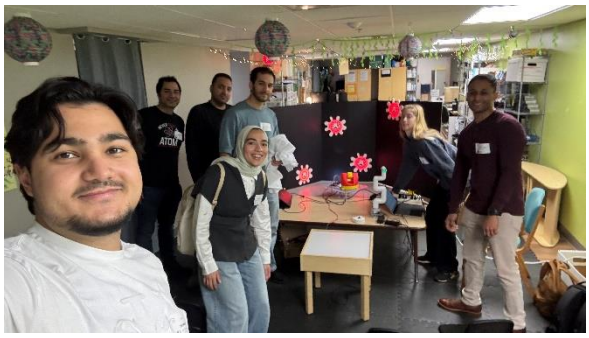
This Spring (March 2026), the HeaRT Laboratory successfully launched our second “Robot Day” activity with kids from St. Joseph’s Children’s Home. HeaRT lab students, Emma Webster and Behnam Moradkhani led the charge in developing a robotic turret for pre-K kids. The robot consisted of two SG90 servo motors programmed by an Arduino Mega. An integrated flashlight served as the end effector, with a built-in button for toggling the beam. The game’s objective was to hit four illuminated targets by directing the robot arm with it’s flashlight. Targets consisted of NeoPixel LED rings embedded in 3D-printed bacteria shapes, each containing multiple photoresistors in the eyes and mouth to detect direct light, all of which was connected to a custom PCB. Upon a successful hit, a target's LED transitioned from red to green with a rolling animation that formed a smiley face. Once all targets were hit, a celebratory "firework" animation played, and the game reset. The game setup included a portable foam trifold display board, with wiring connected to an Arduino Due and external power source, as well as a mini Bluetooth speaker that played background music. Teams that completed the



challenge received miniature 3D-printed trophies as a reward for their achievement. Future work will involve integrating a sound system for noise effects when targets are hit and on completion of the game. Also, manual trigger buttons on the gameboard in case of an activation error. For more information on how to do this yourself, follow this link.