iRobot Create Remote navigation

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Objectives Overview

- Create a semi-automatic navigation system for iRobot Create

- **Manual Navigation**
  - Move action
  - Rotate actions (Left and Right)

- **Automatic Navigation**
  - Robot override bad users commands (e.g. stop moving into a cliff)

Approach

- **Waterfall Model**
  - Simple project
  - Fixed objectives

- **Weekly milestones**
  - Six milestones (goals and deliverables)

- **Statechart design versus Block Diagrams**

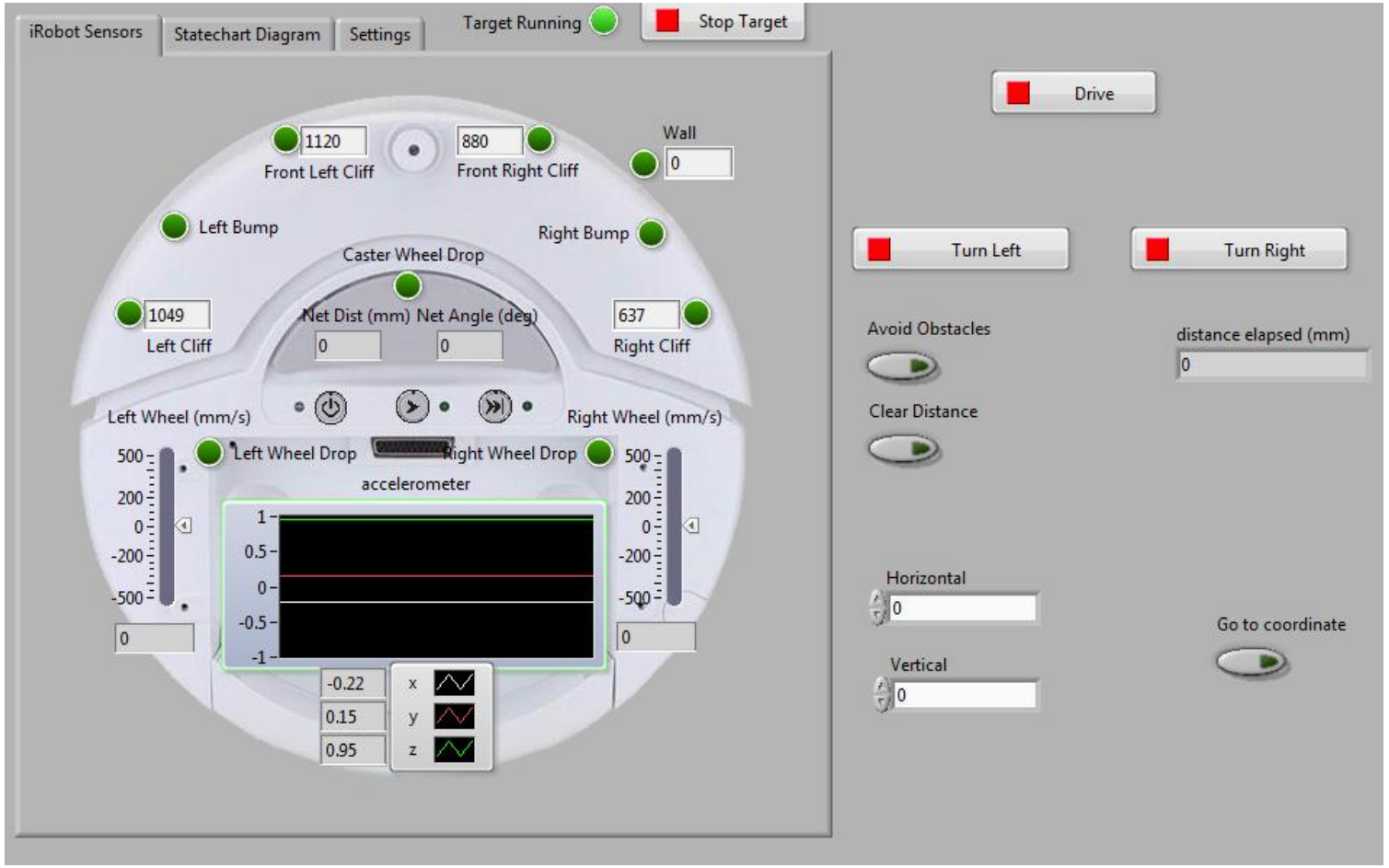
Objectives Details

- Create communication protocol
- Remote connection to the iRobot Create
- Robot helping the user during navigation
- Robot communicate autonomous decisions to the user

