**Global Technology For Social Innovation**
**Proposed new UCSC MS Degree based in Silicon Valley**
**Final Preproposal, March 31st, 2015**

*Mission*: Provide an interdisciplinary master's degree program that helps practitioners make more effective use of digital tools and technologies for social innovation; developing the skills and knowledge to more effectively build and support movements, organizations, and social enterprises that advance social justice and sustainability both locally and throughout the globe.

**Intellectual Content:**
The program would bring three distinct bodies of knowledge and expertise together:
- digital tools and technological innovations, focused on social development and sustainability;
- social science research on social and environmental justice;
- social entrepreneurship and social enterprise development.

These are three distinct bodies of knowledge and practice that all too often operate in isolation of each other. This program would explicitly bring these perspectives into conversation with each other, and the intersection would provide significant opportunities for innovation in learning and practice, at the cutting edge of efforts to address large-scale social and environmental problems. Our program would focus on low cost and accessible *information* and *sustainable technologies* that can be widely deployed to meet the challenges faced by global communities.

The master's program would allow students to concentrate either in sustainable or information technology systems that promote social innovation, while also gaining knowledge in the social science research, policies, and social practices that promote social and environmental justice. All students in the program participate in the following courses: three 5-unit core courses consisting of an introduction to global technology and social innovation (fall), digital tools and data methods (winter), and project formulation, including field methods, public communication, financing and funding mechanisms (spring); a 5-unit course (with an associated 2-unit project lab) focused on global poverty and inequality, social difference (e.g. race, gender, class), social movements and power, and the power dimensions of technology and technological artifacts; two 5-unit technology track courses, from either the information technology or sustainable technologies track along with two 2-unit labs; and a final 10-unit intensive capstone course on Innovation and Entrepreneurship where students discover a financially and ecologically sustainable model for their social innovation (note: the graduate division is also developing this course as a separate certificate program). The 2 sustainable technology courses would include topics such as remote automated systems (including robotics, sensors and actuators), renewable energy systems, and sustainable food, water and waste treatment technologies. The information track would include courses on data mining and scraping, social media and mobile computing, and educational media, art, and game design. For the final capstone project, students will work in teams with a silicon valley partner organization under supervision involving two faculty members and an outside community member (approved by the graduate committee).

Students would earn a total of 46 units for a MAS degree as a 12-month full time program (24-month part time). Students interested in completing an additional research-focused masters thesis and 2 extra technical courses would earn a MS degree over a 2-year (21 month) period. The innovative class structures would blend on-line webinars, evening classes, and weekend intensive workshops to fit the needs of full-time students and working students *in both Santa Cruz and Silicon Valley*. In addition, we will establish a 5-year BA/MS or BS/MS degree program (completing at the end of summer in the 5th year) for students in our existing BA and BS programs and a designated emphasis for our PhD students. Finally, with sufficient demand, we will offer a 2-week full-time intensive certificate course in social enterprise development in Silicon Valley that will be focused on international visitors and working professionals.

This graduate program would establish core research expertise and classes in Silicon Valley for building collaborations between faculty in Silicon Valley and on the main campus working in areas such as social justice, social enterprise, and information and environmental technologies. This program could serve as a platform for launching new master's and PhD programs in Silicon Valley involving societal and sustainable policy and information and sustainable technologies, combining resources with other programs in Silicon Valley as appropriate.

**Rationale:** Silicon Valley has been the global center of innovation in digital tools and technologies for over half a century. The people and companies developing these technologies, however, historically have had only limited insight into how advances in technology shape patterns of social, political, and economic development, and vice versa. Furthermore, relatively few technological innovators have focused on developing technologies to address the

glaring and growing challenges of economic inequality, social injustices, and potentially catastrophic environmental degradation.  Thus, it is imperative that we seek to better harness the powerful capabilities of technologies to directly address the goals of social justice and sustainability. Governments, NGO's, and industries in Silicon Valley, and beyond, are becoming increasingly interested in transforming their markets, and serving the needs of global societies as they seek to avoid these catastrophic changes that could lead to social and economic collapse.

