DATA PROCESSING OF PANASONIC GRIDEYE USING RASPBERRY PI 3 AND C++

ECE 3220 Software Design in C and C++

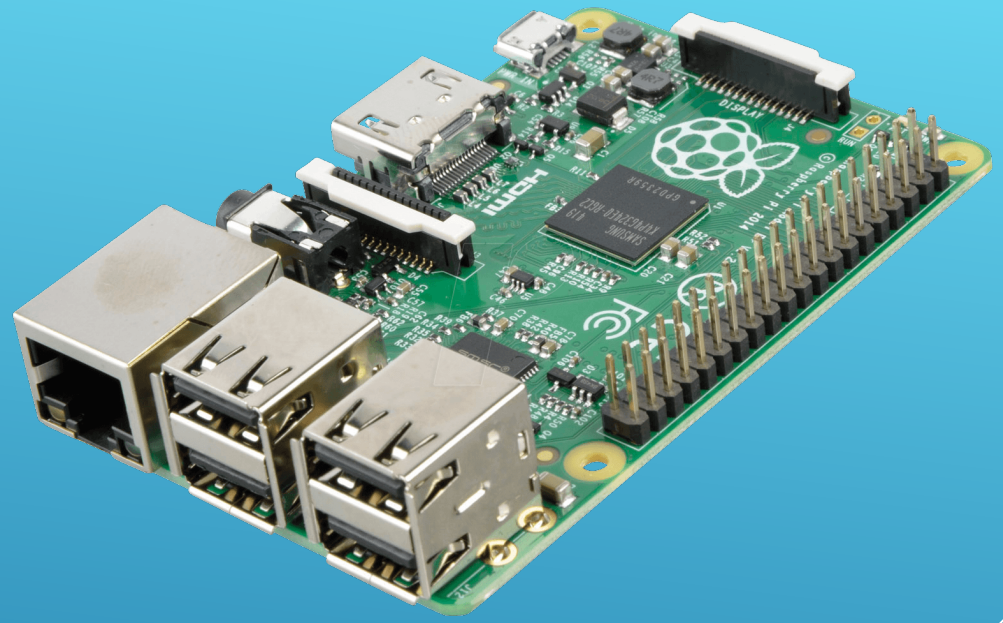
Prepared by:

