

Teaching & Advising

Abe Davis

Assistant Professor of Computer Science, Cornell University

Note: [blue text](#) links to related web content.

Teaching

I have taught three courses while at Cornell:

- [Intro to Computer Graphics & Graphics Practicum](#) (Ithaca, FA2020-24)
- [Computation for Content Creation](#) (Ithaca & CT Remote, SP2021-24)
- [Introduction to Computer Vision](#) (Cornell Tech, SP2020)

I would be happy to teach similar courses, but am also open to teaching other subjects, including:

- **Computational Photography:** I could readily teach this at the undergraduate, masters, or PhD student level.
- **Research Methodologies in Sciences & Design:** I am very interested in developing a course on research methodologies used across different disciplines, and how they can be combined in interdisciplinary work.

This statement summarizes my teaching as faculty at Cornell, with a focus on ways that I have innovated on course and project design.

Redesigning Coursework Around Transferrable Open-Ended Projects

My largest teaching commitment at Cornell has been the introduction to graphics course for undergraduates and graduate students. The subject of computer graphics stands out within computer science for its many connections to creative applications. The field itself has grown broad, and different students bring interest in different topics to the classroom. Over the last several years, I have completely redesigned the graphics course with two major goals in mind: first, to modernize the material and assignments, and second, to make open-ended creative projects a focus of the class. With these goals in mind, I designed a more project-oriented version of the course that is a better fit for the subject and stresses more transferable skills for students. In the current version of CS4620, I offer two large open-ended creative assignments during the semester and a one large final project. A major goal of these projects is to reward students' efforts with deliverables that they can present on personal websites and CVs to showcase their work. With this in mind, most of the assignments and projects are now done in a custom graphics API I built for the course that compiles to the browser, which I call *AniGraph*. Over the semester, each subsequent assignment with AniGraph exposes more control over the graphics pipeline, and by the final project, students are allowed full integration with ThreeJS, the most popular API for web-based graphics. Students can also compile their creative projects into web demos that can be served from personal websites, and are asked to submit video demos for each project that also serve to showcase their work. I have been asked to write many reference letters for students from the class over the years, and in most cases I find their course projects linked prominently from websites or CVs. You can find final project showcases online from [Fall 2025](#), [Fall 2024](#), and [Fall 2023](#). Past examples of the semester's first creative project can be found on [this year's assignment docs](#), and projects from an earlier iteration of AniGraph (2020) can be found [here](#).

Managing Hundreds of Open-Ended Projects in a Semester

Even with students working in pairs on most assignments, scaling 3 creative projects to a class that has had between 150 and 300 students in past years means supporting, managing, and grading hundreds of open-ended projects each semester, which is an ambitious undertaking, to say the least. Making this harder, the course also tends to be under-staffed, in part because students

tend to take it in their final year. Over the years, and more recently in research with one of my PhD advisees, I have developed an interactive system to help make this kind of open-ended project grading more efficient, scalable, and fair. This system has become indispensable for running the course, and was the inspiration for a paper *Interactive Explainable Ranking* recently accepted CHI 2026. The creative projects have also become a highlight of the class for students. Detailed guidelines and documentation for each project can be found [on the course assignment docs](#), which are open to the public. We plan to release our grading tool upon publication. I originally planned to open source AniGraph, but have more recently been considering ways that a codebase like AniGraph may be used to facilitate open-ended projects that make AI coding assistants more difficult to use.

Other Content

I have also been developing new content for the course outside of lectures and assignments, including web demos for visualizing various concepts from the course, for examples: [2D linear transformations](#), [2D affine transformations](#), and [point-line duality in the plane](#). I am also putting together videos based on some of my lectures to release. Examples include [this video on point-line duality](#) and [this one on the standard real-time graphics pipeline](#).

Computation for Content Creation (CS6682)

My course on computation for content creation also has a unique structure, as it mixes technical material with art and design. In addition to a large final project, the course has a mix of programming and artistic assignments in the first half of the semester. Every student receives a semester license for Adobe Creative Cloud, and several course topics cover designs and techniques that make tools from the creative cloud software suite work. Students are tasked with implementing some of these techniques in programming assignments, and with using creative cloud applications to create content in art and design assignments. This has worked well, and one final project from the first iteration of the course has even turned into [an ACM UIST paper](#).

Advising

Running a [research group](#) is my favorite part of being faculty. I moved to Ithaca right at the beginning of COVID shutdown, which made it difficult to recruit PhD students during my first two years. During that time, I worked mostly with a handful of talented undergraduates, most of whom are now at top graduate programs (MIT, Stanford, Princeton, and Cornell). Since quarantine ended, my group has grown to include seven PhD advisees who come from diverse research backgrounds spanning visual computing, HCI/HRI, design, and neuroscience. I foster a creative and collaborative environment in the group and try to encourage students with different expertise to work together. I also place a lot of importance on the long-term development of research skills. I am careful to make sure that each of my PhD advisees takes ownership of a unique research direction, which has contributed to the diverse set of topics we tackle, while also encouraging students to take on secondary supportive roles in each other's work to build breadth, develop new skills, and create a more collaborative environment. I also encourage my PhD students to act as co-advisers for undergraduates to build mentorship skills.

I am lucky to run a group with a vibrant, diverse, supportive, and [fun](#) culture, and I try to promote that culture as much as possible by being very active in the lab and promoting community-building opportunities for the students. My group's weekly group meetings are attended by a mix of my own advisees (undergrad and grad) and several "friends of the group" from different research groups. I care a lot about fostering an environment that makes everyone feel welcome and excited to come to the lab.