Teaching Statement
Daniel S. Brown

Teaching Interests  I am excited to teach at both the undergraduate and graduate levels. I am comfortable teaching introductory programming, data structures, undergraduate algorithms, and undergraduate and graduate classes in machine learning, artificial intelligence, and robot learning. I am especially interested in creating specialized courses related to my research. As examples, I am excited about designing classes on topics such as value alignment of AI systems, reinforcement learning, imitation learning, human-robot interaction, and human-in-the-loop machine learning. I also plan to involve myself and my lab in developing and supporting outreach programs, such as coding and robotics bootcamps, to help underrepresented students get excited about machine learning and robotics.

As a teacher, I believe it is my duty to support, encourage, and empower students from all backgrounds. I believe in not just teaching technical skills, but also in teaching and promoting ethics, social awareness, and responsibility.

Joy of Learning.  I focus on developing a hands-on curriculum that combine topics in fun and interesting ways. My experience designing and teaching a beginning and intermediate summer Python course for middle-school and high-schools students taught me the value of actively experimenting with different styles of lectures and projects. For example, during a lesson on strings, I noticed students were getting board so I showed them how we could combine our previous lessons on if-statements and for-loops with our to build a Pig Latin translator (where the string "Pig Latin" would be turned into “Igpay Atinlay”). The students were much more engaged during the rest of the class, had fun, and were excited to show their parents what they had coded.

Assignments with Meaning.  In my classes, I emphasize building small working systems and allowing students to apply their diverse skills and interests to address real-world problems. As the TA for a course on modeling and optimization, I ran a “Tour de Finance” competition, where I mentored each student in designing a bot to compete in a month-long, real-time stock trading competition. For Honors Artificial Intelligence, I helped create an “AI for Social Good” project where we asked students to build a prototype system that used AI to solve a societal problem of their choice. As I mentored the students, I was amazed at their engagement as they explored innovative AI solutions to problems like detecting fake news, animal shelter redistribution, gentrification prediction, and textile waste reduction.

As a mentor, I encourage students to follow their interests and dig deeply into problems that excite them. I support students in their research by helping them set concrete and measurable goals, brainstorming ideas when they get stuck, and helping students develop a growth mindset that views setbacks and negative results, not as failures, but as opportunities to learn and improve. I promote a healthy work-life balance by encouraging students to exercise daily and take weekends off to recharge.

Building Confidence and Facilitating Growth.  As a mentor, I guide students and help them gain confidence as they learn to master difficult research topics and skills. In the summer of 2021, I participated in UC Berkeley’s Transfer to Excellence Program, a program aimed at helping California community college students from minority groups get involved in research. Through this program, I was the mentor for a first-generation college student who was returning to school after working for several years. I designed a summer research project with the goal of better inferring human intent by taking into account possible human irrationality. My mentee had never taken a class on artificial intelligence or machine learning so I carefully design a customized curriculum to bring him up to speed. In a matter of weeks he went from having never heard of the term “reinforcement learning” to having deep discussions with me about adaptive Markov chain Monte Carlo techniques for inverse reinforcement learning. At the end of his summer internship, this student submitted his research to the Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) Conference where he won the best poster award.

Finding Joy through Research.  I find it incredibly fulfilling to mentor students and help them discover the joy of research. I help students maintain a positive outlook and avoid discouragement by regularly reminding them of their progress and by complementing them on their growth and development. By helping students make measurable progress towards clear goals, I help students feel proud of their accomplishments. Throughout my PhD and postdoc, I have had the amazing opportunity to mentor over 20 undergraduate, masters, and PhD students across three different labs. These students have co-authored 14 publications at top CS and robotics venues. I love to see how excited these students are when their research progresses to the point where it can be submitted for publication.