Achieving these goals requires people who are skilled as both bridge-builders and innovators—innovators not only technologically, but also socially.  UC Santa Cruz has long been recognized as a leader in social equity and enterprise and will enter Silicon Valley, the world's leader in entrepreneurship, with a reputation of being able to bridge the gap between innovation and society to serve the needs of underserved communities. Our program has potential synergies with related programs in Silicon Valley, such as the Global Social Benefit Institute at Santa Clara University and the Program on Liberation Technology at Stanford University, but it is unique in offering a master's degree and specific training in social enterprise, social justice, digital tools and technology.  This program can strengthen our existing collaborations with NASA Ames, USGS, and the national labs (LBNL, LLNL, Sandia) as many scientists there are engaged in transitioning technologies developed for space, geological, military, and materials research to be deployed for the social good.   In addition, students will have ability to partner with the other organizations in Silicon Valley working on bringing social innovations to global communities.

**Existing Faculty Involvement:**  The proposed MS program would be an interdisciplinary program led by faculty in the Environmental Studies and Sociology Departments (Benner, McKay) with participation from faculty in Physical & Biological Sciences (Carter), and the Baskin School of Engineering (Lodha).  Benner (the Everett Chair) and McKay will lead the social justice, digital tools and social development core courses, Carter will lead the innovation and entrepreneurship capstone and sustainable technologies track, and Lodha will lead the social media, data methods and information technology track.  We have dozens of other faculty that are interested in social enterprise and its intersection with information, educational and sustainable technology, including faculty in Sociology, Economics, Psychology, Environmental Studies, Computer Science, Electrical Engineering, EEB, Physics, Chemistry, Earth and Planetary Sciences and the Art Division. If this proposal is selected to be developed further, we will work with faculty across campus to develop the curriculum and Silicon Valley collaborations.

**Enrollment Goals and Connections to Campus Research:**  Our goal is to enroll each year over 30 students in the MAS that complete the program in 1-year and over 15 students in MS program that complete the program over 2-years, resulting in overall enrollments of 60 students.

This program builds on the campus core strengths in social justice, and established programs and centers like the Everett Program and the Science & Justice Research Center, and our digital tools, sustainability, and technology strengths through established centers and programs like the Center for Integrated Spatial Research, the Center for Sustainable Energy and Power Systems, the Center for Statistical Analysis in the Social Sciences, the Santa Cruz Laboratory for Visualization and Graphics, and the Carbon fund.  It will capitalize on our existing collaborations with government, such as NASA Ames and US Geological Survey, numerous non-governmental organizations, and Silicon Valley industries, foundations, and venture funds interested in supporting social enterprise, such as Google, Ebay, Facebook, ImagineK12, Silicon Valley Social Venture Fund, Social Venture Network, Silicon Valley Leadership Group, Hewlett, Moore and Packard Foundations.  I addition, it will provide faculty that can help build master's and PhD programs in areas around social equity, remote sensing, sustainable energy, food, water technologies, digital media for education, and data science for the social good. Finally, the program aligns with several of the Presidents Initiatives, including the Global Food Initiative, the Innovation, Entrepreneurship and Technology Commercialization Initiative, and the Carbon Neutrality Initiative.

**Target Market and Evidence of Demand:**  The target market is people working for NGO's, industry, or government who are interesting in harnessing digital tools and sustainable technologies in support of social justice and sustainability.  Many leading companies in Silicon Valley, such as Google, Ebay, and Apple, have sustainability offices that hire employees trained in this area and fund social enterprises to use technologies to solve global sustainability challenges.  Numerous foundations have provided funding to social entrepreneurs, including Skoll Foundation, the Omidyar Network, the Schwab Foundation for Social Entrepreneurship, the National Social Entrepreneurship Forum, and Echoing Green, to name a few, providing billions of funding to thousands of social entrepreneurs.

According to the Global Entrepreneurship Monitor ((http://www.gemconsortium.org) 2011 survey results, entrepreneurship has been increasing as a career choice, with over 12% of US Adult population, or 29 million adults, running or starting new businesses in 2011, with a growing number doing it to pursue promising new opportunities

rather than as a necessity.  Additionally, the highest interest (20%) is for the 25-34 age group, suggesting that targeting the master's level would service a wide segment of the population. The participation of women, immigrants and underrepresented minorities is greatest in social innovations; therefore, providing training in this area creates a clear pathway to include more women and minorities in technology-focused entrepreneurial training and careers, a goal that is a top priority for Silicon Valley.  Providing access to training in digital tools, technologies, and practical entrepreneurship can increase business success rates, reduce unnecessary expenditures, and increase chances for outside funding.  As one example, the lean Launchpad/I-Corps model (originally developed by former UCSC trustee Steve Blank and which our capstone course is based on) has been shown to lead to greatly improved (60% versus 18%) chance of receiving NSF SBIR funding.

