# Introduction

# Problem Definition

## System Context

## System Constraints

## Value of Multithreading

# System Requirements

## Reliability & Fault Tolerance Requirements

## Performance Requirements

## Testing Hardware

### Intel® Core™ i7-8650U CPU

### Arm® Cortex®-M4 32-bit CPU

# Conceptual Design

## Design Ethos

## Class Architecture

### UML Diagram

## Class Interactions

# Data Management

## Shared Mutable Data

## Data Flow Design

### High-Level Data Flow Diagram (DFD)

### Low-Level Data Flow Diagram (DFD)

# Lock-Free Concurrency

Description of a single module, not whole system

## Shared Data Structure

## Lock-Free Techniques

## Guarantee of Lock-Free

## Requirements of Correctness

### Safety & Liveness

### Linearization Point

## Proof of Correctness

(Mathematical proof)

# Conclusion

# References