

Natural hazard mitigation awareness through 24-hour Design-a-thon engineering competition

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Engineers and scientists help to mitigate natural hazards such as earthquakes, floods, hurricanes, tsunamis, and droughts. As the global population increases and the climate changes, it is more necessary than ever for engineers to mitigate the damage and losses from natural hazards in a sustainable manner that is affordable, minimizes environmental impacts, and is equitable for all. To prepare for this challenge, engineers with a passion for sustainability and interest in natural hazard mitigation are needed. The Center for Bio-mediated and Bio-inspired Geotechnics (CBBG) at the University of California, Davis hosted its first Design-a-thon competition from April 28-29, 2018 to interest students in sustainable natural hazard mitigation. The overall goal of the Design-a-thon was to promote interest in engineering, bio-inspiration, the United Nations Sustainable Development Goals, awareness of the natural hazards that society face, and development of creative thinking skills. The event also provided students with an opportunity to practice teamwork, oral presentation, and entrepreneurial skills. The event, open to undergraduate students of all majors, challenged participants to develop an engineering idea or design to aid in alleviating the effects from a natural hazard of their choosing. As an incentive for students to participate, prizes were available to the top three teams and meals, snacks, and swag were provided. Design-a-thon workshops on bio-inspiration, geotechnical engineering, liquefaction and earthquakes, Solidworks, and life cycle assessment provided background information, inspiration and motivation to the participants. Over the course of 24 hours, students worked in teams of 3 or 4 to develop their idea and prepare a presentation that demonstrated its potential for evaluation by a panel of judges. Attendance for this event was low, however, the interest and quality of work from the participants exceeded our expectations. After identifying lessons learned, CBBG decided to host another Design-a-thon from October 13-14, 2018 on a more narrowly-defined topic – earthquake mitigation. Based on instructor observation and participant evaluations, a majority of the workshops hosted were informative, interesting, and useful. Evaluation also highlighted barriers to a more successful outcome, including the need to distinguish between a Hackathon – which this competition is derived from – and the Design-a-thon and the timing of the competition needs. This poster will present an overview of Design-a-thon goals, implementation, and evaluation processes and results. It will include a discussion on lessons learned which will cover the appropriate audience (e.g., first-year students or disciplinary-trained students), effective strategies for conveying knowledge of sustainable engineering solutions, and strengths and weaknesses of the two Design-a-thon implementations. The poster will conclude with recommendations for other organizations considering similar outreach events.