Requirements and Engineering Standards

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Problem Statement

To research, design, prototype, test and demonstrate an embedded system that utilizes machine learning to solve real world problems, and decide whether the project could be integrated into the ISU curriculum.

To solve this problem we have chosen to design a voice operated ‘Smart Door Lock.’

Requirements

Follow project sponsors guidance to meet their requirements.

- Basic requirements
  - Use of embedded systems
  - Use of machine learning logic
  - Design within physical limits of microcontroller
    - (memory, cpu speed, etc.)
  - Maintain a reasonable budget for a lock system
- Requirements for implementation
  - Large dataset of voice files to train the algorithm
  - Include some form of external communication
    - (bluetooth, wifi, etc.)
- Use the skills we have learned from the “Coursera embeddedML” course

Engineering Standards

- IEEE standards
  - IEEE P2089- Standards for Age Appropriate Digits Services
  - IEEE P2660.1- Recommended Practice on Industrial Agents: Integration of Software Agents and Low Level Automation Functions.
  - IEEE P2817 - Guide for Verification of Autonomous Systems.
  - IEEE P2840 - Standard for Responsible AI Licensing
- ANSI Grade 3 Lock standard
- BHMA Residential security Grade

Intended Users

- Home owners/tenants
- Business/commercial property owners
- Locksmiths, safe makers, security firms
- Insurance companies

Intended Uses

- Hands free locking/unlocking of dwelling, room, or safe storage