

Frugal Innovation Hub

SANTA CLARA UNIVERSITY SCHOOL OF ENGINEERING



Fall 2016 Newsletter

School of Engineering, Santa Clara University

Upcoming FIGS (Frugal Innovation Gatherings)

She Started It Screening

January 24th, 2017 @ 6:00pm

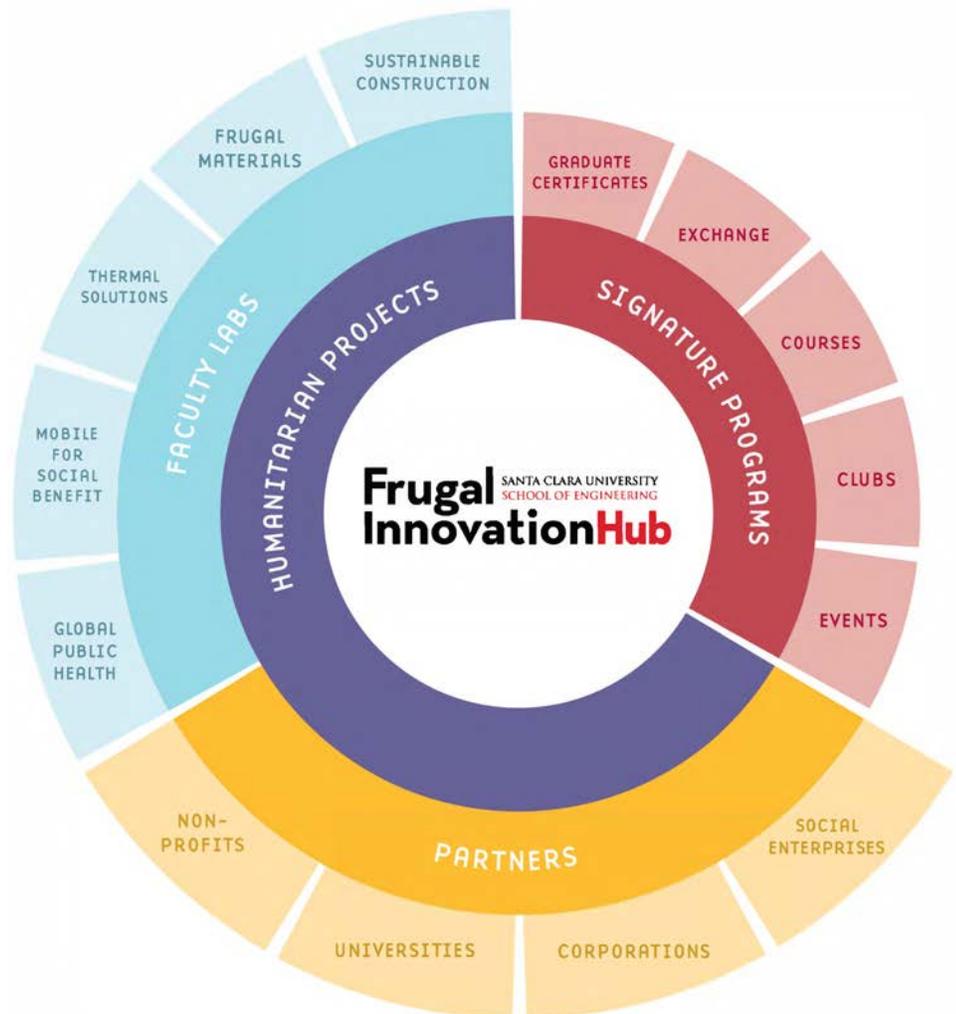
In partnership with the Leavey School of Business and the Global Women's Leadership Network, the Frugal Innovation Hub is proud to offer a screening of the documentary She Started It. The film follows five women as they work to create their own technology businesses, showcasing successful role models for young women around the world. A panel of female entrepreneurs and investors will immediately follow the screening, sharing their own experiences and offering time for audience discussion. The event will take place in the Recital Hall on SCU Campus; feel free to reach out to fil@scu.edu for more information.