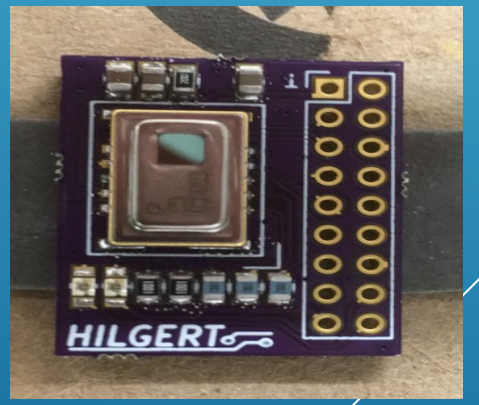
Grant Hilgert

Richard Oman

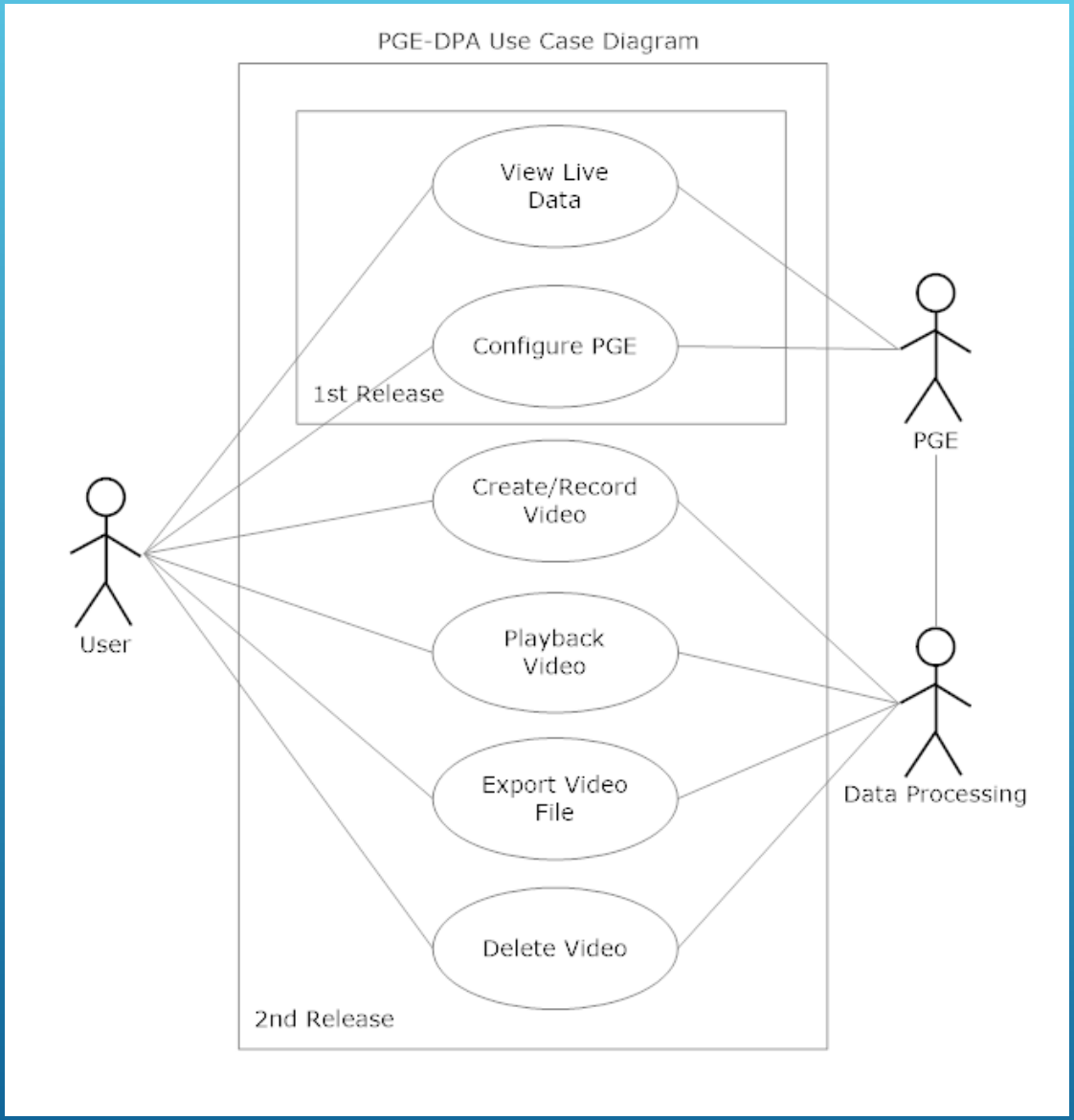
HARDWARE OVERVIEW

- Raspberry Pi-3 (RPi)
- Panasonic Grid-EYE Imaging Device (PGE)
- Panasonic Grid-EYE Data Processing Application (PGE-DPA)



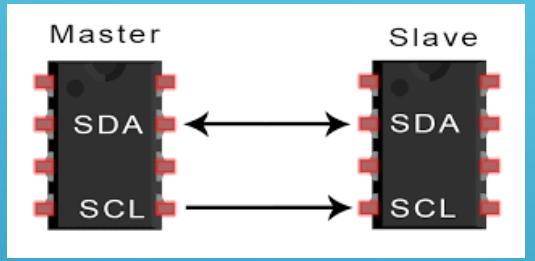


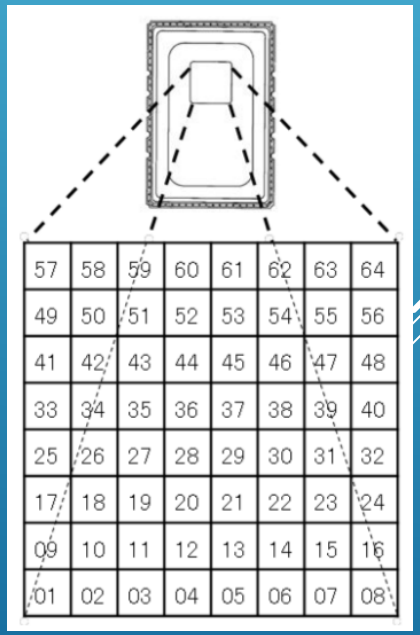
USE CASES


PGE-DPA Use Case Diagram
View Live Data
Configure PGE
1st Release
PGE
Create/Record Video
User
Playback Video
Export Video File
Data Processing
Delete Video
2nd Release

PGE & I2C

- PGE uses I2C protocol to read data from 8x8 sensor array of sensor "pixels"
- Address of PGE from i2cdetect function on RPI: 0x68
  - I2cdetect function also verifies the presence of the device while RPi is active
- Pixel Registers begin at address 0x80
  - Pixel data is 12-bits, 8 for Temperature Values, 4 for precision



