One challenge is that of adding musical scores to stories. Our UnderScore system analyzes music and allows producers to automatically add music to emphasize important parts of the their stories. With UnderScore and other tools, we aim to allow producers to think of and edit their stories in terms of high-level content as opposed to low-level waveforms.

Actuated Tensegrity Structures for Dynamic Locomotion

Andrew Sabelhaus, apsabelhaus@berkeley.edu
http://tinyurl.com/TensegrityRobots
Combining the popular mechatronics paradigms of soft robotics and bio-inspiration, actuated Tensegrity structures offer opportunities for unique movement and locomotion methods. Tensegrity robots are comprised of purely tensile and compressive elements (cables and rods) that change shape when their tensions are adjusted. Based on prior work that used machine learning techniques to develop control laws for such actuation, this research seeks to create a physical realization of a Tensegrity robot.

Sauron: Embedded Single-Camera Sensing of Printed Physical User Interfaces

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3D printers enable designers to rapidly produce models of future products. Today these physical prototypes are mostly *passive*. Our goal is to enable designers to turn models produced on commodity 3D printers into interactive objects with minimal assembly or instrumentation. We present Sauron, an embedded machine vision-based system for sensing human input on physical controls like buttons, sliders, and joysticks. Sauron automatically modifies the interior geometry of a designer's object so that, when printed, all components can be sensed by adding a single inward-pointing camera.

MOOC Analytics

Kristin Stephens-Martinez, ksteph@cs.berkeley.edu
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Massive Open Online Courses (MOOCs) have tens of thousands of students enrolled in an online course at once. With so many more students than physical classrooms and lots of new kinds of information recorded, how can we use it to make things better? My goal is to find and automate ways to find interesting things in MOOC data. Then I will also find how best to visualize that information for teachers.

Ambient Stress Detection

David Sun, davidsun@eecs.berkeley.edu
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Stress has a profound impact on the emotional, cognitive and physical well-being of people. Routine and unobtrusive monitoring of stress would enable a variety of treatments, from break-taking to calming exercises. Custom sensing is a poor option, because of the barrier to entry even before stress-related problems are evident. In this work, we explore ambient stress detection from peoples everyday interactions with commodity devices including cellphones and the computer mouse.

Speech-Enabled Games for Language Learning

Anuj Tewari, anuj@eecs.berkeley.edu
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Lack of proper English instructions is a major problem for a variety of populations around the world. This lack of exposure poses various serious problems, including a barrier to entry into mainstream society. At the Berkeley Institute of Design we explore a variety of topics like mobile phone games for language learning in developing countries, pronunciation feedback for Hispanic children and question-answering technologies for preschoolers. Details on some of these projects can be found here: http://www.cs.berkeley.edu/~anuj/language_learning_games

Ingenuity Lab: Making and Engineering through Design Challenges at a Science Center

Jennifer Wang, jennifer_wang@berkeley.edu
http://best.berkeley.edu/~jen
My research studies how to increase access and interest in engineering through tinkering spaces at public science centers, in particular at the Ingenuity Lab at the Lawrence Hall of Science. I implement an innovative cross-community design of Ingenuity Lab programs involving engineers, students, and educators and analyze its impact on the learner experience. Through observations, surveys, and interviews, I study learners' engineering-as-"tinkering" experience, persistence in the activities, and potential consequences for long-term interest.

Berkeley Institute of Design
http://bid.berkeley.edu

The Berkeley Institute of Design (BiD) is a research group that fosters a new and deeply interdisciplinary approach to design for the 21st century. We are an active research group with a focus that spans human-computer interaction (HCI), mechanical design, education, architecture, and art practice.

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Topic-Driven Adaptive Exercises

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Adaptive technologies in various assessments have long been able to present a progression of difficulty in questions that is based on past performance. This project investigates how student engagement is impacted by an adaptive system that also customizes the progression of question topics. Not only is the difficulty of the questions customized to the user, but also the progression of topics to ensure competency in prerequisite topics before advancement.

Urban Analytics and Kinectograph

Derrick Cheng, derrick@eecs.berkeley.edu
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I work with Professor Canny in behavioral data mining. We are currently working on a project in Urban Analytics, in which we are analyzing community feedback on topics related to urban planning and development. In addition to this work, I am also involved in a project called Kinectograph - an automatic body tracking camera for DIY tutorials.

