

YONGSUNG KIM | TEACHING STATEMENT

When it comes to teaching and mentorship, I focus on creating learning environments that provide undergraduate and graduate students with opportunities to learn to self-direct complex work. The following three main learning goals summarize my approach to teaching and mentorship.

First, I create learning environments for students to build *self-regulation skills*, i.e. cognitive, meta-cognitive, and strategic behaviors for reaching desired goals and outcomes [1]. I've supported students to build regulation skills when mentoring students through Design, Technology, and Research (DTR) program at Northwestern. Building these skills allows students to plan, execute, overcome challenges, and reflect on progress—all of which are important for leading complex projects.

Second, I emphasize developing new skill sets that are out of one's comfort zone. I encourage students to learn new skills and practice those skills through their own projects. For example, in DTR I encouraged students who came in with strong technical skills but no design experience to focus on learning user-centered design methods and practice those by emphasizing needfinding and user testing earlier in their research. I also encouraged students who came in with strong design skills to pick up new programming languages and frameworks, and to not shy away from building higher-fidelity prototypes when the project demands it. By doing this, I help students develop growth practices and mindsets that support their picking up new skills and overcoming challenges, especially in the parts of their work where they have less experience or expertise.

Finally, I actively promote help-seeking and help-giving in the learning communities that I serve. In my mentoring and teaching work, I noticed that many students are reluctant to seek help because they are not used to asking for help or afraid that asking for help means that they are not intelligent. I strive to change such mindsets in our students, and to help them realize how they can learn to conduct research and lead complex projects in a more collaborative learning environment with an entire community's support. I do this by coaching students to better articulate problems, identify multiple helpers for addressing various needs, and connecting to those helpers online and in-person. Through coordinated help opportunities such as Pair Research [2], I also encourage students to see the value of offering and receiving help when students help one another overcome obstacles in their respective projects.

Teaching and Mentoring through Design, Technology, and Research

Much of my teaching and mentoring experience come from teaching and mentoring students through Design, Technology, and Research (DTR) [3], a research program at Northwestern University. DTR is a repeated 10 week-long studio session that offers undergraduate and graduate students opportunities to lead research projects in HCI, AI, Social and Crowd computing, and Cyberlearning by iterating over designs and prototypes, building systems, conducting studies, and reporting findings through conference publications and work-in-progress papers. DTR consists of Special Interest Group meetings (SIG meetings) and Studio meetings. Special Interest Groups (SIG) brings together undergraduates, PhDs, and faculty who work on different projects in the same research area to plan work and devise strategies to overcome challenges. Studio meetings bring together all researchers in a studio to promote progress making, learning, and collaboration across SIGs.

Since Fall 2015, I have been fortunate to mentor 14 (6F, 8M) students on 7 projects through the On-The-Go Crowdsourcing Special Interest Group (SIG) that I lead. I had co-led the SIG with my advisor for the first two years of my PhD as I learned to mentor students and lead a research group, but since Fall 2017 I have been leading the research group myself. As SIG head, I mentor students and their projects by: (1) Coaching students to develop more effective

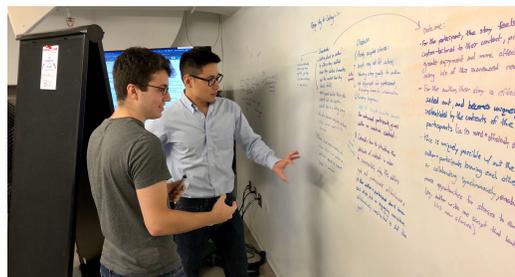


Figure 1: A photo of me coaching a student on their research arguments during a studio meeting.

planning and help-seeking strategies through weekly SIG meeting; (2) Conducting mid-quarter and end of quarter meetings to discuss and facilitate students reflecting on their project progress and skill growth, as well as their personal growth via their own meta-cognitive goals and blockers; this helps students with making effective progress but also to develop the research and metacognitive skills needed to become skilled independent researchers; (3) Helping students develop their writing skills through working with them on undergraduate research grant proposals and research papers that they submit to HCI conferences.

As a part of my SIG, 4 of my students published 3 full papers at premier venues in human-computer interaction and social & crowd computing (UIST2016, HCOMP2016, CSCW2019), and 5 students received undergraduate research grant from Northwestern University. One of my mentees, Kapil Garg, developed a technique called 4X for low-effort participatory sensing that uses existing, collected data to inspire further contributions to build data fidelity and coverage. His work is published at CSCW 2019 where he will present the work as lead author. Another one of my mentees, Shana Azria, worked on a community-based on-the-go package delivery application that uses community members' existing routines and routes to deliver packages. I guided her through the design and development of the application and the data analysis of a user study. This work was published at HCOMP 2016. Both Kapil and Shana joined DTR with strong technical backgrounds, but I encouraged them to develop design skills and ways to think from the user's perspective when designing systems. Instead of telling them what they should do next, I created an environment where they could learn to direct their own research project by (1) planning on a weekly basis with clear goals and outcomes; (2) identifying risks and developing strategies for overcoming blockers; and (3) seeking help from the DTR.

