LAFAYETTE
ELECTRICAL & COMPUTER ENGINEERING

Formula Electric Vehicle

ECE 492 - Spring 2017
VSCADA/CELL

Project Website: sites.lafayette.edu/ece492-sp17

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VSCADA Equipment

Hardware

- Raspberry Pi 3 B
- Raspberry Pi 7” Touch Display
- USB2CAN for accessing CAN interface

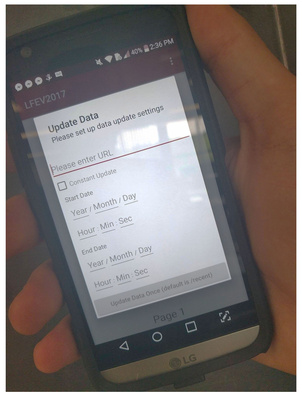
Source: goo.gl/ZOyyXn

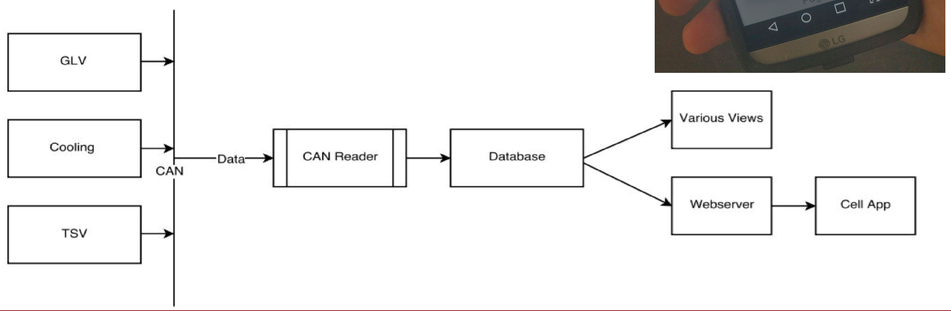
Software

- SQLite Database
- Java 8
- Java Swing
- Java Spark Webserver framework

Overview

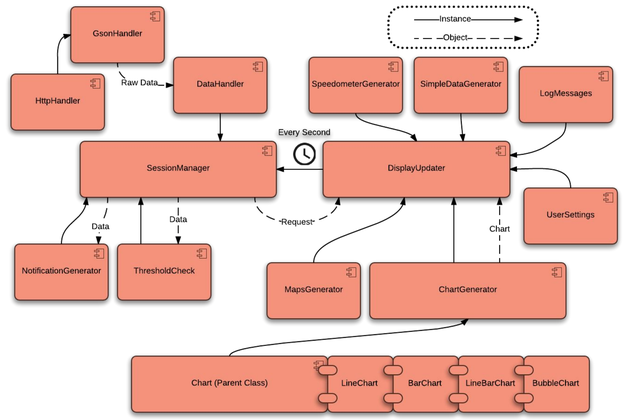
- VSCADA acts as the brains of the car
  - Acquires data from various car subsystems
  - Data is communicated over CAN interface
- Spark Webserver communicates data from SCADA to:
  - Cell Phone
  - Desktop Application





Cell App Design

- Designed with Dependency Injection principle
  - Easy to implement new views
  - Easy to implement new methods of data handling
- The main activity is divided between classes to make it more readable and manageable



VSCADA Data Acquisition

- Listens on CAN interface
- Converts raw CAN data using ID tags and puts subsystem data into database
- Query database to retrieve specific data about a subystem or from a given time
- Web server gets data from database, then pushes data to Cell App
- Local views get data directly from database

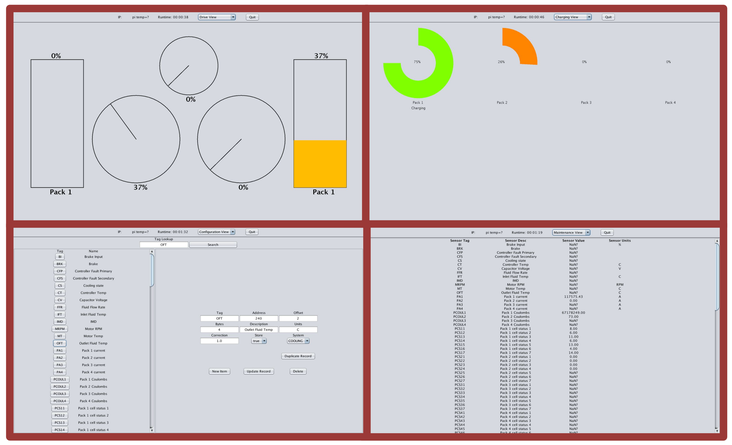
Source: goo.gl/O9R7KV

Cell App Data Acquisition

- URL provided by the user
- Converts Json and feeds into Data Handler
- Generates the available displays with the generic input
- Hashmaps are used to store the data for quick data retrieval for the generation of views

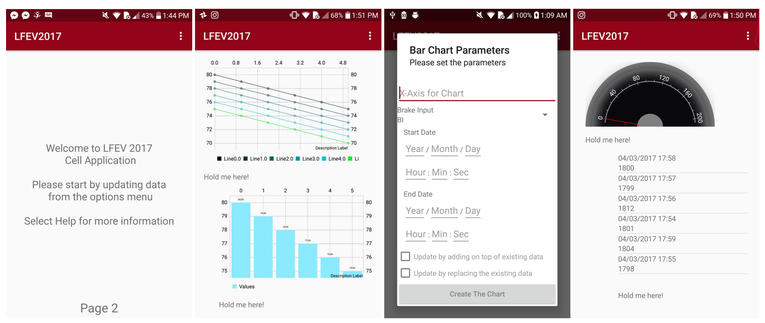
User Interface

- Drive View
- Charging View
- Maintenance View
- Configuration View



Cell App Interface

- Adding displays
- Adding pages
- Alert Dialogs
- Moveable displays
- Multiple data in chart



Cell App Interface: From left to right → Welcome Screen, Line and Bar Charts, Generation of a Chart, Gauge and Raw Data display

Cell App Equipment

- Android API 15+ (Version 4.0.3)
- Developed in Android Studio 23 with adb debugging
- MpAndroidCharts third party software

Cell App Style

- No local data storage, needs URL for data update
- Automatically updates the displays
- Fully customizable display with resizing and moving
- Simple interface

Lafayette College Sites

For more information regarding VSCADA and the Cell Application, please visit the Lafayette Formula Electric Vehicle website. Scan the QR codes below for a direct link.

VSCADA

CELL APP