Adrian Vasile Dalca

Education Statement

I aim to be a faculty member to have the opportunity of guiding students through their education and research. I am excited to create a lab environment where students can be active participants in each other’s learning, and education is prioritized as students refine their research. I also look forward to teaching a variety of core computer science courses, and designing advanced courses related to my research interests.

I am fortunate to have been part of academic environments that foster learning through a variety of mechanisms. While courses introduced fundamental concepts, I continuously learned from my peers, reading groups, clinical training programs, and materials available at my institution and online. I closely mentored several students, and have been a teaching assistant for both introductory and advanced courses.

Mentorship

Among my most rewarding experiences at MIT has been supervising undergraduate and graduate students. I found the most effective, and challenging, aspect to be helping students find and harness what motivates them. While I encouraged students to explore their own direction, they were most motivated when their projects closely aligned with tangible clinical goals. For example, a project led by an undergraduate student, who has now begun her doctoral studies at U.C. Berkeley, tackled alignment of clinical data and resulted in a best paper award. As a postdoctoral fellow, I am fortunate to be involved in a senior role in a range of projects, in which I help graduate students find creative ways to apply machine learning to medical imaging and computer vision tasks. I enjoy teaching students a combination of programming, algorithmic thinking, machine learning, and approaches to tackling research questions.

As a faculty member forming my own lab, my mentoring philosophy hinges on creating a supportive research environment that stimulates education, as the students become better researchers. I will recruit students with diverse technical backgrounds, and encourage a collaborative lab environment. Weekly one-on-one mentoring will give me an understanding of each student’s progress and challenges, and other activities, such as journal club and presentation practices, will maintain a culture of learning. As students drive their own projects, I will help them develop and refine their analytic, technical and communication skills.

During my time as a graduate student, I expanded my clinical perspective by observing surgical procedures at Massachusetts General Hospital in a program designed for engineers to learn and help improve hospital techniques and workflows. I will work passionately for an environment where students can be active members of clinical collaborations and have similar educational opportunities beyond the traditional research lab.

Courses

During my graduate career, I held two teaching assistantships in undergraduate courses at the University of Toronto – CSC207: Software Design and CSC120: Computer Science for the Sciences. At MIT, I was a teaching assistant for 6.815/865: Computational Photography, a cross-listed undergraduate and graduate course for which I was excited to teach concepts that linked my research interests with my photography hobby. Across these courses, I led recitations, labs and office hours that reinforced class materials. I designed assignments and final projects, managed discussion forums, and closely mentored a group of students through coordinating and organizing several collaborative projects. As both teacher and mentor, I found it most rewarding to identify an optimal way to guide students to the next step in their problem, while still allowing them to make the important leap, or mistake, by themselves. I received strongly positive student feedback for all courses.

I am excited and well positioned to teach a wide range of undergraduate and graduate courses, from core courses such as programming, algorithms, or machine learning, to more specialized courses, including computer vision, medical image analysis, and bioinformatics. I would also like to develop a new course at the intersection of machine learning, probabilistic modeling, and biomedical applications. Such a course would introduce advanced interdisciplinary concepts and culminate in an applied project, offering students across departments a chance to engage in state of the art research.
Community

While a few universities offer courses that cover aspects of medical image analysis, most students do not have access to such material. Within the medical imaging community, I organized specialized tutorials complementing conference workshops. To reach more students, I led the MICCAI Student Board for two years, a group that organizes student activities and enables connections to academic careers. I founded the MICCAI Educational Initiative (MEI) to facilitate online availability of educational material and promote the creation of new material through an interactive challenge.¹ This effort led to more than 20 educational videos, and a collaboration that facilitated the creation and availability of professional medical image summer school videos online. The resources created through the MEI now enable students at any institution to study medical image analysis concepts.

¹The initiative is now maintained by the MICCAI Society at http://www.miccai.org/edu/