My own training in DTR have prepared me well for a faculty position as I have been effectively leading a small research lab through my own SIG while also learning to mentor students across multiple areas of research through weekly coaching sessions. Over the last year I have been apprenticing with my advisor Haoqi Zhang as he coaches students during studio meetings, walking around to give feedback to students as they work on relevant aspects of their research project on the board (e.g., developing design arguments; refining study designs). Similar to a resident in a medical school or hospital, I wrote down observations of mentoring interactions and strategies, de-briefed on what I learned each week, practiced coaching students on my own, and incorporated feedback on what I did well and where I could improve while also reflecting on how I mentored each student's project. Over the last two quarters I have began to mentor students directly over a two-hour period during studio meetings during which I work with students to (1) identify what learning modules they will focus on; (2) help them develop more effective ways of working on their projects through coaching them to use more effective problem representations and models; and (3) help students to learn to identify risks and issues on their own so they can better direct their projects on

their own when I am not around; see Figure 1.

Putting my training to good use, **I will be serving as the instructor of the Design, Technology, and Research program at Northwestern University (COMP_SCI 315, 497)** for Winter and Spring quarters of 2020. My responsibilities as an instructor will include: mentoring all student projects through bi-weekly coaching sessions and developing new learning modules; facilitating in-class activities and developing collaborative learning opportunities; and coordinating committees for interviewing, on-boarding, quarterly reflections, social events and so on, that help our community to function and strive while we connect with one another. I expect this opportunity will further my development as a mentor, and I look forward to bringing all that I have gained and provided for DTR to my future teaching endeavors and mentoring roles.

Advancing Pedagogical Goals in a Single Quarter Project-based Course

I also served as a teaching assistant for social and crowd computing class (EECS 395/495), which is a seminar course taught in Fall 2015. The class was taught as a flipped classroom, where reading assignments were done as homework and class time was dedicated to discussions, short presentations, and hackathons. I implemented three things in this class to advance my pedagogical goals. First, I set milestones and used frequent studio critiques and check-ins to bring awareness to blockers in students' learning and progress, and promote learning more effective strategies to resolve issues. Second, I encouraged collaboration through short presentations and hackathons. This allowed students to collaborate with many classmates throughout the quarter. Finally, I co-designed and used self-assessment form that focused on processes rather than outcomes. This offered opportunities for students to reflect and learn from their past experience.

Future Courses

Introduction to Human-Computer Interaction: An introduction to human-computer interaction and the design of systems that involves needfinding, ideation, iterative prototyping, user evaluation, presenting demos and findings. Students will learn design methodologies and principles necessary for the design process. Programming assignments and final projects will help students to enhance software implementation skills of building fully working systems in web or mobile environments.

Introductory Programming for Data Science: An introduction to programming languages, tools, and statistical models needed to conduct data analysis. Students will learn the basics of (1) data acquisition, cleaning, and aggregation, (2) data analysis with statistics and machine learning, (3) data communication with information visualization.

Design, Technology, and Research: A multiple quarter project course for developing novel technologies and creative solutions through, design, engineering, and research. Students will work with a mentor to identify a direction of research, explore and iterate over designs, prototype at varying fidelities, build working systems, conduct evaluative studies, and report findings through conference publications.

Social and Crowd Computing Seminar: An introductory seminar class for social computing and crowdsourcing systems. Topics include core building blocks for designing computer-mediated social computing systems/online communities; motivations, workflows and algorithms in paid or volunteer-based crowdsourcing systems. Students will study existing ones and prototype new systems.

Human-AI Interaction Seminar: An introduction to important topics in Human-AI interaction. Topics include mixed-initiative systems; human-in-the-loop systems; communication between human and AI; and interpretability and transparency of algorithms or intelligent systems.

References

- [1] Sanna Järvelä and Allyson F Hadwin. 2013. New frontiers: Regulating learning in CSCL. *Educational Psychologist* 48, 1 (2013), 25–39.
- [2] Robert C Miller, Haoqi Zhang, Eric Gilbert, and Elizabeth Gerber. 2014. Pair research: matching people for collaboration, learning, and productivity. In *Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing*. ACM, 1043–1048.
- [3] Haoqi Zhang, Matthew W Easterday, Elizabeth M Gerber, Daniel Rees Lewis, and Leesha Maliakal. 2017. Agile research studios: Orchestrating communities of practice to advance research training. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing*. ACM, 220–232.