NAM WOOK KIM · TEACHING STATEMENT

Deeply rooted in challenges and successes in my teaching and mentoring experiences, I developed a strong enthusiasm for education which is one of my primary motivations for pursuing a faculty position. I have found that having direct influences on student's learning and seeing them realize their potential is as much rewarding as having impacts through research. I am grateful for mentors who demonstrated effective teaching skills and provided opportunities to practice teaching in various contexts. I would like to pay this support back and contribute to education for the rest of my life.

TEACHING EXPERIENCE

My goal in teaching is to build an inclusive and active learning environment for all students and to empower them with both theory and practice to tackle challenging real-world problems.

ENACTMENT. My formative experience as a teaching fellow for Prof. Hanspeter Pfister's Visualization course demonstrated the importance of **active learning**. I led a weekly design studio of a handful of students in which they engage in hands-on activities including design critiques and redesigns of existing visualizations in the wild. My aim was to guide them to articulate design rationale using the vocabulary learned from the lectures to foster deeper learning of course materials.

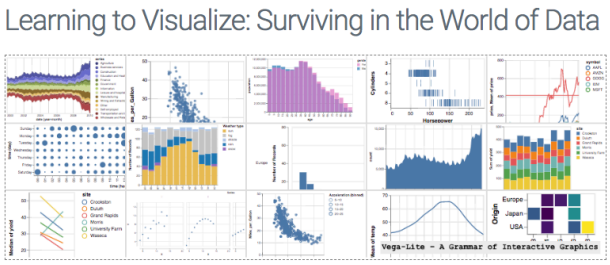

Figure 1: A visualization mini-course I taught as part of January@GSAS at Harvard - https://www.namwkim.org/datavis.

I strive to combine both **theory and practice** rather than merely offering technical skills. I had an opportunity to teach a mini-course about visualization (Figure 1). First, I taught foundational knowledge about the value of visualization, borrowing theories from cognitive psychology. Next, I developed a real example scenario in which students used Tableau, a widely used visualization software, to analyze H-1B visa petition data available on Kaggle and communicate the findings.

I aim to establish the student's **independence** and **self-confidence** in learning. For instance, when I assist students with programming exercise, I follow the 'never touch the keys' policy. I learned this through the Bureau of Study Counsel when I served as a tutor for CS 50. I developed a strategy to provide just enough guidance along with strong patience to wait for students to explore the problem space on their own. I still cannot forget the moment when a student gave me a warm hug after spending three-straight hours with me to complete the assignment. I think it is crucial for students to earn the feeling of accomplishment to improve self-efficacy.

ASSESSMENT. I deepened my assessment skills when I served as a teaching fellow for the Design of Useful and Usable Interactive Systems course taught by Prof. Krzysztof Gajos. In this course, the assignments are scaffolded to tackle a real-world design challenge. There is no right or wrong answer which makes it difficult to grade the assignments. Instead of merely giving grades, I put more emphasis on providing **constructive feedback** with which they can use to improve their work in the next phase. To help students go beyond their limits, I intentionally nudge them by asking for a more **rigorous rationale** for their design decisions and providing counterexamples.

One of the challenges I had was objectively assessing the performance of students on inherently subjective design problems. Even with a detailed grading rubric, it is impossible to avoid infusing my subjective judgments. This often inadvertently gave a biased impression to students about fairness in grading. I expect that this is likely to be a significant issue for my future courses as well. Thus, I plan to investigate systematic ways to moderate the grading bias in the future (e.g., peer reviews and rebuttals).

INCLUSIVITY. My fields of teaching and learning, i.e., visualization and human-computer interaction, draw students from a variety of backgrounds from business, arts, and humanities to science and engineering. In addition, designing visualizations and user interfaces to tackle real-world problems necessitates understanding others who may have different backgrounds (race, gender, personalities), cultures (ethnicity), and abilities (motor- or vision-impaired, technical knowledge, language barriers). As a result, it is critical to provide a safe and comfortable environment and accommodate individual differences.

For instance, when organizing student groups in the class, we applied various measures such as ensuring no single female (first year) student in a group or pairing students with different levels of skills in labs. I also went the extra mile when one team in my studio struggled in building positive team dynamics due to the absence of a technical team member. I took a risk to play a role as a member while trying not to disrupt their learning experience. It could not be more rewarding to see them succeed with minimal guidance from me, and when they approached me at the end of the semester to thank me for my being there.

MENTORING EXPERIENCE

In contrasts to the classroom teaching, it requires a different approach to mentor students in research settings. It is vital to equip them with the ability to generate knowledge rather than consuming the existing one. I believe anyone with intellectual curiosity has enough potential to be a researcher and just needs to go through appropriate steps to acquire the necessary skills. My approach to research mentoring has been a combination of **hands-on demonstration** and **ceaseless question & answering**.

I advised a female graduate student and two high school students, one female and one male (MIT-RSI). I have learned that demonstration was extremely useful to motivate them to begin working on their own. I often sat down with them side by side to demonstrate various research activities from conducting literature research to pair programming and collaborative open coding. I endeavored to provide opportunities to take part in and make meaningful contributions to real-world research projects.

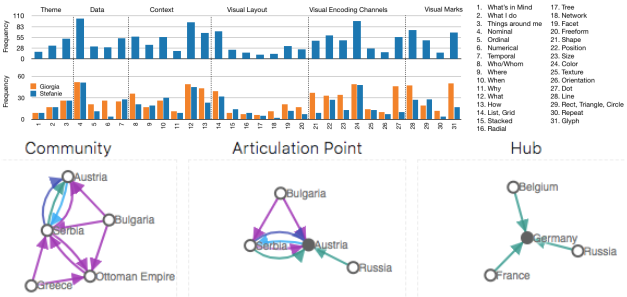

Figure 2: Two high-school students worked on analyzing visual encodings of personal data (up) and extracting structural patterns from dynamic networks (down).

TEACHING PLANS

I would like to design my courses to be **project-oriented** following the constructionism approach[1], lowering barriers for incorporating students with diverse interests and backgrounds, ensuring wide walls for accommodating individual differences, and offering high ceilings for motivated students.

I am interested in teaching upper-division courses on 1) **visualization**: students will be able to design effective visualizations to explore data, make informed decisions, and communicate insights found from the data, and 2) **human-computer interaction**: students will be able to identify an important problem in the wild and design a useful and usable product that addresses the problem.

I am excited to design new courses such as 1) **interactive data science**: students learn the life cycle of the data analysis process from data collection to cleaning, exploratory analysis, modeling, and presentation, and 2) **data-driven applications** in which students take real-world datasets and build usable and useful data products (e.g., web-based applications, data-driven articles, etc.).

I would also be interested in teaching graduate-level courses on these topics. The courses would focus more on learning how to conduct publishable research, realizing different types of research contributions (e.g., systems, methodologies, techniques, etc.) and going through the peer-review process of the papers.

[1] https://design.blog/2016/08/25/mitchel-resnick-designing-for-wide-walls/