GROUP 7 -- Project 3

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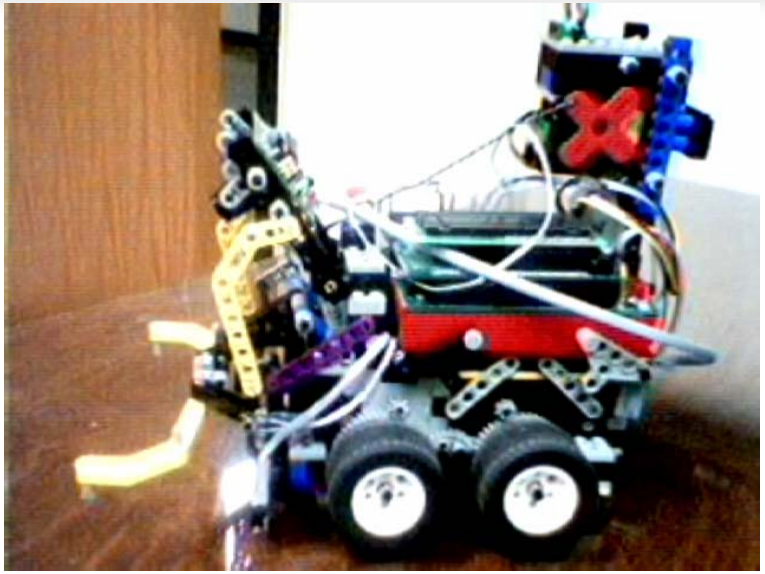
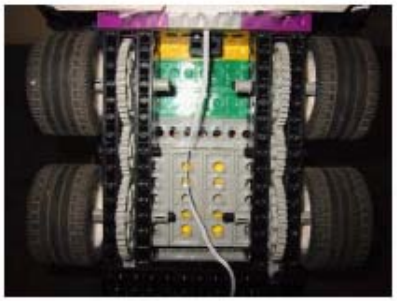


