DYNAMIC COLLISION AVOIDANCE

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31 October 2011

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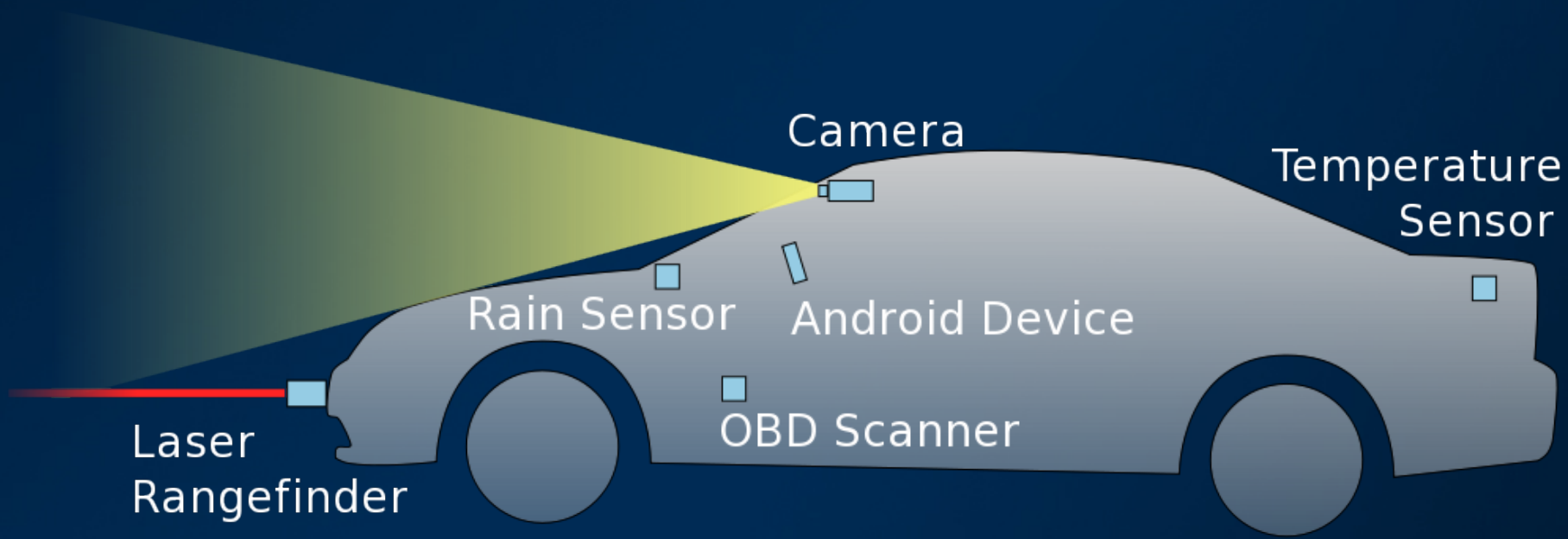
Project Overview

- System that detects impending collisions
- Designed for highways
- Determines reaction time
- Weather detection
- Real-time time headway display
- Issues warnings

