



Introduction

Socially assistive robotics is a newer field that uses robots to assist users through social rather than physical interaction [1]. My partner Ipek and I worked specifically with our PhD mentor Thomas Groechel, who studies socially assistive robot tutors and student kinesthetic curiosity, or the expression of exploring new knowledge through movement and augmented reality [2]. Throughout the summer, we worked with a robot called Kuri to observe its movement and write programs to control it, which were meant to heighten user engagement and curiosity.



Fig 1. Kuri uses mixed reality and social expressivity.
PC: Thomas Groechel

Objective & Impact of Dr. Matarić's Research

Dr. Matarić's research focuses on using capabilities of socially assistive robots to better the lives of humans, especially vulnerable populations, and therefore has massive real-world implications. Work in the Interaction Lab involves studying and creating computational models for human emotions or behavior, such as trust, to influence the relationships or behavior of human users.

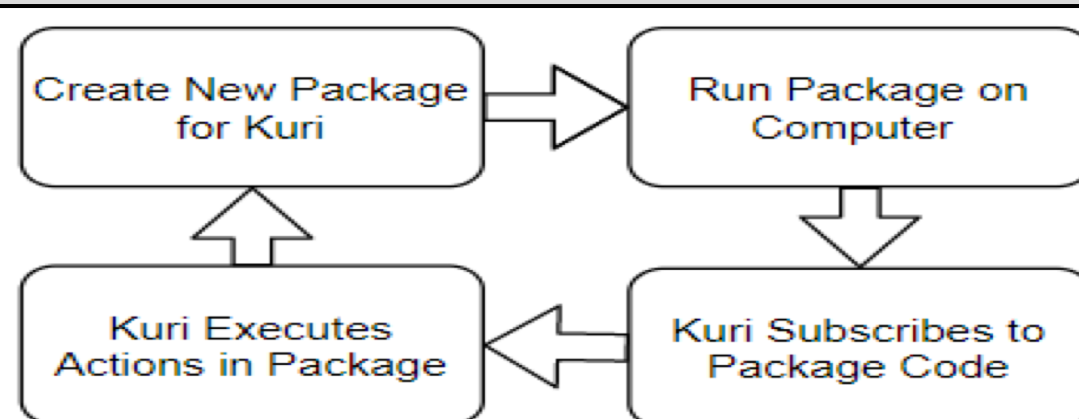


Fig 2. This is the process we used to develop programs, or packages, on Kuri.
PC: Mena Hassan

Skills Learned

Fig 3. Below are logos of software programs used to work with Kuri



Throughout our project, I learned how to:

- Navigate the terminal
- Use text editors such as Vim or Sublime
- Use ROS
- Use Github
- Work with MATLAB
- Understand multithreading in Python

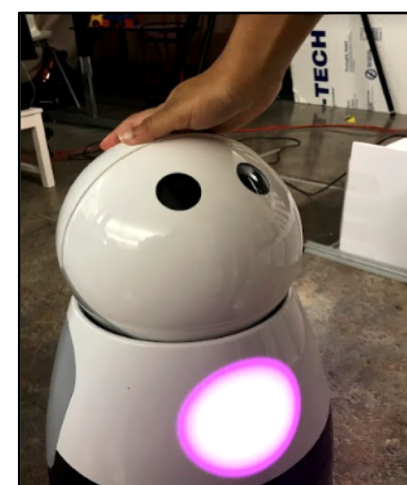


Fig 4. Kuri's chest LEDs change to pink when touched or pat on the head.
PC: Ipek Goktan

How This Relates to My STEM Coursework

In our work, I was able to use concepts from:

- AP Computer Science A
- Online programming courses
- Physics and engineering courses
- Coordinate systems and matrices in math

And I can apply these ideas:

- As a programmer for my school's FRC Robotics Team
- Through STEM clubs and activities
- In future web development endeavors
- In future computer science courses

Next Steps for Me & Advice for Future SHINE Students

I hope to attend a university as a computer science major. Ideally, I would be able to work in a research lab and continue exploring interdisciplinary aspects of computer science. My advice for future SHINE students would be to make the most of your time here, and don't be afraid to take on difficult tasks. Get to know your mentors and other SHINE students, and don't forget to enjoy your experience!

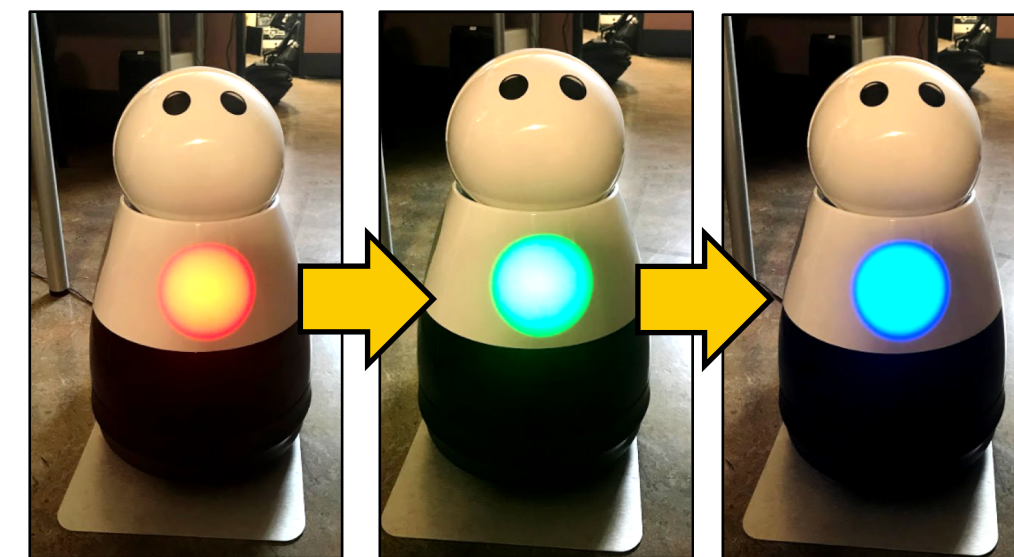


Fig 5. Kuri's display cycles through red, green, and blue colors. PC: Mena Hassan



Fig 6. Kuri's camera uses face detection to sense when a user is standing in front of it and approach them. PC: Ipek Goktan

References

- [1] Feil-Seifer, D., & Mataric, M. (2005). Defining socially assistive robotics. In 9th International Conference on Rehabilitation Robotics, 2005. ICORR 2005 (pp. 465–468).
[2] Groechel, T., Shi, Z., Pakkar, R., & Mataric, M. (2019). Using Socially Expressive Mixed Reality Arms for Enhancing Low-Expressivity Robots



Scan here with your phone camera to watch a video compilation of Kuri in action!

Acknowledgements

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