BMNT Partners Lunch Session

February 9th, 2017 @ 1:00pm

BMNT Partners based in Palo Alto, will be presenting about the work they do to solve national security problems through the application of Lean Startup principles combined with an unparalleled network of Silicon Valley and government partners. They are looking for Santa Clara University students to be interns during Summer '17! Join us for pizza and more information (that's right, pizza) in the Frugal Innovation Hub. RSVP here.

fil@scu.edu



The Frugal Innovation Hub

We connect incredible organizations dedicated to social benefit with faculty and students in the School of Engineering that work so hard to make the world a better place. We help the helpers, through partnerships and programs.

Project Highlight: Solar Lights in Africa

For their Senior Design project last spring with **Dr. Timothy Healy** and the Lightyear Foundation, Alejandra Huitron '16 and Nicholas Supan '16 (electrical engineering) designed educational lantern kits with a solar charging system and lesson plans for assembly to teach high school students in Ghana how to bring lights into their homes. This summer, SCU Global Scholars Catherine Murray '18 (mechanical engineering) and Nick Redfield '18 (political science), supported by Bright Generation Community Foundation and SCU's Frugal Innovation Hub, took the Solar Lights project to Abengoa, Ghana. They installed a solar panel in the rural community and brought lantern kits to the teachers and schoolchildren. Watch this video of their experience bringing light to Ghana.



Engineering for the Developing World

Engineering for the Developing World, a graduate engineering course taught by Dr. Francine Gordon, hosted a panel with several leaders in frugal innovation and sustainable development. Among the panelists was Sabore Ole Oyie of Sabore's Well, an organization that drills boreholes to help the Maasai community bring water collection points closer to villages. Sabore shared his experiences with dealing with various water contaminants, active sabotage of their wells, and implementing holding tanks to manage water flow. Thank you to Jeffrey Chow (Collaborate for Africa) for the introduction!

DayOne Response

Dr. Craig Stephens introduced Tricia Compas-Markman, Founder and CEO of DayOne Response, Inc. to speak to our Engineering World Health Club students. DayOne Response has developed a product that allows for water to be cleaned, stored, and transported in just thirty minutes. It is geared toward emergency relief and preparedness, as well as military use. Ms. Compas-Markman shared her experience in research, development and design of the product, as well as the inception of her company and pillar partnerships. Ms. Compas-Markman was also recognized as a Tech Laureate for the Tech Museum of Innovation in 2016! To find out more, please visit dayoneresponse.com

Humanitarian Projects

Check out the amazing work being done by students and faculty in humanitarian technology at the Engineering.

HOME Project

In collaboration with CTA (Community-Technology Alliance), FIH students are continuing the development of the HOME application. This serves as an integral component of a cross-platform solution which will enable users currently using pen and paper in the field to use a mobile device to increase data accuracy and reduce paperwork. This application will be used by service workers who work with homeless individuals in Santa Clara County. Funded by Cisco.

Advisor: Dr. Silvia Figueira

Afrobarometer

Students working in the Mobile for Social Benefit Lab in the Frugal Innovation Hub have been working with Afrobarometer, an organization that aims to give ordinary Africans a voice in policy-making by tracking, analyzing, and amplifying citizen attitudes on democracy and governance, the economy, and other development issues. The project is working to build 60 inch digital touch-screen signage, similar to those found in malls, to contain and present Afrobarometer data. The idea is to have an interactive system that allows for people engaging with the tool to gain awareness and learn how to actively contribute to important issues facing Africans.

Advisor: Dr. Silvia Figueira

Engineering World Health Project Updates

Three inaugural projects through the partnership between Public Health and the Frugal Innovation Hub completed their first quarter of collaboration with **Dr. Michele Parker** (Public Health) leading the way. Public Health students presented to a group of faculty and students the culmination of their discoveries so far relating to the following School of Engineering Senior Design projects:

1. Phosphate Detection system for safe drinking water (**Dr. Unyoung Kim**)
2. Frugal Vitals Sensor (**Dr. Unyoung Kim**)
3. Breast Milk Chip to test the quality of maternal breast milk (**Dr. Unyoung Kim**)
4. Hip Arthroplasty Device to help in hip rotation surgery for obese patients (**Dr. Prashanth Asuri and Dr. Steven Woolson**)