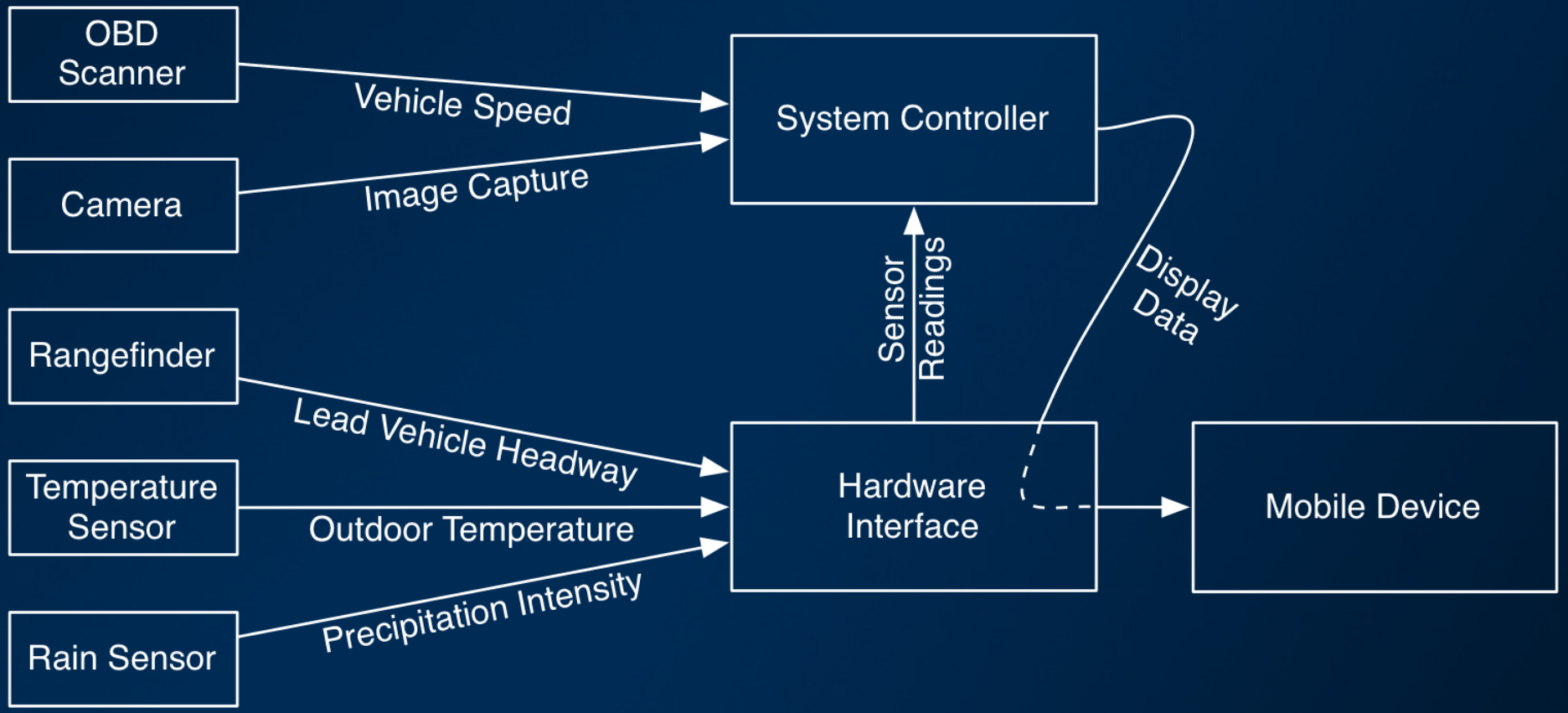
Technical Objectives

- Method of predicting impending collisions
- Auditory/visual warnings
- Weather/environmental factors
- Weatherproof enclosure to protect external parts
- Estimated cost of about $1760

