

Contributions to Diversity Statement

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CONTRIBUTIONS TO DIVERSITY

Since my graduate study at University of Illinois, Urbana-Champaign, I have been committed to promoting diversity through my research, teaching, mentoring activities, particularly for students in engaging STEM fields. In what follows, I outline specific efforts and contributions to diversity.

Research: Some of my research work specifically aim for helping people with disabilities effortlessly access information and interact with others. For example, people with color vision impairment, commonly known as the colorblind, often have difficulty in differentiating certain color combinations. I have been working on developing computational tools for transforming the colors in an image so that the color contrast in the original image can be better preserved when perceived by the colorblind. The project led to several conference and journal publications, e.g., ECCV Workshop on Computer Vision Applications for the Visually Impaired (CVAVI), IEEE conference on Acoustics, Speech and Signal Processing (ICASSP), and IEEE Signal Processing Letter (IEEE SPL). The proposed algorithms were selected as representative algorithms for Daltonization (i.e., color vision correction) at <http://www.vischeck.com/>.

My work on eye-gaze tracking technology during my internship at Microsoft Research aims at developing natural interaction interface using eye gaze cues. These efforts could provide Amyotrophic Lateral Sclerosis (ALS) suffers to communicate with the world using their eyes. My work won the *Best Paper Award* at ACM Symposium on Eye Tracking Research and Application (ETRA) 2014 and was featured in UIUC ECE headlines and the Resonance magazine.

Furthermore, I believe that my research in computer vision will have long-term impacts on helping people with visual impairment. For example, computer vision algorithms can be used for helping blind or low-vision people effortlessly navigate in an unfamiliar environment.

Mentoring: Through the Promoting Undergraduate Research in Engineering (PURE) program at UIUC, I have been actively serving as a research mentor for guiding and encouraging underclassmen to explore research at an early stage in their academic career since 2012. Among eight of the mentees I advised, three of them were female students: Linjia Chang, Sakshi Srivastava, and Le Wang. My mentoring goal is to help them develop outstanding problem-solving skills and be passionate about their work. I also encouraged them to participate in various campus activities.

The effectiveness of my mentoring can be demonstrated through several aspects. First, mentee' work received recognitions. Sakshi was the recipient of the Best PURE project Award in 2012 and Le's work won the third place in a university-wide, interdisciplinary competition – Image of Research, hosted by the UIUC library in 2014. Second, their lasting enthusiasm on research led them to pursue their graduate studies. Linjia and Sakshi are currently graduate students at UIUC ECE department and Le is pursuing her study at Stanford University. Third, later they all took active leadership roles in the department and the engineering college. For examples, Linjia served

as a publicity director in Women in ECE (WECE). Sakshi and Le contributed back to the PURE program by serving as treasurer and publicity director, respectively.

Teaching: As a teaching assistant of a graduate-level course, I paid special attention to the mixed-ability class and the diverse backgrounds of the students. To cope with the mixed-ability class, I volunteered to give a tutorial on MATLAB programming. In my lectures and interaction with students during office hours, I kept aware of diversity issues and make sure that all students feel completely free to ask questions and share their thoughts. Students are also encouraged to ask questions anonymously through an online discussion forum (Piazza) if they felt embarrassing. I also make sure that the class and office hour won't be dominated by questions from a particular group of students, e.g., native speakers.

Service: I have contributed to diversity through my services such as giving technical talks, experience sharing and outreach. I gave an invited talk on my thesis research in one of the *WECE for ECE Undergraduate Technical Series*, hosted by Women in ECE. The event is for ECE undergraduates of all backgrounds who are interested in learning more about the diverse fields related to ECE. I was also invited to share my mentoring experience from PURE in the course *ENG 198 IEFX Research* in July 2015. These freshman students enrolled in the class were from diverse backgrounds. In my talk, I shared my mentoring experiences, discussed how to maintain effective communication with mentors, and introduced various resources, programs, and activities where they can get opportunities to explore research interests.

In Beckman Institute Open House 2015, I took charge of the exhibition on behalf of the Computer Vision and Robotics Lab. I applied my expertise in computer vision and computational photography and developed a real-time system that detects and tracks facial landmarks using a webcam. The program gradually morphs from one face it previously seen to the current face sitting in front of the computer. The exhibition was a huge success. The audiences all enjoyed seeing their "averaged faces" and how their faces gradually transformed into another face with different gender, age, ethnicity, or race. Through the interesting application, my goal is to let the participants become more aware of the diversity among people.

FUTURE PLAN IN FURTHERING DIVERSITY

As a new faculty member, I would like to take a leadership role in promoting diversity in the department and the university. I am particularly interested in participating in the activities for promoting my research to a broad audience, e.g., in a summer pre-engineering program. I would also be interested in hosting sessions in STEM program and help the underrepresented group of students explore their potential careers in science and engineering.

Building upon my previous experiences, I would like to continue mentoring and advising students from underrepresented groups and help leverage their full potential. In addition, I believe that my research in computer vision would greatly help improve lives of people with visual impairment.