Design
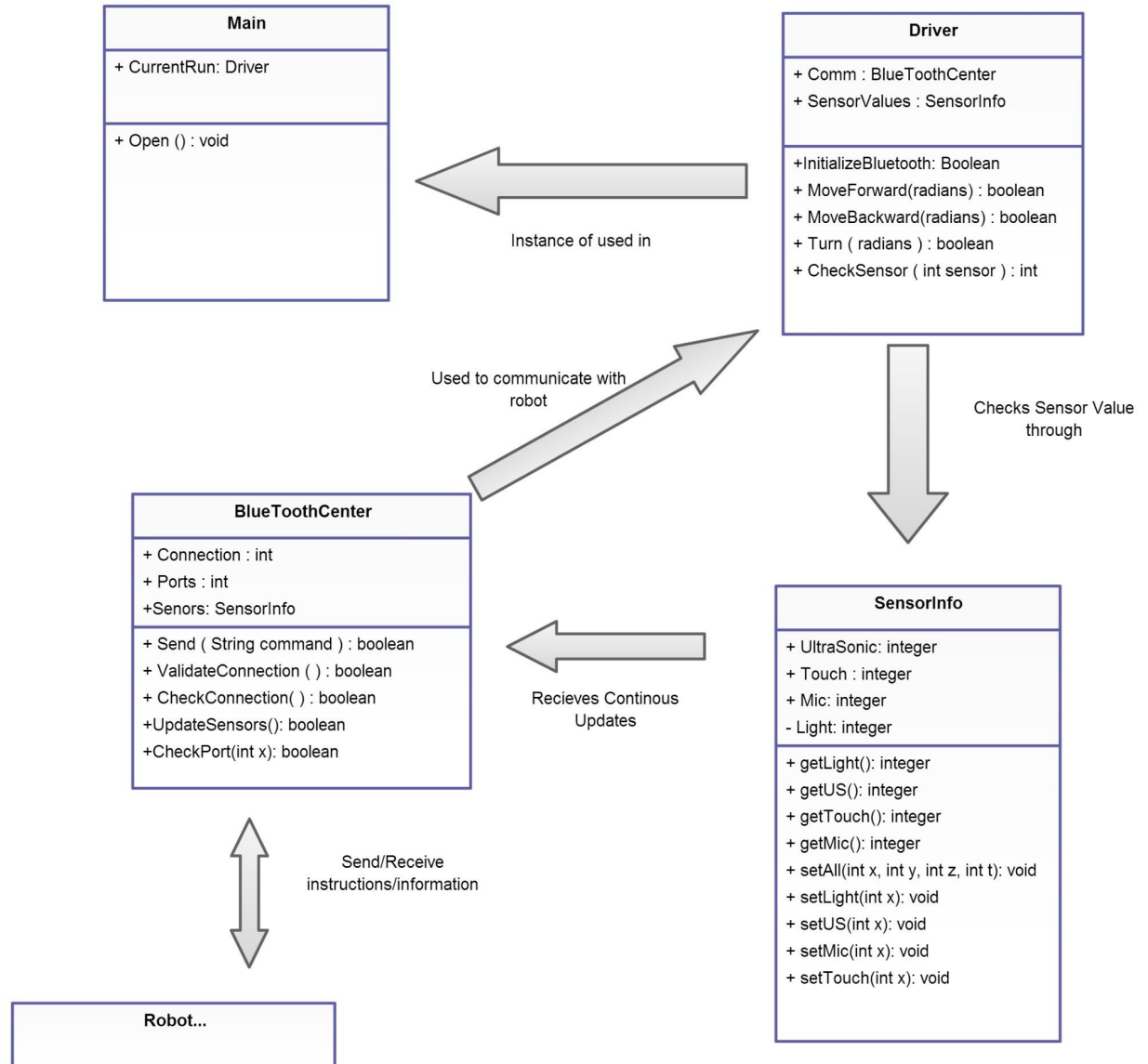
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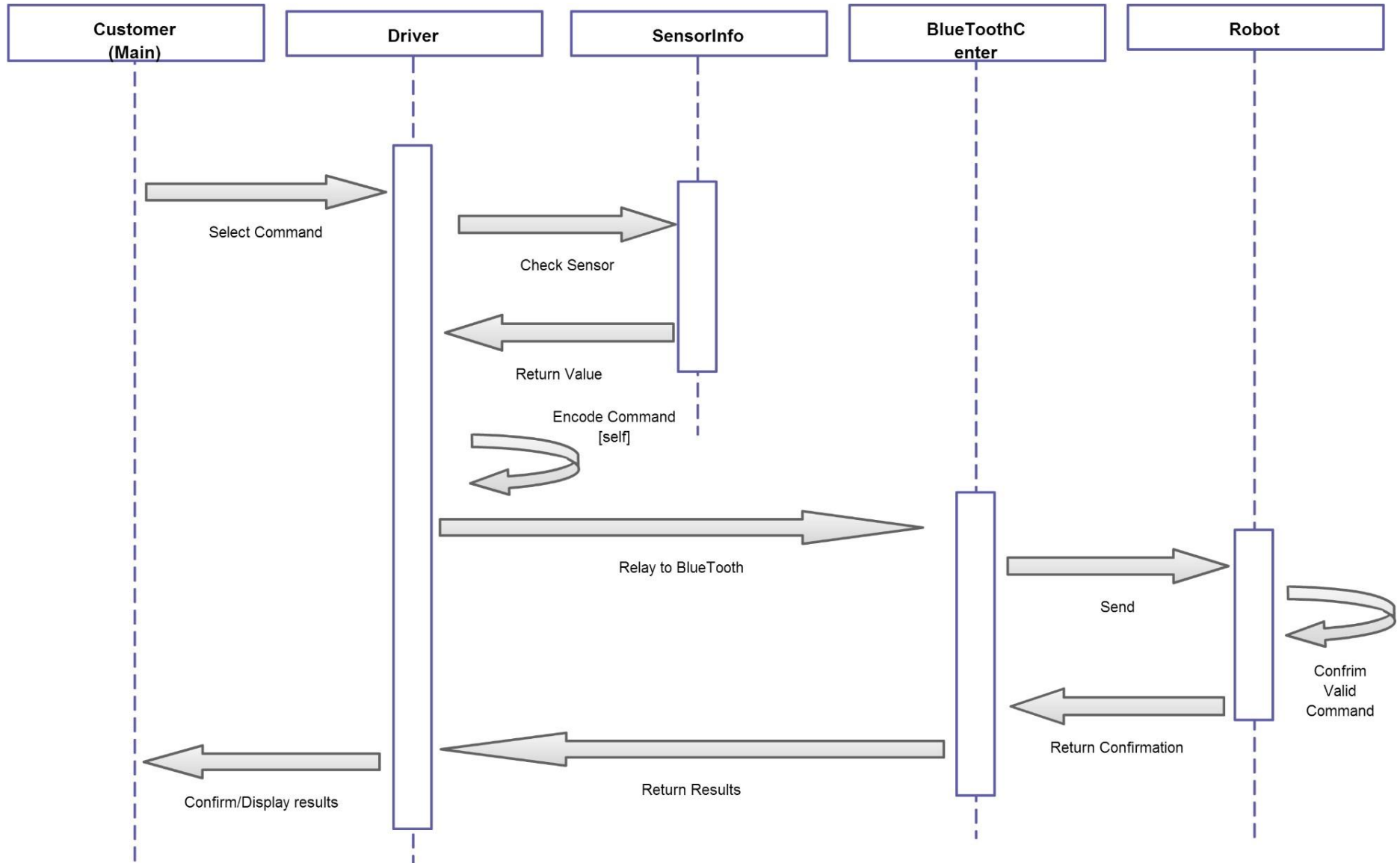
Overview of Design

