

Teaching Statement

Kiran Garimella

I see teaching as a means of producing arguably the most impactful outcomes an academic can achieve. It provides an incredible opportunity to disseminate knowledge and mould the thinking of the next generation. I sincerely believe that teaching is as important as research; while research pushes the boundaries of the possibilities in the present, teaching is our investment in the future. As a teacher it is my duty to make sure students are interested in the material being taught by making sure that the concepts are made as simple as possible. This could be done, for instance, by connecting concepts to real world applications where ever possible and helping students understand how these concepts bring value to them. I try to make my lectures fun and engaging, as witnessed by best presentation awards at conferences (SocInfo 2014) and my successful participation in popular science communication workshops.¹

I feel that we are living in an increasingly digital era and in the coming years, we will witness an explosion in possibilities for interdisciplinary research. This could be due to various factors like the growing availability of digital data and/or the increasing role of algorithms around us. The impact of such interdisciplinary research goes beyond just academic publishing. It impacts the way we think and the way we lead our daily lives. Ethics, for instance, which is traditionally considered a subject from philosophy, has now strong relevance in how we design our AI systems and algorithms. In such a world, an interdisciplinary thinking is inevitable in order to master our new digital reality. This interdisciplinary way of thinking is not just a requirement for Computer Science (CS) students but also for students of other disciplines, who will need to be educated in the basics of CS and programming. There is also a case to be made on the other side: computational experts will more and more be dealing with social phenomenon and will need to embrace traditional sociological thought. In such an environment, the current classrooms will also become more interdisciplinary and cross subject boundaries. I feel comfortable being in such an environment as evidenced by my regular speaking engagements to a wide range of audiences, including academics from multiple disciplines, journalists and policy makers. As a teacher, I will need to be at the forefront of such change and one of my focus will be to develop my skills and those of students to encourage and embrace this interdisciplinary thinking.

As part of my lectures/courses I will put strong emphasis on the development of individual thought, ability to work in groups, and developing strong communication skills. This can be done using a combination of individual assignments, group discussions and in-class presentations. Expressing one's thoughts clearly in a consise manner is a necessary skill in any discipline. To that end, I will encourage in-class presentations, submitting reports on semester-long projects and engaging in group assignments with team members as key components of my courses.

Finally, I think online learning will become a part of teaching going forward, at least in the short term. Given the flexibility teaching most CS related courses entails, I feel that I can use technology to enhance course materials and further support my pedagogy through blended learning

¹I was the winner of the ICWSM Science Slam 2017. <https://sites.google.com/site/icwsmscienceslam/>

that combines classrooms with online teaching, flipped classrooms that provide materials that students can access after class, and overall provide wider access to sources and experts online. I strongly feel that the shift in focus to online teaching must be carefully designed to keep inequities in access to technology in mind.

Teaching experience

Teaching Assistant My first experience with teaching was as a course assistant for a few courses on software engineering and data mining during my Masters. My duties included grading exams, offering tutorials, lab sessions, and office hours and required frequent coordination with the instructors and students.

Course Instructor I taught a 2 week intensive course titled Fundamentals of Digital and Computational Demography for a group of inter disciplinary graduate students at the Max Planck Institute for Demographic Research. The course deals with teaching the sociology students basics of machine learning and data analysis. During my Masters, I co-taught a course on Python programming to a group of Masters students not from a computer science (CS) background. I was the course coordinator for the Research projects in Data Science and Machine Learning course at Aalto university for three years (2015–2017). I was responsible for collecting and assigning data science semester projects to students. During the summer of 2018, I taught introduction to Javascript, as a 2 week crash course to refugees as part of the Powercoders initiative.² The course was a module in a broader web development for beginners program and I had to design the lectures to be able to cater to novice students, who were beginning to learn programming. I have also taught around half a dozen tutorials (one full day lectures) on subjects related to polarization on social media, building tools for getting data from WhatsApp, and about advances in computational demography.

Being a teaching assistant and course instructor were a formative experience, because they led me to (i) realize that with thorough preparation I could teach subjects that were at the boundaries of my area of expertise, (ii) see first-hand the difference that meticulous course design can make for large undergraduate courses and students beginning their career in non CS disciplines, (iii) How including real world examples in the concepts I present, though challenging and tedious to design, can help students in understanding difficult technical concepts, and, (iv) how teaching is a two-way street, where I learn a lot more in teaching about a subject, which makes it even more exciting.

Another important aspect especially important in my field involving large scale data is ethics. I always try to be mindful about making the right ethical choices in analyzing data, and in developing algorithms, and try to imbibe similar ethical principles in my mentees.

Experience as Student Advisor

Throughout my career, I had the opportunity to mentor a number of postdocs, graduate and undergraduate students in research projects. For example, for most of my PhD, I was the course coordinator for a seminar on data science projects. The course acts as a first look into research for most of these students. Along with other colleagues, I planned the projects in the course and we've been able to mentor 7 students, and most of their projects led to publications at top-tier

²<https://powercoders.org/>

conferences in the Computational Social Science/Data Mining community. Three out of the seven students I worked with ended up entering a PhD program, which I partially consider a success in my mentorship, since the course kindled their interest in research. This experience taught me how to help navigate upcoming students to select important research problems and make meaningful contributions to them.

As a PhD student and a postdoc, I had the opportunity to mentor a number of graduate and undergraduate students in research projects. For most of my PhD, I was the course coordinator for a seminar on data science projects. As part of that, I've been able to mentor 6 students, most of the works leading to publications at top-tier conferences in the computational social science/data mining (conferences like WSDM, WWW, ICWSM, etc). I also supervised many Bachelors and Masters theses, and summer interns at both Aalto, EPFL, and MIT. In my experience, different people work differently, and therefore I'm careful to be flexible with my approach when advising on individual student projects. For example, I found that some people need more guidance in their first steps than others. For semester projects, I give the students the freedom to decide how actively they would like to get involved and set thresholds based on their interest. I often focus on a three step approach to tackle a project – (i) set a goal, (ii) lay out the steps towards the goal and (iii) encourage the student to create a plan to work towards the goal, by defining her own pace. Though the goal and the steps often change during the course of the project, this enables the student to focus on one thing at a time and track their progress. I also try to make sure that the students understand that research is a continuous cycle of observing, experimenting, and evaluating.

Teaching Interests

I am interested in teaching courses related to the following areas.

- *Data Analytics/Machine learning.* This area covers technical topics close to my area of expertise as researcher. These topics include web and social media mining, urban computing, text mining, social network analysis, information retrieval, among others. I'll also be happy to teach courses within the wider area of my expertise, including courses on basics of statistical learning (e.g. an introduction to data science), database management, machine learning, etc or specifically focus on business analytics.
- *Data Science for Social Good.* I am interested in teaching an interdisciplinary course, that cross boundaries of computer science, which introduces students to problems in other disciplines and provide solutions for social good using techniques from information/computer science. Computational social science (computation + social science), for instance, would touch upon how computer science interacts with social science. Other interesting areas that could be covered in the course are: (i) computational journalism (e.g. with the school of Journalism) covering subjects such as misinformation looked from both a technical as well as a editorial and journalistic perspective, (ii) computational politics (computation + political science) covering issues related to polarization, propaganda, influence, etc; and (iii) computational demography (using digital sources to understand and study human migration and other demographic traits), etc.
- *Basic Programming.* At the introductory CS undergraduate level, I feel that with some preparation, I would be able to teach almost any course. Since I am particularly passionate with building scalable web based systems, I would be very excited to teach introductory courses on

web programming and algorithms.