Reliability and Security in Wellbeing Monitoring Embedded Systems

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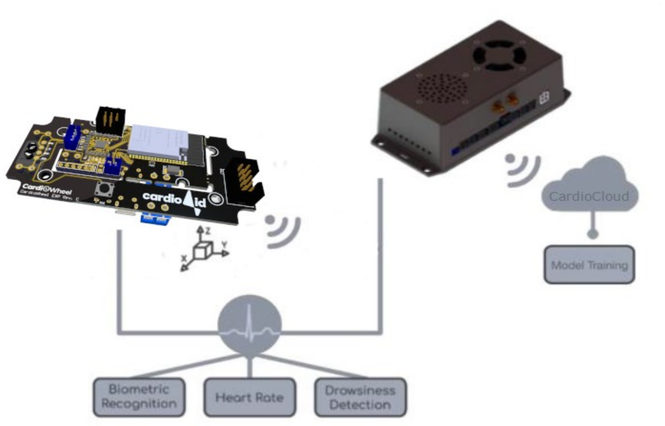
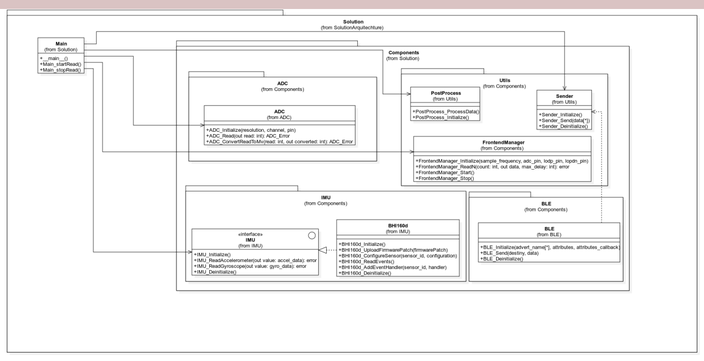
Context

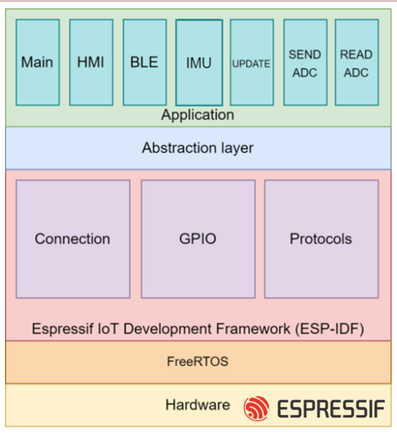


Development or architecture for Cyber-Physical end node and integration in CardioID its Ecosystem:

- Enables que acquisition of personal physiological data (ECG)
- Real-time processes the drowsiness level and biometric recognition
- The system requires to be ensure reliability and security and will follow:
  - System modularity
  - Formal architecture design
  - Formal validation

System Architecture

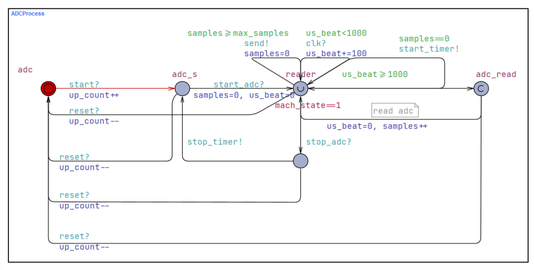


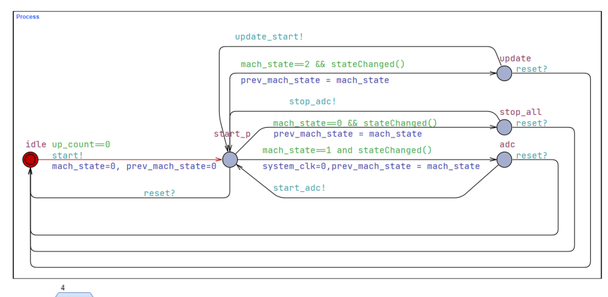


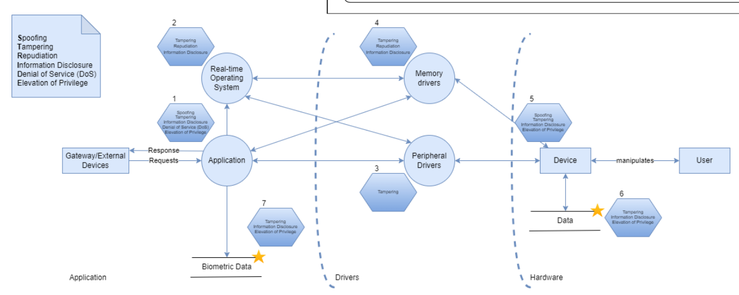
- Definition of Sequence Diagrams
- State Machines for different use cases
- Class diagrams

References

Formal Validation







- Development of formal architecture
- Study of different formal validation tools
- Threat modelling
- Defining testing heuristics

System Validation

Development of a validation system with:

- Signal injection and quality evaluation
- Hardware and BLE router validation
- Firmware installation and tracking
- HID integration:
  - Report printing
  - Touchscreen for configuration
  - Database traceability

Performance testing:

- Use case in H2020 ESCEL Valu3s project (https://valu3s.eu/)
- Accomplished all the requirements with purposed verification and validation (V&V) methods