ACM Dev and Summer Institute for Humanitarian Computing

Roshan Ramankutty '16 (computer engineering), research assistant in the Frugal Innovation Hub, presented a poster, "Compressing SMS Messages for Lowering Communication Costs in Rural Africa," at ACM Dev in Nairobi, Kenya, Nov. 18-20. Silvia Figueira (computer engineering) presented three posters at the same conference. Two of the posters, in collaboration with Dan Lewis, were the result of their Google-funded Summer Institute for Humanitarian Computing (SIHC). The projects were sourced from a partnership with Catholic Charities. More information about the papers presented and the SIHC program can be found here: [SIHC, ACM Dev](#)



Global Humanitarian Technology Conference (GHTC) 2016 & 2017

Silvia Figueira (computer engineering), Unyoung Kim (bioengineering), Tokunbo Ogunfunmi (electrical engineering), and 11 students presented six papers at the IEEE Global Humanitarian Technology Conference (GHTC 2016), Oct. 13-16 in Seattle, WA. One of the papers, "Quantification of a Latex Agglutination Assay for Bacterial Pathogen Detection in a Low-Cost Capillary-Driven Fluidic Platform," by On Shun Pak, Kyle Pietrzyk, Scott Fukuoka, Andy Ly, Andres Maldonado-Liu, and Unyoung Kim, won second place in the Best Student Papers Session. The Frugal Innovation Hub hosted an exhibition table. Silvia will serve as the vice chair for the 2017 GHTC to be held in San Jose.

More Upcoming FIGS!

On **January 12th at 6:30 pm** in the Frugal Innovation Hub, the Collaborate for Africa (C4A) meeting will be about creating, producing, delivering, and consuming educational materials. Participants include: Hesperian Health Guides, TeachAIDS, Georgia McInnis, MidPeninsula Media Center, Looma, eGranary, African Library Project, World Computer Exchange, and World Reader. Remember, it is potluck style; no need to RSVP, but if you come, please contribute something tasty! For those of you who can't make it physically, we are offering a Skype option (please email esweeny@scu.edu for more information).

On **March 9th at 6:30pm** in the Frugal Innovation Hub, the C4A meeting will include our very own Dr. Tonya Nilsson, Civil Engineering Lecturer and Faculty Advisor for the SCU Chapter of Engineers Without Borders. More information to come.

Recap and Opportunities

Nesta Research

Nesta, an innovation foundation based in the UK, is working with Fraunhofer ISI to study "frugal innovation and re-engineering of traditional techniques" for the European Commission. Researchers are using the Frugal Innovation Hub as a case study to assess how advanced technologies can be integrated in frugal solutions, and the relevance of frugal innovation to developed nations.

SIGHT Mention of Arsenic Project

IEEE's Special Interest Group for Humanitarian Technology (SIGHT) featured the AquaSift project, co-advised by Dr. Unyoung Kim, Dr. Shoba Krishnan, and Dr. Silvia Figueira, in their Fall Newsletter! The project, which is a sensor that detects arsenic contamination in sources of drinking water and maps its findings on a mobile application, is currently looking to incorporate the detection of phosphates and nitrates to its capabilities.

Birla Institute of Technology (BIT)

Faculty and administrators from BIT Mesra joined the Frugal Innovation Hub this fall to discuss potential interdisciplinary research collaborations relating to frugal innovation. Faculty and students who are interested in participating in joint research and potential exchange opportunities should reach out to esweeny@scu.edu.

Frugal Centre in Africa - University Collaboration

On June 15-16, 2017, the Centre for Frugal Innovation in Africa will hold an international conference in Leiden, The Netherlands, on Frugal Innovation for Sustainable Global Development. The organization is an interdisciplinary research center that is part of a strategic cooperation between Leiden University, Delft University of Technology and Erasmus University Rotterdam. The Frugal Innovation Hub is working with the Centre for Frugal Innovation to submit papers for the academic portion of the conference; **abstracts are being accepted now, deadline of January 15th.** For more information, contact esweeny@scu.edu.

Visiting Faculty from Germany to Teach Frugal Innovation in the School of Engineering!

