

Abdullah Almaroof and Julio Anacleto

TCES 430 - Autumn 2025

December 12, 2025

Project 4

Challenges Faced: Our primary challenge was determining which parts of the driver needed modification because it was originally designed for the Raspberry Pi 4, not the Raspberry Pi 5 that Julio and I use. Once we identified the differences, we had to find the internal GPIO pin number for physical pin 21. Interestingly, this value was board-dependent: Abdullah's board used GPIO 592, while Julio's used GPIO 590. After updating the driver, we created the Makefile and user space application, but the LED wouldn't blink when running the user program. We discovered that only root had permission to access /dev/etx_device. To resolve this, we modified the driver to set device file permissions to 0666 (read/write for all users) by adding an etx_devnode() function and assigning it to the device class. Once this was implemented, the application worked correctly for all users.

Contributions:

- Julio: Created original driver, Makefile, and user space application; wrote project report
- Abdullah: Debugged driver, Makefile, and user space application and implemented permission fix for device file access; wrote project report