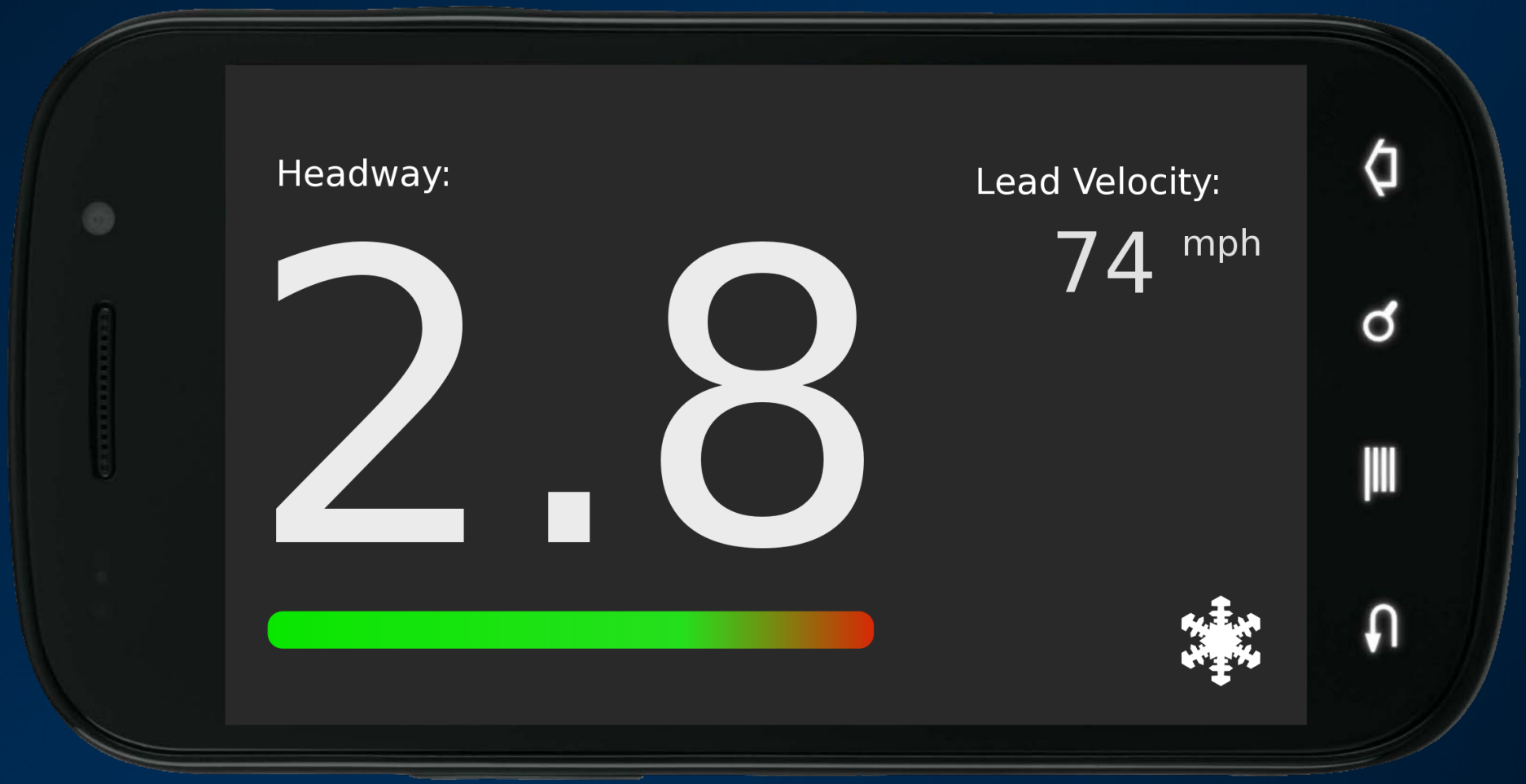
System Overview Diagram



Component Interaction



User Interaction



Problems and Limitations

- Vehicle recognition algorithm
- Android GUI development
- Occasional false readings for black-colored vehicles

Project Schedule

- Android/Arduino interfaced - 28 Sept
- Temp, Humidity Sensors Online - 11 Oct
- Laser Range Finder Operational - 13 Oct
- OBD\Laptop Interfaced - 20 Oct
- Android GUI complete - 26 Oct

Budget

Prototype Parts	Unit Cost
Arduino Mega ADK	$85
Laser Rangefinder	$320
Rain Sensor	$90
Total	$495

Delivery Status: Arrived

Current Status

- Laser Rangefinder
  - Completed
- Android Phone
  - GUI completed
  - Receives data from Arduino
- OBD Scanner
  - Vehicle speed obtainable
- Temperature Sensor
  - Measurements can be obtained
- Computer vision
  - Crude lane detection algorithm completed
  - Training data for vehicle detection gathered

Future Work

Task	Date
Implementation of auditory alerts	5 Nov
Mounting of rangefinder on vehicle	5 Nov
Interpretation of temperature, humidity and precipitation data	10 Nov
System Logic for calculating headway and giving warning	14 Nov
Interfacing with rain sensor	20 Nov
Vehicle Detection and tracking algorithms	25 Nov

Questions

- 26.5% of all motor accidents are front-to-rear crashes
- Such accidents accounts for 4.3% of traffic-related fatalities
- Accounts for 1/3 of all crash-caused delays
- Results in 157 million vehicle-hours of delay annually
- 64% of such crashes are a result of driver inattention