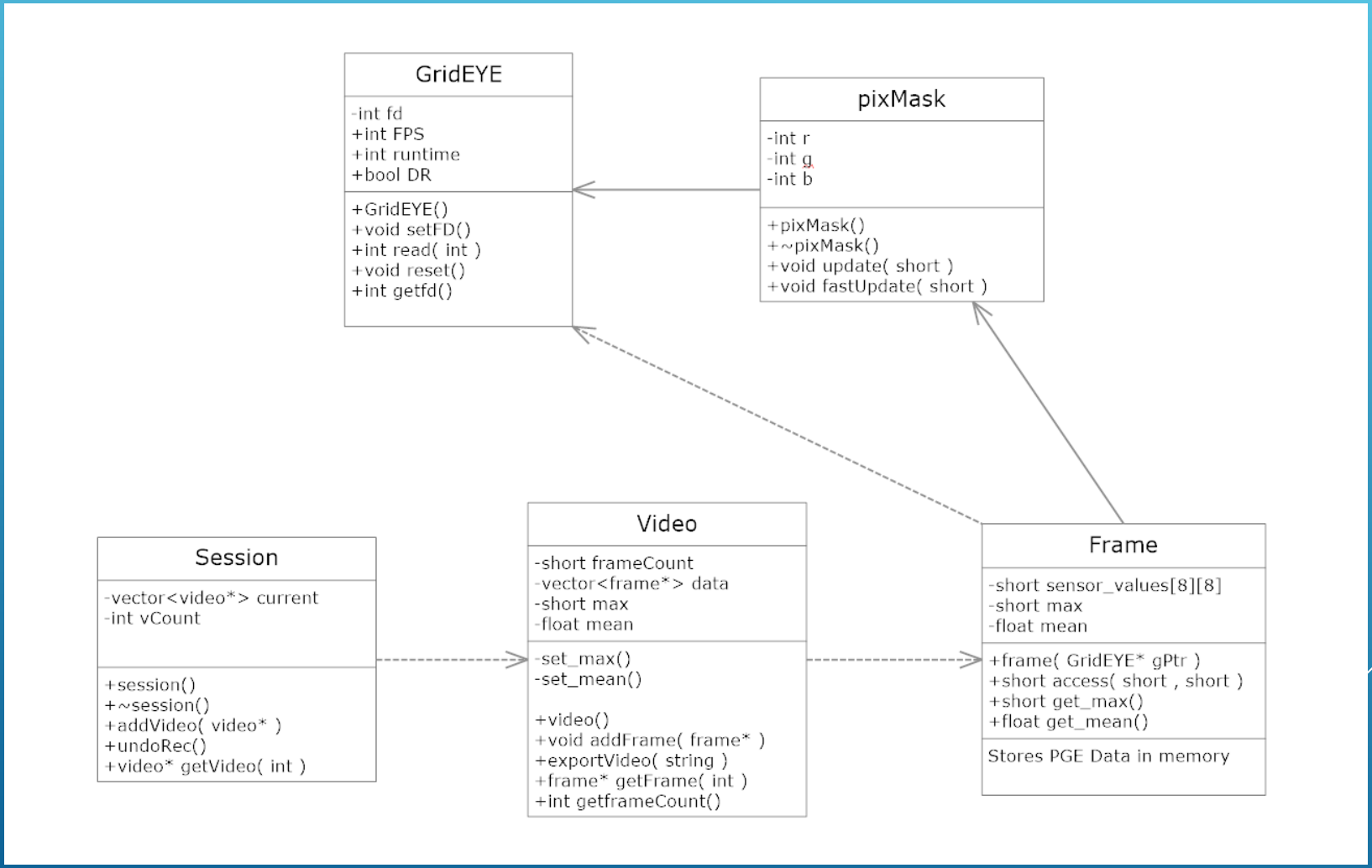


Register for reading only to indicate temperature data per 1 pixel.
Temperature Data of each pixel is 12 bit data and 2 byte data.
1 LSB has 12 bit resolution (11 bit + sign) which is equivalent to 0.25℃

SFML LIBRARY AND DEVELOPMENT PLATFORM

- SFML: Super Fast Multimedia Library
  - Graphics Library for C++
    - Allows implementation of Object-Oriented graphic objects
  - Two main sections in MAIN
    - Set up
    - While "Draw" Loop
- Developed using Xcode 9 on macOS High Sierra (10.13.1)
  - SFML Templates allow the creation of a windowed application
  - Cross-platform ability

DATA PROCESSING CLASSES



GRAPHIC CLASS DIAGRAMS