- Main/UI (BaseStation) function that initializes all classes/objects and establishes bluetooth connection with robot (using Bluetooth object)

- Bluetooth object waits for messages/information concurrently from robot

- Driver converts UI input for movement into a readable command by the robot and sends it to Bluetooth

- Sensor does the same for telemetry data as Driver in addition to receiving telemetry data from robot and converting it into a form the UI can handle

UML

Main

+ CurrentRun: Driver

+ Open () : void

Driver

+ Comm : BlueToothCenter
+ SensorValues : SensorInfo

+InitializeBluetooth: Boolean
+ MoveForward(radians) : boolean
+ MoveBackward(radians) : boolean
+ Turn (radians) : boolean
+ CheckSensor (int sensor) : int

Instance of used in

Used to communicate with robot

Checks Sensor Value through

BlueToothCenter

+ Connection : int
+ Ports : int
+Senors: SensorInfo

+ Send (String command) : boolean
+ ValidateConnection ( ) : boolean
+ CheckConnection( ) : boolean
+UpdateSensors(): boolean
+CheckPort(int x): boolean

Recieves Continous Updates

SensorInfo

+ UltraSonic: integer
+ Touch : integer
+ Mic: integer
- Light: integer

+ getLight(): integer
+ getUS(): integer
+ getTouch(): integer
+ getMic(): integer
+ setAll(int x, int y, int z, int t): void
+ setLight(int x): void
+ setUS(int x): void
+ setMic(int x): void
+ setTouch(int x): void

Send/Receive instructions/information

Robot...

BaseStation

- Runs the UI

- Takes in input from the user through the UI and passes it through the driver class to make it readable by the robot. Which then passes it to the bluetooth and sends it to the robot.

- Displays telemetry data as received by bluetooth -> sensor classes.

Driver

- Takes information from BaseStation, converts it to readable command for robot as specified by communications document, and sends that command to Bluetooth
- Also receives information from Bluetooth to send to BaseStation to display to user
- Has setters and a translation method to decipher information from robot

Sensor

- Generic class that represents each and holds the requirement for each sensor
- Bluetooth, Microphone, Ultrasonic, Touch, Light will be subclasses of this class in future
- Has basic getter and setter methods for sensor values
- Each subclass has a specific range of values that each sensor can obtain

Bluetooth

- Handles all communications between the BaseStation and the on-board robot software

- Sends commands via the built-in bluetooth connection to the robot and receives commands from the robot

- Interprets information from the on-board robot software and transmits the information to the correct class based on the prefix. (err to basestation, sensor to sensors, speed to driver to basestation)

Potential Changes

- Improve specificity in UML diagrams to better illustrate relationship between classes as well as more defined prototypes.
- Create more clearer function names to better illustrate the functions purpose.

Management Report

- Met once before the break
- Synthesized schedules for spring break and discussed preliminary ideas during first meeting
- Second meeting was used to finalize deliverables for post-lab 4 and pre-lab 5 presentation
- Next meeting is regular Monday afternoon meeting