Many well-engineered systems will launch and then languish because they do not solve pressing human problems. My goal is to teach students in human-computer interaction (HCI) both the core concepts for creating modern interactive experiences and also the reflective practice necessary to apply those concepts to significant human needs. To do so, I engage students through project-based learning and hands-on critique.

CS 247: HCI DESIGN STUDIO. I led a significant redesign of CS 247, our advanced design studio class for computer scientists. One problem that the class faces is that enrollment has recently quadrupled. HCI's educational model directly contravenes this scaling pressure: HCI is taught as a studio discipline, requiring feedback and critique from experienced instructors rather than auto-gradeable programming assignments. How can we scale an educational experience that is fundamentally rate-limited by the number of students who can be directly mentored in a studio environment? While our introductory HCI course (CS 147) succeeds at teaching user-centered design by using TAs as studio instructors, the upper-division design courses do not readily scale through TAs. Unfortunately, experience has demonstrated that TAs have neither the experience nor the gravitas to be effective studio leaders at an advanced level.

So, I recruited six professional designers and researchers (e.g., the user experience manager for Android, a lecturer at the Stanford d.school, a design consultant, and a UI design lead at Google) to become studio instructors. Each studio instructor chose a theme such as Health, Data Narratives, or Leveling the Playing Field, and students self-selected into a topic of interest. I complemented studios with a new set of lectures, assignments, and activities, as well as studio scaffolds with scripted studio activities. With these changes, a 120-person class could could divide into 20-person studios for direct critique. Later, we further integrated lecture and studio so that we could engage students in more depth as the quarter evolved.

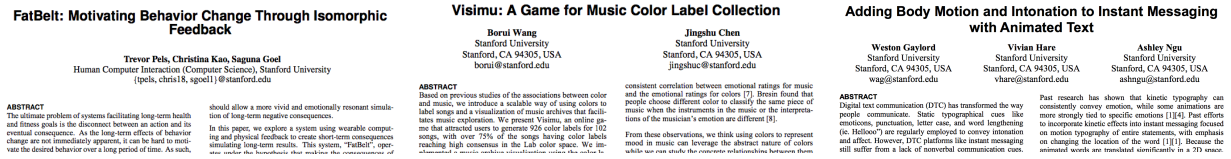
A second problem: Stanford HCI students were graduating as excellent "post-it note" designers who could execute the design thinking process, but were unprepared to execute those designs in code to create compelling prototypes. So, I added an advanced visual design and implementation unit to the class, focusing on the use of grids, negative space, font and color, as well as implementation strategies for those issues in front-end web frameworks. In one assignment, students utilize visual design skills to create a professional portfolio on the web.

Class projects in CS 247 (HCI Design studio) included an urban exploration game, a job search tool for homeless in collaboration with a local agency, and a communication platform that connects artists to their most active fans.

Student project portfolios created in CS 247 followed a course unit on visual design and implementation. (Names cropped out for posting online.)

CS 376: HCI RESEARCH. Our core HCI sequence teaches students the fundamentals of user-centered design and design thinking, but human-computer interaction research features a complementary set of skills focused on the engineering of novel user experiences and the pursuit of social scientific questions. I re-balanced our graduate-level research seminar (CS 376) to complement its prior focus on discussion with a new lecture component. This lecture sequence introduced broad overviews of research areas ranging from ubiquitous computing to social computing and design tools. The class has grown in interest amongst undergraduates and masters students to the point where we now must split into two parallel rooms to host our discussions.

As with other HCI classes, CS 376 features a heavy project component. The staff and I mentor student teams throughout the quarter to help them conceive and execute novel research projects in an area of interest. Undergraduates, masters students and PhD students students regularly submit their class projects to top-tier technical conference venues in HCI as work-in-progress papers. A number of Stanford students have now presented their work in front of colleagues of worldwide reputation.



