



This Summer (August 2025), the HeaRT Laboratory successfully launched our very first “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 an interactive continuum robot building activity for pre-K kids. The first part of the activity was for each kid to construct their own scaled-



down version of a full-scale robot arm that they could take home. The robotic arm featured four restricted 3D printed universal joints to provide controlled horizontal and vertical motion as a result of pulling on three paracord tendons. In the scaled-down version, the tendons were twine. These mechanical constraints enhanced stability and simplified aiming. An integrated flashlight served as the end effector, with a built-in button for toggling the beam. The second part of the activity

was for groups of kids to rotate using the full-scale robot arm in a game after having familiarized themselves with the scaled-down version. 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. For more information on how to do this yourself, follow this link: <https://github.com/labrobotics4heart/RobotArmForKidsOutreach-1->