DemoCut: Generating Concise Instrucional Videos for Physical Demonstrations

Peggy Chi, peggychi@cs.berkeley.edu
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DemoCut is a semi-automatic video editing system that creates amateur instructional videos for physical DIY tasks. It asks users to mark key moments in a recorded demonstration. Using audio and video analysis, our system automatically organizes the video into meaningful segments and applies appropriate video editing effects, including subtitles, fast motion, leap frog, zoom, and skip.

Fostering Deep Engagements with Technology

Laura Devendorf, ldevendorf@ischool.berkeley.edu
http://artfordorks.com

Working at the intersection of the art and computer science, I design and study technologies for creativity, self expression, reflection, and discovery.

Turning Sustainability From a Burden into an Innovation Tool

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Sustainability has historically been seen by designers and engineers as a burden–a further constraint on them. This new design method instead uses sustainability points of view as tools for innovation. It uses a combination of whole-systems and life-cycle thinking to break down assumptions and lead engineers to reformulate problems for radical reductions in environmental impacts while also improving functionality, business viability, and user experience.

Design Informatics: Leveraging Crowds to Create Better Designs

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http://www.markfuge.com

What makes a particular design good? How do we make new designs better? My line of research attempts to answer those questions by using data-driven techniques to study large sets of human generated designs an approach I refer to as Design Informatics. By using probabilistic inference over large databases of designs, we can extract why certain designs are better than others and shed light on the principles or processes that are used to construct new designs. This approach has been used to propose and answer several design questions, such as: What makes certain design more creative than others? How are design methods related to each other? How do collaborative design challenges operate?

Human-Inspired Technology

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Humans are highly evolved beings with computational capabilities that modern algorithms can rarely achieve. This is particularly true in the area of complex learning and visual perception. I am interested in modeling human performance in different areas and designing technology inspired by these abilities.

Human-Centric User Research to Identify Disruptive Opportunties in Convergent Paper and Digital Use

Euiyoung Kim, euiyoungkim@berkeley.edu
http://euiyoungkim.wordpress.com

Although digital devices have their own unique features that differentiate them from other tangible types of resources for reading, writing and sketching, a majority of people still prefers traditional paper media as it provides better user experiences in many aspects: readability, portability, ease of making annotations, shared reading, tactile sensory experiences, etc. This research will identify barriers and opportunities for paper-like features based on various human-centered design methods and explore a new product concept driven by this research. Based on this design research, we propose to design conceptual prototypes along with use scenarios.

Using AI to Extract Information from Charts

Nicholas Kong, nkong@cs.berkeley.edu
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Visualizations and charts must be carefully designed for their audience, but even the best designed charts are not ideal for every viewer. We apply image and natural language processing techniques to charts to extract information that can help improve the utility of visualizations for users. We have used these techniques for chart redesign and overlays for charts, and are working on associating text with marks (such as bars or lines) in the chart.

Internet-based Collaboration

Mitar Milutinović, mitar@tnode.net
http://mitar.tnode.com

My research interests are e-democracy, deliberative democracy, collective intelligence, trust networks, group decision support systems, collaboration tools, peer-to-peer and distributed systems, wireless mesh/community networks, organic/self-healing technologies. Currently, I am working on a novel platform for enriching the experience of open access scholarly literature called PeerLibrary (http://peerlibrary.org/) and on a voting scheme which uses a social network between voters to find a better overall group decision.

Human Potential Technology

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My research focuses on Human Potential Realization. HCI has been supporting efforts to help people realize goals that are externally imposed and time bounded through CSCW and Mass Media technology. Recently Persuasive and Behavior Change Technologies have been supporting short term intrinsic goals. However there seems to be a gap in technology development for long-term intrinsic goals, those so-called life goals, such as having a healthy, stress-free life, being a good father, or fulfilling a career, etc. I am researching the type of sensing, feedback, intervention and identity technologies, needed to help people realize such life goals. I am currently exploring machinima as a way to deliver interactive movies, sensor-less sensing, as a way to non-invasively detect affect and live journal data mining for auto biographical narrative study to support identity change.

Improving Editing Interfaces for Audio Stories

Steve Rubin, srubin@cs.berkeley.edu
http://ssrubin.com

Producers of radio shows, podcasts, and audiobooks face several challenges when editing raw footage into a final story.