Teaching Statement

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Research-informed education and outreach are important aspects of being an academic. Teaching provides a deeper understanding of fundamental concepts and helps establish well-motivated research objectives. I use my research in robotics and AI as tools to engage postgraduate, undergraduate, and school students from diverse backgrounds in computing research, encouraging them to pursue advanced degrees and careers in science and engineering. My courses seek to train students to collaborate and discuss ideas, critically evaluate research, and develop innovative solutions to open research problems.

Teaching: As a faculty member at the University of Birmingham (UK), The University of Auckland (NZ), and at Texas Tech University (USA), I have developed and taught introductory courses, electives, and research seminars in artificial intelligence, robotics, computer graphics, machine learning, human-computer interaction, embedded systems, computer networks, network security, and programming principles, for postgraduate and undergraduate students. My courses are designed to be challenging, training students to think and learn independently while collaborating with their peers. I predominantly use assignments and open-book exams instead of closed-book ("book work") in-class exams to assess students. In the introductory courses, I use assignments to ground fundamental concepts and include a final project as an opportunity to explore research ideas. My research seminars train students to formulate and address challenging research problems—I use reading and programming assignments to bring students to the state of the art, and then give them the freedom to explore their research interests. It has been my experience that if the bar is set high and students are encouraged to learn and ask questions, students measure up to the high expectations. My courses thus involve significant student participation in discussions and presentations that seek to provide a deeper understanding of the course material. Designing and teaching such courses has helped me refine my teaching skills, and I have been able to set and achieve challenging research objectives.

Mentoring: A considerable amount of my time is spent mentoring students and supervising their research projects. My philosophy for research supervision is to encourage students to set challenging goals, and give them the freedom, support, and guidance required to achieve these goals. Prior collaborations with students have resulted in novel scientific contributions and the development of innovative tools for education and outreach. These contributions have won Best Paper awards and have been presented at premier venues. Helping students achieve their research and career objectives continues to be a rewarding experience.

STEM outreach: My research and education activities are also integrated with my outreach initiatives. I have conducted workshops and summer camps for school students drawn from communities that have long-standing under-representation in science and engineering. I have also developed tools that integrate graphical programming with robotics to teach data abstraction, problem solving, and information processing, to students without any prior experience in robotics or programming. Unlike efforts that focus on designing robots from existing kits or on programming in simulated domains, my outreach efforts thus focus on preparing students for advanced degrees and careers in science and engineering. Furthermore, I have organized robot demonstrations at science fairs (e.g., at local schools), presented research to external advisory boards, and hosted field trips by organizations that mentor students from local schools.

In summary, my long-term teaching goals include the development of a broad range of courses in computer science and engineering. I am particularly committed to using robots for teaching courses at all levels. I look forward to further integrating my research with educational initiatives and outreach activities in order to enthuse, educate, and inspire students from diverse backgrounds to pursue advanced degrees and careers in science and engineering. More details regarding my teaching plans and outreach efforts can be found in my CV and on my web site: `https://www.cs.bham.ac.uk/~sridharm/`