We are so excited to announce that as part of the Frugal Innovation Graduate Exchange Program with Technische Universität Hamburg-Harburg (TUHH), Dr. Cornelius Herstatt will be joining us in the School of Engineering this Winter. Professor Herstatt will be teaching a special topics course in frugal engineering, ENGR 349, offered Wednesdays from 5:10-7:00 pm. The course will focus on the product planning and design for frugal innovation, and will count for the Engineering and Society requirement in the Graduate Core. Dr. Rajnish Tiwari of TUHH will also be joining us later in the quarter to participate in research with students and faculty in the Frugal Innovation Hub.

School of Engineering Faculty Highlight

Dr. Timothy Hight and Father James Reites

SCU's rEvolve House team was named the champion of the inaugural Tiny House Competition in Sacramento! Santa Clara University led the competition throughout the week in measured contests (lighting, energy use, hot water, etc.) and on the final day of competition, they won six of the twenty sub-categories (day lighting, integrated lighting, interior design, best kitchen, best program, and best tour) and two of the four main categories (energy and communications). Read more about the team's journey. Congratulations to faculty team leader Tim Hight and the entire undergraduate team. Their hard work and dedication to this project over the past two years have been inspirational and a great credit to our beloved Papa Reites, who passed away last April. He would be so very proud, as we all are.



BOK Ranch Project

For their graduate software engineering capstone course with Zoltan Kurczveil, graduate computer engineering students Ryan Lowe (right), Neha Soma, Jeffrey Wick (left), and Elizabeth Sweeny are working with BOK Ranch, a therapeutic horseriding nonprofit in Woodside, to create a new software platform for their day-to-day operations. They will be delivering a final product in Summer of 2017.

Noora Health

Through the Engineering World Health club, students in Public Health and Engineering are working together to create a Frugal Vital Sensor Kit that allows for basic diagnostics to be performed in rural areas around the world. Dr. Unyoung (Ashley) Kim (Bioengineering) advises the project, with support from Dr. Michele Parker (Biology/Public Health). With a gracious introduction by the Miller Center for Social Entrepreneurship's Global Social Benefit Institute, students and faculty working on the Frugal Vital Sensor Kit have been engaging with key leaders at a social enterprise called Noora Health. Noora Health works to train patients and their families in the skills necessary to improve medical outcomes. The partnership seeks to better understand how the product can be designed more intuitively and to be more impactful from the perspective of those operating in rural clinics of India on a daily basis.

Looma

The Mobile for Social Benefit Lab has been busy. Dr. Silvia Figueira has been advising several engineering students to work on educational tools for Looma, an affordable and low-power device that provides interactive educational content to village schools in Nepal. Looma is currently being developed by VillageTech Solutions, which works with resource-limited schools to provide basic necessities for education.

Projects to Work On

If you're interested in working on any of the following projects, contact esweeny@scu.edu with the name of the project in the subject line.

Organization: Nebras
www.nebras-eg.com

Mission: Helping customers in the private and public sectors reduce operational costs required to sustain their growth while contributing to environmental sustainability.

Project: Developing a SMART electric meter to create two-way communication between MDMS and individual electric devices at users' sites.

Organization: Sumbon
www.sumbon.com

Mission: Build a transparent marketplace focused on individual donors to help manage their charitable giving and see their aggregated impact.

Project: Build a mobile application for donations and impact assessment.
(Wireframes have already been built!)

Organization: Northwest Earth Institute
www.nwei.org

Mission: Inspires people to take responsibility for Earth.

Project: A mobile application that supports behavior change for shifting everyday environmental practices of individuals. It would serve as a critical bridge between courses and other platforms as a way to better track participation and impact.

Organization: Chef Koochooloo
www.chefkoochooloo.com

Mission: Bring families together to discover the world through healthier cuisines and lifestyles.

Project: Expand an iPad application to iPhone and Android that will allow nontechnical personnel to input recipes and other data into the system.

Engineering World Health Course in Winter

The Public Health Program, School of Engineering, and Frugal Innovation Hub (sponsored by a STEM Convergence Grant) is offering a course in Winter 2017, taught by Dr. Craig Stephens and Dr. Michele Parker. PHSC 193 (2 units), offered Mon/Wed 11:45-12:50, offers a global health introduction that includes social and environmental determinants of health, the UN's Sustainable Development Goals, an overview of existing health systems and resources in low-income countries, and identification of global health issues that are amenable to frugal technological solutions. **Engineering students are encouraged to enroll!**