

# Marten van Dijk

Statement of Teaching

MIT Computer Science and Artificial Intelligence Laboratory  
the Stata Center, 77 Massachusetts Ave, 32-G864 Cambridge, MA 02139, USA  
marten@mit.edu

When I worked in industry, I enjoyed explaining concepts and new ideas to my colleagues and peers. Wishing to extend this experience into teaching students, I immediately took the opportunity to get involved with teaching Computer Science courses as soon as I joined the MIT Computer Science and Artificial Intelligence Laboratory in 2005 as a Research Scientist. I volunteered (without financial compensation) as a teaching assistant for “Introduction to Algorithms (6.046)” where I taught recitations and helped students on an individual basis. In this way I came to understand the MIT way of teaching. Based on my performance, the MIT Electrical Engineering and Computer Science Department (EECS) then offered me further teaching opportunities and I gained significant experience in teaching undergraduate Computer Science courses during the last three academic years:

- In Spring 2009, I co-lectured “Design and Analysis of Algorithms (6.046)” together with Prof. Manolis Kellis for 60+ students. This course heads the MIT EECS engineering concentration of Theory of Computation and is mainly based on the textbook *Introduction to Algorithms* by Cormen, Leiserson, Rivest, and Stein. Since the course was recently redesigned in fall 2008, I had the experience to rework and improve existing lecture notes and introduce some new material.
- In Fall 2008, I co-lectured “Mathematics for Computer Science (6.042)” together with Prof. Tom Leighton for a class of 170 students. The course covers applications of Discrete Mathematics to Computer Science ranging from induction, solving recurrences, approximating sums, and counting, to an introduction in probability, number theory, and graph theory.
- During Spring 2008, along with other MIT professors and research scientists, I was one of the recitation instructors for “Computer System Engineering (6.033)” on the engineering of computer software and hardware systems. During interactive recitation sections of 20 students each, I taught a broad range of techniques using practical real world examples by discussing papers on topics such as Therac-25, Unix File System, MapReduce, Ethernet, NATs, LFS, and others.

I have experience in course management, design of problem sets, facilitating small groups of students in intensive interactions, and also teaching large class sizes in lecture halls. Over the years, I have improved my skills in using the blackboard to visually demonstrate a concept in an effective and clear way. I further clarify concepts by using examples from different perspectives. After six years of experience I have discovered the capacity to observe myself while teaching: this helps me to adapt to the needs of the class and respond accordingly. I take student evaluations seriously and I am always willing to improve myself and learn from my experiences. For example, I have striven over the past few years to model rigorous thinking by explaining *details*, but without confusing students as to the *general* concept.

Besides teaching for groups of students, I enjoy guiding students individually. For example, a student already had a job lined up but he was still struggling to pass his “Introduction to Algorithms” course. I met with him several times outside office hours to prepare him for the final by

teaching him the nuts and bolts of the most important methods taught in the course. He passed and was especially grateful like several other students after similar experiences in my office, which has even led some students to invite me to dinners at their fraternities to honor me as their "most dedicated teacher."

My philosophy of teaching, in the first instance, is to instill curiosity and cultivate interest in students about the subject matter and the learning process. I achieve this by being a role model who is enthusiastic, positive and curious; by conveying the beauty of science and research and their historical development and practical relevance; and by showing that learning has an intrinsic value. I teach students how to understand and apply theories to a range of problems, and to think independently, critically, and creatively. I guide students towards acquiring a sound knowledge base, authentic understanding, and rigorous analytical skills. My extensive publications and experiences as a Research Scientist have contributed to my breadth of knowledge at hand in the classroom. Additionally, throughout my vigorous experiences in the classroom, I have discovered both my passion and potential as a teacher in my field of research.