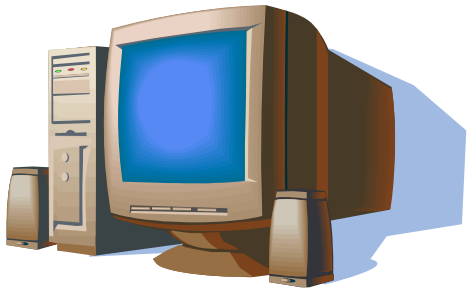
A Presentation by Daniel Fenton

An Analysis of Past Systems at the IGVC

Overview

- What is the IGVC?
- Typical Setups
- Renegade Designs
- What does it all mean?
- Q & A



What is the IGVC?

- The Intelligent Ground Vehicle Competition is held every year at Oakland University in Rochester, Michigan.
- Colleges and Universities from around the world attend to compete in two major events; the Autonomous Challenge and the Navigation Challenge.

Oakland UNIVERSITY

HOSEI Hosei University

ÉCOLE POLYTECHNIQUE MONTRÉAL

University of Waterloo

The Autonomous Challenge

- In the 2008 IGVC, the Autonomous Challenge was made up of 575 feet of winding path.

- Interspersed with obstacles such as street cones, ramps, and a S-Turn.

- Given start and end GPS waypoints.

The Navigation Challenge

- In 2008, given 9 GPS waypoints.

- Must navigate to each avoiding obstacles such as orange fences and cones.

Typical Setups

Images courtesy Bluefield State College

Renegade Setups

Articulating Bodies

University of Detroit Mercy – Thor (3rd 2006)

Virginia Tech – Gemini (1st 2006)

Multi-sensor Vision Systems

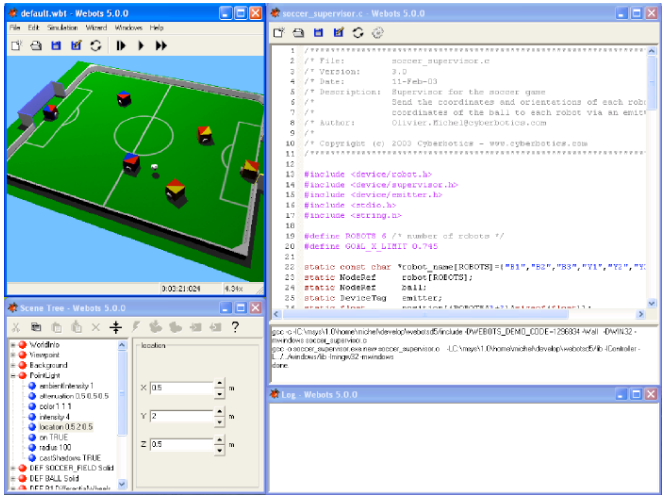
Virginia Tech – Chimera (5th 2006)

- Uses two cameras and deactivates LRF for obstacle navigation.

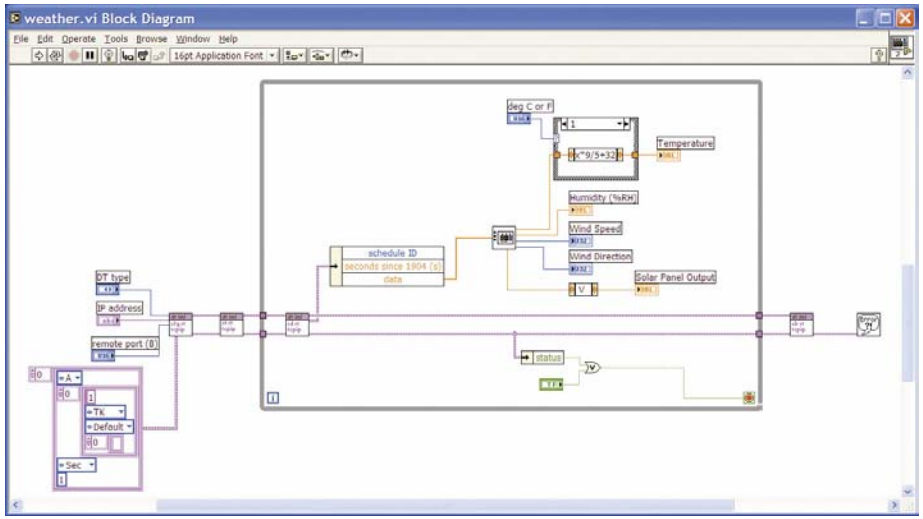
- Reaction time is slower: 120 ms total versus 68.1 ms for Gemini (From team design reports)

Software

- **Ceratops (1st 2008) –** Player/Stage (open-source, Unix-based (Linux or Mac OS X))
- **Johnny-5 (1st 2007) –** NI LabVIEW 8.2
- **Amigo 2004 (2nd 2004) –** Mathworks MATLAB



Player/Stage Code



NI LabVIEW code

What does it all mean?

- Typical Setups are typical for a reason
- Different setups breed new ideas
- Also breed myriad of technical hurdles
- Only way to move forward is over the hurdles

References, Contact

- All photographs and images are copyright by their respective owners.
- Most of the information may be found at the IGVC website: www.igvc.org

- My contact information:

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