Adrian Vasile Dalca — Education Statement

I want to be a faculty member because I want the opportunity to guide students through their education and research. I look forward to teaching a variety of core computer science courses, as well as designing advanced courses related to my research interests. I will create a lab environment where students can be active participants in each other's learning, using group meetings and activities to prioritize students' education.

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 found this combination very effective in my own education.

Classroom Teaching

I am excited and well positioned to teach a wide range of undergraduate and graduate courses, from core computer science courses such as programming, algorithms, and machine learning, to more specialized courses, including computer vision, medical image analysis, and bioinformatics. I would like to develop a new course at the intersection of machine learning, probabilistic modeling, and biomedical applications. This 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.

During my graduate career, I held 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. I received strongly positive student feedback for these courses, both in person and through official feedback surveys.

As both teacher and mentor, my focus is to help students fully understand and integrate core concepts as they learn. I found it most rewarding to identify an optimal way to guide students to the next step in their problem or learning process, while enabling them to make the important leap, or mistake, by themselves. Going forward, I believe that this strategy will lead students to build a cohesive understanding of course material while independently becoming curious about related concepts.

Mentorship

Supervising undergraduate and graduate students was among my most rewarding experiences at MIT. 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 goals such as clinical applicability. 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 have taken on a senior role in a range of projects, in which I have helped graduate students tackle research questions by finding creative ways to apply machine learning to meaningful healthcare, medical imaging and computer vision tasks. This has resulted in several first-author papers for them.

As a faculty member forming my own lab, my mentorship philosophy hinges on creating a supportive research environment that stimulates education. I will recruit students with diverse technical backgrounds, and encourage a collaborative lab environment. I am a firm believer in students first learning a solid technical foundation, on which they can develop a principled approach to research. Weekly one-on-one mentoring will give me an understanding of each student's progress and challenges. Other activities, such as journal club and presentation practices, will maintain a culture of learning and offer an opportunity to give and receive feedback, which I found to be an important part of my own development. I will also create an environment where students can be active members of clinical collaborations and have similar educational opportunities

beyond the traditional research lab. As students drive their own projects, I will help them develop and refine their analytic, technical and communication skills.

Outreach

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 online availability of professional medical image summer school videos. The resources created through the MEI now enable students at any institution to study medical image analysis concepts.

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