

Grace Hopper Celebration Final Submission Materials

Ripple Effects: Increasing the Diversity of Creators and Consumers of Computing Technology

ABSTRACT

Despite major advances in computing technology and initial adoptions of this technology around the world, many developing communities have not benefited from computing technology to date. This panel will focus on our newest “wave” of efforts to increase diversity, beyond gender, in the creators and consumers of computing technology so that computing technology becomes relevant and accessible to developing communities. Many of our panelists champion the cause for gender diversity in computing. In this panel we will describe our newest initiative, TechBridgeWorld, which innovates and implements technology solutions to meet sustainable development needs around the world, through strong partnerships with developing communities. Specifically, this panel will focus on our educational initiatives that provide our students and faculty with non-traditional opportunities to learn about and work with developing communities towards relevant and sustainable technology solutions, and to also develop technology tools catered specifically to education in a developing community context.

PANEL PARTICIPANT BIOGRAPHIES (in speaking order)

Carol Frieze is Director of Women@SCS (<http://women.cs.cmu.edu>) and co-Director of the Sloan funded Women@IT program. She is currently a Ph.D. candidate in the School of Computer Science. Her research focuses on culture and gender, in particular the culture of computing. Frieze has worked with Women@SCS for the past 6 years and brings to the organization an interdisciplinary and diverse perspective, having taught Cultural Studies in Carnegie Mellon's English Department, and having a previous background in inner-city high school teaching and hospital teaching in England.

M. Bernardine Dias, TechBridgeWorld Founder & Director, is a faculty member in the Robotics Institute at Carnegie Mellon University's School of Computer Science, with research experience in technology for developing communities, automated team coordination, planning and navigation for rovers, and technology education. Her administrative responsibilities include building and overseeing collaborative outreach efforts between Carnegie Mellon and developing communities around the world. Dr. Dias is a native of Sri Lanka. Her long-term career goal is innovating means of developing and disseminating suitable and sustainable technology for empowering developing communities.

Joseph S. Mertz, jr., TechBridgeWorld Associate Director, is an Associate Teaching Professor in the School of Computer Science and in the H. John Heinz III School of Public Policy & Management at Carnegie Mellon University. His primary teaching interests are in courses and projects that make students aware of community development challenges while teaching strategies and methods to use information and communication technologies to address those challenges. He directs the Technology Consulting in the Global Community program, which sends university students abroad as technology consultants with government ministries and non-profit organizations in developing communities.

G. Ayorkor Mills-Tettey, TechBridgeWorld Student Representative and 2006 Google Anita Borg Scholarship recipient, is a Ph.D. candidate in the Robotics Institute at Carnegie Mellon University's School of Computer Science. Her interests and research activities include robotics path planning, teaching, and understanding the synergies between technology and education, especially in developing communities. A native of Ghana, Ms. Mills-Tettey attended Dartmouth College from which she graduated with degrees in computer science and engineering. In her role as a TechBridgeWorld student representative, she is responsible for liaising with other students and participating actively in the development of new and existing TechBridgeWorld programs.

Ling Xu is a Ph.D. candidate in the Robotics Institute at Carnegie Mellon University. She graduated with a bachelor's degree in Computer Science from Carnegie Mellon in 2004. She worked for a year in industry before joining the Robotics Institute as a National Science Foundation graduate fellowship recipient. She currently works on a V-Unit project to develop an American Sign Language tutor for deaf students in Pittsburgh. She also actively participates in Creative Tech Nights, an outreach program to introduce middle and high school girls to Computer Science.

Sarah M. Belousov, TechBridgeWorld Project Assistant, is based in the Robotics Institute at Carnegie Mellon University's School of Computer Science. Her primary responsibilities involve logistical coordination and administrative duties in support of extending the activities of the TechBridgeWorld program at Carnegie Mellon University's campuses in Doha and Pittsburgh. She graduated from the Johns Hopkins University with an international studies major and French minor and studied abroad at l'Institut d'Études Politiques in Paris. Prior to joining TechBridgeWorld, Ms. Belousov worked at the World Affairs Council of Pittsburgh and participated in the Leadership Development Initiative XII, a program of Leadership Pittsburgh, Inc.

Ariadna Font Llitjós is a Ph.D. candidate at the Language Technologies Institute in the School of Computer Science at Carnegie Mellon University. She has been actively involved in promoting and mentoring women in computing and technology through Women@SCS since 2001. She received a Google Anita Borg Scholarship in 2005 and the SCS Graduate Student Citizenship Award in 2004. Her research centers on automatically improving existing Machine Translation systems, focusing on resource-poor scenarios. As part of the TechBridgeWorld initiative, she spent a summer in Peru building a Spanish-to-Quechua Machine Translation system, which can now be improved with her Automatic Rule Refiner.

Vinithra Varadharajan, a Masters Student at the Robotics Institute, School of Computer Science, is a recipient of the 2006 Google Anita Borg scholarship. She is currently working on a V-Unit project to design and develop an American Sign Language tutor for deaf students in Pittsburgh. In the summer of 2003 she taught English to a class of underprivileged middle-school blind students in India. She has also given presentations on India to high-school students in Pittsburgh as a volunteer for the World Affairs Council. Her career objective is to develop technology beneficial to the common man.

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Overview

Despite major advances in information technology and initial adoptions of technology around the world, many developing communities have not yet benefited from computing technology to date. This panel will focus on our new initiative, TechBridgeWorld, which innovates and implements technology solutions to meet sustainable development needs around the world, through strong partnerships with developing communities. Specifically, this panel will focus on our educational initiatives that provide university students and faculty with opportunities to learn about and work with developing communities on technology solutions, and also develop technology tools catered specifically to education in a developing community context.

Panel Discussion Topics

Diversity in Computing: Gender and Beyond

We will discuss the importance of diversity in computing technology, and will explore a variety of ways in which the culture we create can impact this diversity. This section will also present motivation for working towards relevant and accessible technology for developing communities.

An Introduction to TechBridgeWorld

We will present the founding and evolution of the TechBridgeWorld initiative and will provide an overview of selected programs under this initiative. Primarily, we will focus on programs related to education technology – one of the most sought-after areas of interest to our developing community partners. TechBridgeWorld's education initiative includes programs under two primary thrusts:

Providing educational opportunities for university students to learn about the relevant challenges in innovating technology for developing communities

To realize the first goal we have created and currently teach courses such as *Technology Consulting in the Community, Technology and Global Development*, and *Technology for Developing Communities*. Additionally, we have developed programs to provide students with the opportunity to get field experience in developing communities. The *Technology Consulting in the Global Community* program is a global version of the technology consulting course and the *V-Unit: Learning to Build a Vision* is an endeavor to provide graduate students with the opportunity to pursue an independent study that broadens their perspective.

Creating technology aids for education relevant to and accessible by developing communities.

The second goal of our education program is developed in two directions: creating technology aids to allow improved access to basic literacy in developing communities, and creating computing-technology related courseware to empower developing communities. We will describe several projects relevant to these goals, including *Project Kané*, piloted in Accra, Ghana to explore the role that technology can play in improving English literacy among children with few opportunities for guided reading practice, and a new on-line *Open-Source repository of computing technology education courseware* made accessible and relevant to developing communities. Finally, we are developing two technology projects to improve literacy among deaf and blind populations: the design of technology aids for improving sign language literacy in a school for the deaf in Pennsylvania and a low-cost Braille-writing tutor to be deployed in a school for the blind in India.