Intro

- Hardware
- Software

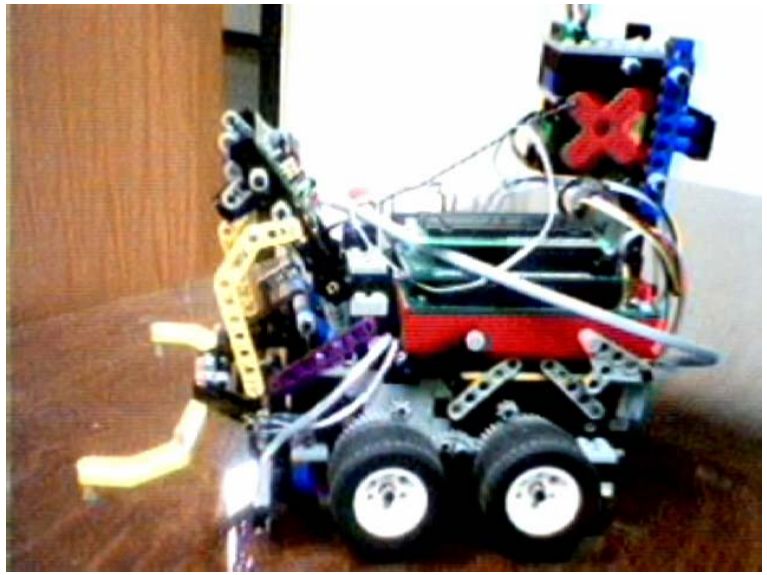
Hardware

- Motors and gearing
  - **4-wheel-drive**
  - **Two motors**



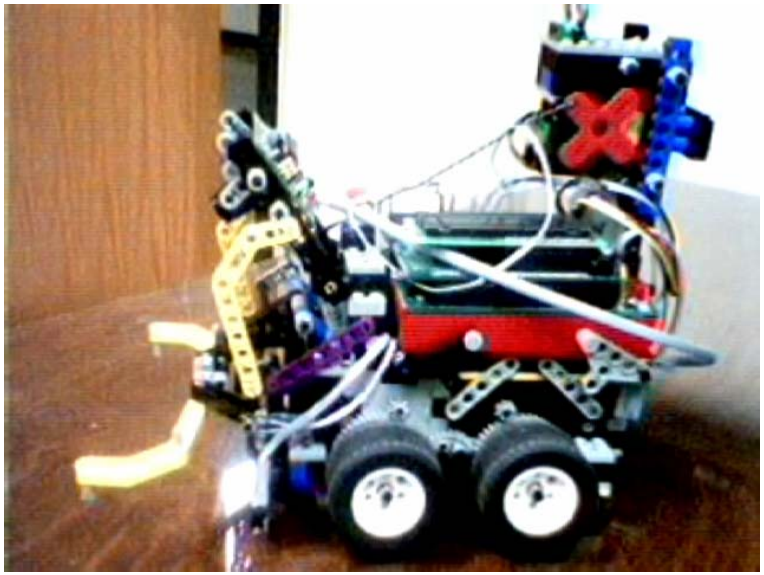
Hardware cont.

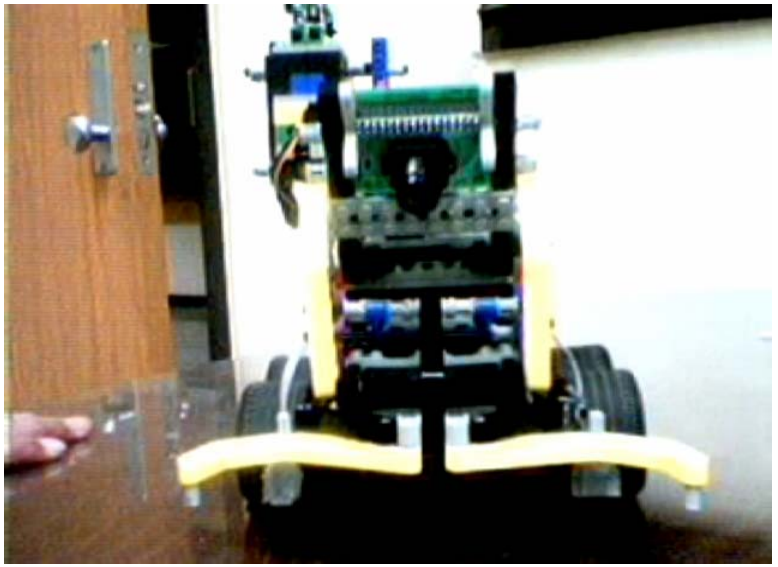
- **Sensors**
  - **CMU-cam**
  - **Shaft encoders**



Hardware cont.

- **The Claw-Grabber**





Software

- Simple Finite State Machine
  - Easy to add modules
- Modules
  - Path Planner
  - Path Executor
  - Find Block
  - Has Block

Software Cont.

- World Model
  - Array of coordinates
    - Block
    - Goal
    - Robot
  - Robot coordinates updated as it moves through the world.
  - Used to find closest goal and plan a path.

Software Cont.

- Path Planning.
  - Find the shortest goal (Block / Goal)
  - Move plus/minus x positions to line up with goal on the same plane.
  - Move plus/minus y positions to goal.
  - Allowed for just 1 90 degree turn
    - Minimized turning error.

Software Cont.

- Plan Executor.
  - Array of commands
    - Straight, Turn Right, Turn Left, Stop, End
  - Combines many straight commands into 1 command for specified distance.
  - Robot evaluates position and re-plans if not to destination.

Software Conclusion.

- Software was a success when it came to the world model / path planning / execution.
- Shortfall was the accuracy of the turns and correcting for turning error. Needed more resolution for shaft encoders (currently had 10 ticks per inch).