DIVERSITY STATEMENT

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It may sound peculiar, but my robotics research has demonstrated the importance of diversity [1, 2]. Part of my research has developed methods that allow a robot to learn and use stereotypes to predict the needs of first responders during emergencies. The robot observes a person's visual characteristics in addition to the tools the person uses during a notional emergency, ideally learning that people that are dressed like a firefighter need specific types of information, tools, and support. These stereotypes accrete from the models that the robot learns by interacting with various different emergency personnel.

Our research has shown that when the robot's experience is limited to a narrow set of people it learns incorrect associations between a person's visual characteristics and their emergency needs. For example, during one experiment the robot interacted with five different firefighters, all of which happened to have a beard. The robot observed that one common trait among the people that it had met that were firefighters was having a beard. When asked to identify a new firefighter, the system searched for a beard and assumed that, because the person did not have a beard, it could therefore not be a firefighter.

Broadening the number and types of people that the robot interacted with was an effective cure to its narrow understanding of the world. As the robot interacted with a greater diversity of people, its categorical model of firefighter expanded to include females and older people. Moreover, when the robot's model of a category of people was based on a more diverse set of people, the robot could more accurately predict the needs of the emergency personnel that it was trying to help. Perhaps even more interesting, our research showed that the first exemplars that a robot encounters from a new category play a disproportionate role in establishing its understanding of the category. In other words, the first few firefighters strongly shape the category. It seems obvious when observing the learned rules of a silly robot that the stereotypes one holds are often wrong and that diversity is a key for developing a better understanding of different groups of people.

As a teacher and a mentor I strive to create a positive environment for whoever attends my courses. For example, while acting as a teaching assistant for a Georgia Tech course being taught in Korea I strove to bridge the cultural gap between the instructor's expectations and the student's misunderstandings related to plagiarism. I counseled the students about the reasons and rationale that make plagiarism a problem and how to avoid plagiarism in the future. When teaching my own courses I require students to sit next to new people on a weekly basis. Group projects are a staple of the courses I teach and group diversity is a selection criterion I use to guide the creation of student groups. Moreover, my courses are designed to be interdisciplinary and to attract students from interest areas outside of robotics. Although I am still developing new ways to create a diverse, inclusive learning environment, my experiences teaching and my research have shown me the value of doing so.

References

[1] A. R. Wagner, "Robots that Stereotype: Creating and Using Categories of People for Human-Robot Interaction," *Journal of Human-Robot Interaction,* vol. 4, no. 2, pp. 97-124.

[2] A. R. Wagner, "The Impact of Stereotyping Errors on a Robot's Social Development," in *Proceedings of IEEE International Conference on Development and Learning (ICDL-EpiRob 2012)*, San Diego, CA, 2012b.