us everything step by step and made it easier for us to understand."

iv) "It is nice that you provide us with direct feedback. This motivates us more to continue."

References

[1] Laura Celeste, Gülseli Baysu, Karen Phalet, Loes Meeussen, and Judit Kende. Can school diversity policies reduce belonging and achievement gaps between minority and majority youth? multiculturalism, colorblindness, and assimilationism assessed. *Personality and Social Psychology Bulletin*, 45(11):1603–1618, 2019.

[2] Guide for inclusive teaching. https://ctl.columbia.edu/resources-and-technology/resources/inclusive-teaching-guide/. Accessed: 2022-09-30.