Co-op Description

Team
- Embedded Algo Team
- Purpose in creating algorithms and software that can anticipate and identify health and wellness related events
- Products include fall detection algorithms, fall risk assessment algorithms, and step counting algorithms
- Workplace type: Fully Remote

Role & Responsibilities
Role: Embedded Software Developer
- Implement, integrate, test and release embedded software project
- Prototype the algorithm on next generation hardware device
- Learn and research on embedded system concepts
- Develop functional software specifications and/or tools under supervision
- Create, document and track tasks using proprietary issue tracking products

Benefits
- Employee Discount

Product: Lively Mobile

What is it?
- Personal Emergency Response device
- The fastest call response medical alert
- Go anywhere with it and reach certified Urgent Response Agents anytime

All-in-one medical alert
- 24/7 Help Response
- Lively Fall Detection
- Enhanced GPS
- Two-way communication
- FSIAHSA/HRA eligible
- More on web: https://www.lively.com/medical-alerts/lively-mobile-plus/

Technical Learnings

Key Tools
- STM32 Cube Embedded Software Suite
- Windows Subsystem for Linux (WSL)
- C (programming language)

Key Concepts
- Bluetooth Low Energy (BLE)
  A Low-power wireless technology used to link devices together
- Sequencer
  The sequencer executes registered functions one by one
- First in First Out (FIFO) buffer
  A method for organizing the manipulation of data buffer
- Serial interfaces (e.g. i2C)
  Communication protocol used in microcontroller development
- Sensor (Accelero, Gyro, Magneto)
  Used to detect the motion of the device.
  Read datasheets for setting and connecting

Project

Prototype algorithm for next generation product on selected sensor core Integrated Circuits (IC)

Accomplishments
- Implemented Lively Mobile Fall Detection on prototype hardware and successfully detected real falls.
- Implemented multi-sensor data acquisition on prototype hardware that will be used to improve fall detection.
- Prototyped Bluetooth Low Energy (BLE) communication protocol for tracking and geofencing to improve power consumption.
- Implemented a First in First Out (FIFO) buffering scheme for data acquisition to optimize motion data transfers.

Key Takeaways
- Fully Remote Working Experience
- Great Teamwork
- Technical Learning
- Keep On Learning New ways to tackle the Problems
- Standard Operating Procedures
- Do Not Hesitate To Ask Questions

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References

* Best Buy Health serves more than 95,000 seniors across approximately 1,000 facilities, and growing.*