FatBelt: Motivating Behavior Change Through Isomorphic Feedback

Trevor Pels, Christina Kao, Saguna Goel
Human Computer Interaction (Computer Science), Stanford University
{tpels, chris18, sgoel1}@stanford.edu

ABSTRACT
The ultimate problem of systems facilitating long-term health and fitness goals is the disconnect between an action and its eventual consequence. As the long-term effects of behavior change are not immediately apparent, it can be hard to motivate the desired behavior over a long period of time. As such, should allow a more vivid and emotionally resonant simulation of long-term negative consequences.

In this paper, we explore a system using wearable computing and physical feedback to create short-term consequences simulating long-term results. This system, "FatBelt", oper-

Visimu: A Game for Music Color Label Collection

Borui Wang
Stanford University
Stanford, CA 94305, USA
borui@stanford.edu

Jingshu Chen
Stanford University
Stanford, CA 94305, USA
jingshuc@stanford.edu

ABSTRACT
Based on previous studies of the associations between color and music, we introduce a scalable way of using colors to label songs and a visualization of music archives that facilitates music exploration. We present Visimu, an online game that attracted users to generate 926 color labels for 102 songs, with over 75% of the songs having color labels reaching high consensus in the Lab color space. We im-

consistent correlation between emotional ratings for music and the emotional ratings for colors [7]. Brosin found that people choose different color to classify the same piece of music when the instruments in the music or the interpretations of the musician's emotion are different [8].

From these observations, we think using colors to represent mood in music can leverage the abstract nature of colors

Adding Body Motion and Intonation to Instant Messaging with Animated Text

Weston Gaylord
Stanford University
Stanford, CA 94305, USA
wag@stanford.edu

Vivian Hare
Stanford University
Stanford, CA 94305, USA
vhare@stanford.edu

Ashley Ngu
Stanford University
Stanford, CA 94305, USA
ashngu@stanford.edu

ABSTRACT
Digital text communication (DTC) has transformed the way people communicate. Static typographical cues like emoticons, punctuation, letter case, and word lengthening (ie. Helloo") are regularly employed to convey intonation and affect. However, DTC platforms like instant messaging still suffer from a lack of nonverbal communication cues.

Past research has shown that kinetic typography can consistently convey emotion, while some animations are more strongly tied to specific emotions [1][4]. Past efforts to incorporate kinetic effects into instant messaging focused on motion typography of entire statements, with emphasis on changing the location of the word [1][1]. Because the animated words are translated significantly in a 2D space.

Students in CS 376 produced published work-in-progress research at UIST 2013, 2014, and 2015.

FUTURE VISION. As our HCI curriculum continues to evolve, my primary goal will be to continue improving CS 247's design studio pedagogy. To complement CS 247's positioning as a core class for the HCI curriculum, I hope to create an upper-division course in crowdsourcing and social computing design. Contrasted with the introductory HCI sequence, the goal of such a class will be to teach *emergence* as a part of HCI design. Online systems such as Wikipedia must generate emergent collaborative outcomes, but they can only design for individual-level interactions. While some platforms such as FoldIt and Facebook succeed, many more fail. Emergent design is in general a very difficult problem, and one not covered well by the more traditionally individualistic and task-based HCI curriculum. The course will ground students with studies of motivation, participation, and influence in crowdsourcing and social computing platforms. Students will be challenged to create systems based on paid or volunteer crowdsourcing platforms that extend the state of the art in large-scale human collaboration.

I believe strongly in expanding the set of perspectives engaged in Computer Science. To this end, I have actively encouraged cross-campus enrollment in each of my classes. The resulting student teams have included participants from areas such as Science, Technology, and Society; Symbolic Systems; Communications; Biology; The Graduate School of Education; Mechanical Engineering; Civil Engineering; and Psychology. Especially in my graduate research course, the presence of these perspectives lends new insight into each topic. Moreover, the HCI program has been a popular route for under-represented groups in Computer Science. For example, in 2012-2013, the average course enrollment in HCI courses was one-third women, roughly 1.5 times greater than the Computer Science department's one-in-five statistic at the time. I will continue to seek opportunities to engage new communities of students, minimize face threat (especially when critique feedback can be negative), and broaden the set of studio theme topics available to our students.