

Teaching Statement

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My main motivation for applying to a position in a university and not in industry is that I love teaching and interacting with students. I strongly believe in the importance of education in a society, and teaching has provided me with my most rewarding professional experiences. The knowledge we accumulate as researchers and practitioners is valuable only if it is shared.

At MIT, I designed and taught a new multidisciplinary graduate class entitled *The Art and Science of Depiction*. I explored scientific and perceptual principles behind picture production, building upon computer graphics, art history, and perceptual sciences. The audience was composed of students from architecture, media art and science, computer science, and cognitive science. The class was particularly challenging because the material covered many fields, and because the students had very different backgrounds. The feedback was very positive, and in the future, I hope to introduce these elements in an advanced graphics class. My slides are on the web, <http://gfx.lcs.mit.edu/~fredo/depiction>.

During my PhD, I had the chance to do the full teaching of a freshman introductory class for two years. The course progression and lab session were following a curriculum common to the whole university, but each of us was fully responsible for a group of 30 students. The interaction with the students was great, and the size of the class was perfect to constantly monitor the students' understanding, and to look for alternative explanations when needed. In addition, I have been TA for a variety of classes including theoretical computer science, practical programming projects, and mathematics in maple. In all cases, my research in computer graphics allowed me to attract students' attention and to anchor fundamental notions of computer science with examples drawn from their interests in games, movies, or simulation.

As a part of my teaching duties, I attended each year 10 days of seminars and group work on teaching. The emphasis was not on ready-made solutions, but on the introduction and discussion of important teaching issues. More than the subject of the seminars, the most insightful parts were the discussions with peer young lecturers and the feedback from experienced professors. This is why I wish to return the favor, and be involved in similar programs. The goal is to provide TAs or young lecturer with a forum to discuss teaching in general, their experience, their ideas, and their fears.

As a professor, I wish to teach computer graphics and the fundamental classes in computer science. A good education in computer science must rely on strong fundamentals in algorithms, data structure, numerical methods and complexity. My background in computational geometry has made me particularly aware of the need for solid foundation. Computational geometry requires strong fundamentals in algorithms and data-structures, and provides challenging problems as well as means to brush elements of research methodology. When tackling a computational geometry problem, the search is as important as the final proof. It requires the exploration of simple examples, the formulation of hypotheses, the invalidation of wrong solutions, and the generalization of intuition. I strongly believe that our experience in research is fundamental to assist students in learning to explore a problem when they have no intuition of its solution.

I hope to teach computer graphics, and rendering in particular. Besides the practical importance of the field, it is a great opportunity to teach and review fundamental techniques in mathematics and computer science. Rendering, for example, involves linear algebra, finite elements, integration and probability, geometry, wavelets and hierarchical approaches. The breadth of my research in computer graphics will help me develop and teach a comprehensive and well-illustrated course.