In addition to drawing undergraduate students from Silicon Valley interested in technology and social entrepreneurship, we anticipate that this program will draw UCSC undergraduate students that are Sociology and Environmental Studies majors, as well as students in Economics and Politics interested in comparative political economy and global enterprise, Education and Psychology students interested in educational innovations for underserved communities, students in Computer Science interested in information sciences applied to social entrepreneurship, and students in Physics, EE, Chemistry, EPS, and EEB interested in developing sustainable technologies to meet social needs.  Consequently, our master's program can service a substantial fraction of our undergraduate students (many of whom are from the Bay Area) by providing them additional interdisciplinary skills and research training, mentoring and alumni networks, and internship and partnership opportunities with Silicon Valley organizations to help our students find positions in Silicon Valley and/or create their own job.  We note that this master's program will particularly benefit our students in the social science division who currently have limited masters programs at UCSC to choose from and who could take advantage of a 4/1 BA/MS (or BA/MAS) program.

**Resources Needed:**  We anticipate hiring 3 tenure-track faculty positions to focus on the master's program to start.  These faculty would increase their participation in doctoral and undergraduate research and education once the master program transitions towards being supported off of enrollments.  At build-out, enrollment in the program itself will be used to hire lecturers and TAs/GSIs for a majority of the courses, support the program director course buy out and graduate advisor, and cover administrative and marketing costs.  We estimate that the budget will be $220K/year at build out, which includes funding for ladder rank faculty to teach 4 courses (course buy-outs at $14K/class), 4 lecturers (at $10K/year), 3 lab TAs (at $12K/year), one full time program advisor and internship coordinator (at $73K/year), and marketing and administrative costs ($15K/year).   In addition, the capstone course will utilize the Innovation and Entrepreneurship summer intensive course that graduate division is already developing as a certificate program with help from our entrepreneurship and innovation center, our entrepreneurial alumni, and additional support through summer enrollments.  With 20% non-resident enrollment and 60 masters students, the masters-incentive-funds (MIF) allocated to the division and program are sufficient to cover all of these costs, and still leave over $500K of masters tuition revenue going to the CEPVC to support doctoral students and infrastructure, in addition to state funds.  Therefore, this program does not require a PDST, allowing us to readily open our classes to other students without introducing complications regarding payment of the PDST fee.

The faculty members will include an *associate or full professor in social entrepreneurship* who will be the program director, hired through an open search across all divisions (with the possibility of filling the Kapany Professorship in Entrepreneurship) and with the candidate having the choice of department to join.  A new ***tenure-track assistant professor in social policy, equity, and/or economics,*** will be hired with a focus on the use of digital and data science tools, and a home department in sociology, economics, politics, or environmental studies.  Finally, a ***tenure-track assistant professor in technologies for social innovation*** will be hired with a focus in remote sensing, sustainable energy, water or food systems, and/or related data science-methods and a home department of environmental studies, computer science, earth and planetary sciences, or electrical engineering.

Lecturer support will focus on practitioners in the field of social innovation, from Silicon Valley industry, NGO's, and NASA Ames or USGS.  Some of these lecturers would be appointed as adjunct professors to serve as project mentors for the master's students, and research mentors for doctoral and undergraduate students at UCSC.

We anticipate needing 6 offices, 3 for the faculty (including the program chair), 1 for a graduate advisor, and 2 larger shared offices for adjuncts and lecturers.  We will also need a large communal "digital lab space" and lounge for the graduate students, and access to a lecture and seminar room capable of holding at least 50. The Silicon Valley faculty laboratories for the technology portions will be located at collaborating institutions in Silicon Valley or at the NASA Ames campus.  While not required, we recommend that the campus consider shared lab space at 2300 Delaware, Building C for all faculty (on and off campus) participating in the Silicon Valley-related research and teaching to facilitate research collaborations with main campus and to provide access to facilities (i.e. wet labs) that may not be available to students primarily working in Silicon Valley due to costly infrastructure.