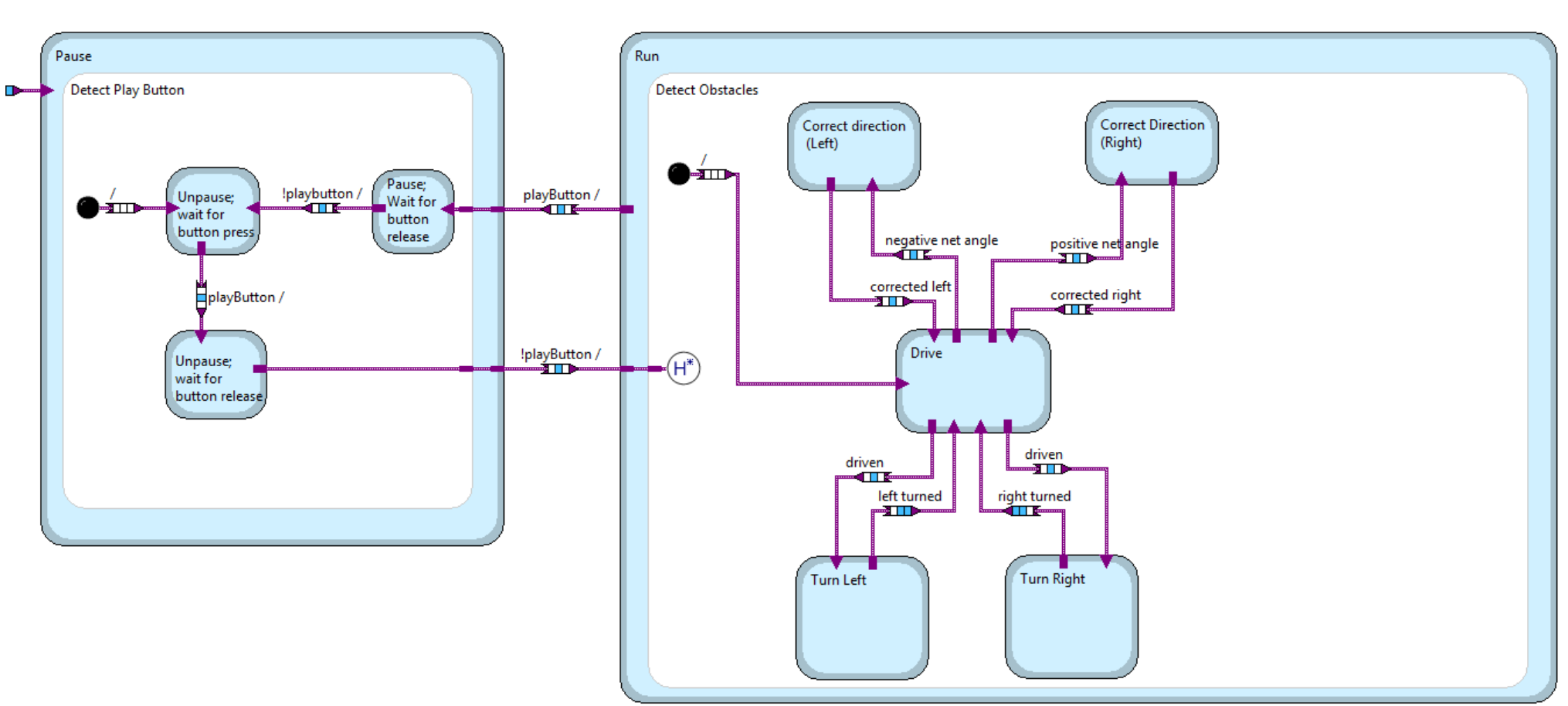
Implementation

- **Robot**
  - iRobot Create
  - NI myRIO FPGA
- **Development Environment**
  - LabVIEW 2013
- **Network**
  - LAN

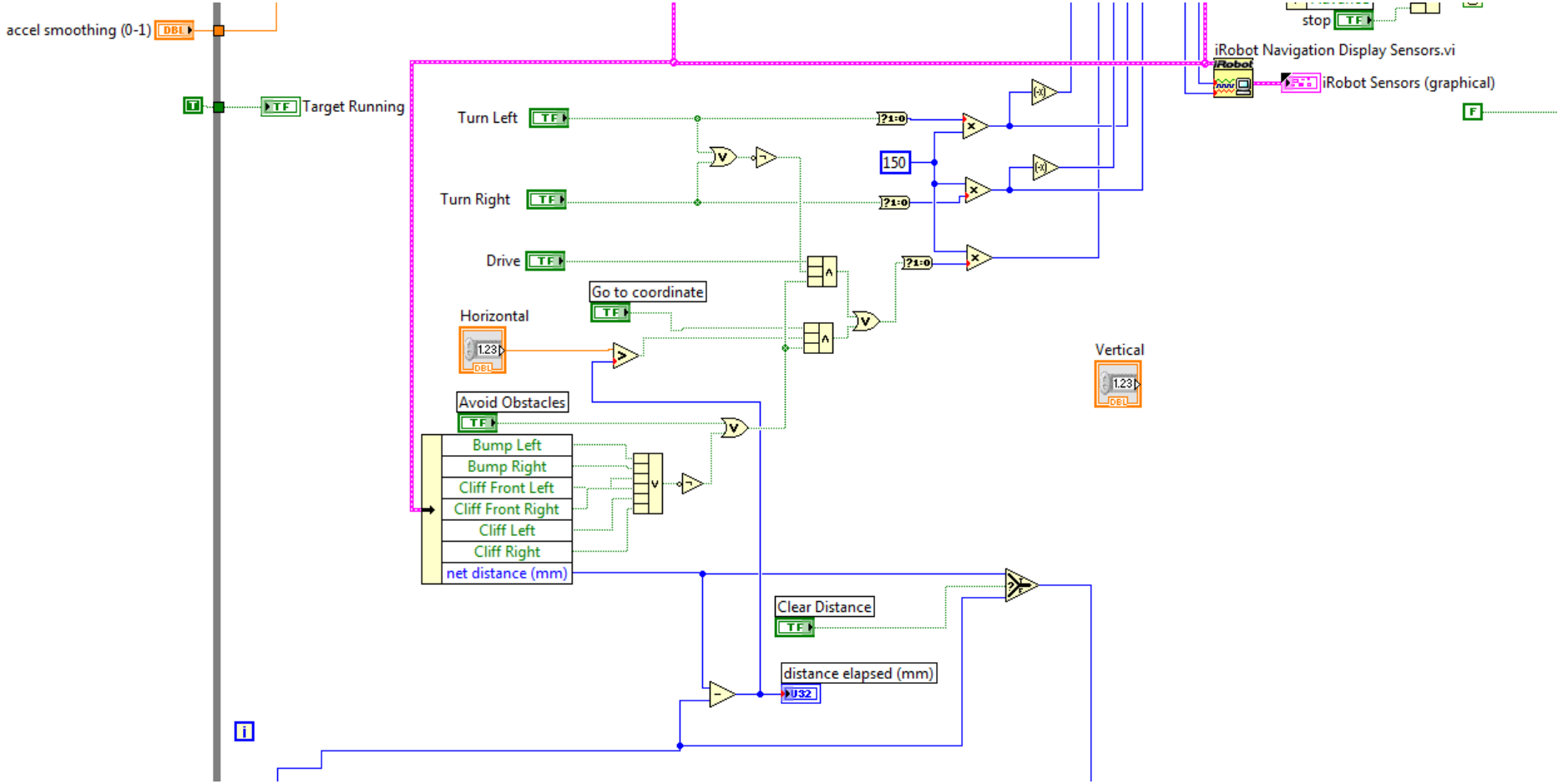
Implementation



Implementation



Implementation



Challenges

- **Wireless network (SOLVED)**
  - NYU network is unfriendly for embedded devices
- **Blending Statechart and block diagrams control (PENDING)**
  - Controlling the robot from both ends (BAD IDEA)
- **Global shared variables (SOLVED)**
  - Registers

DEMO

{{Moment of truth}}