



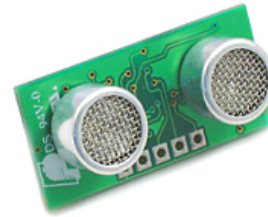
Sensor Report

08/05/07

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Special Sensors

- Devantech SRF10



- D-Link DCS900

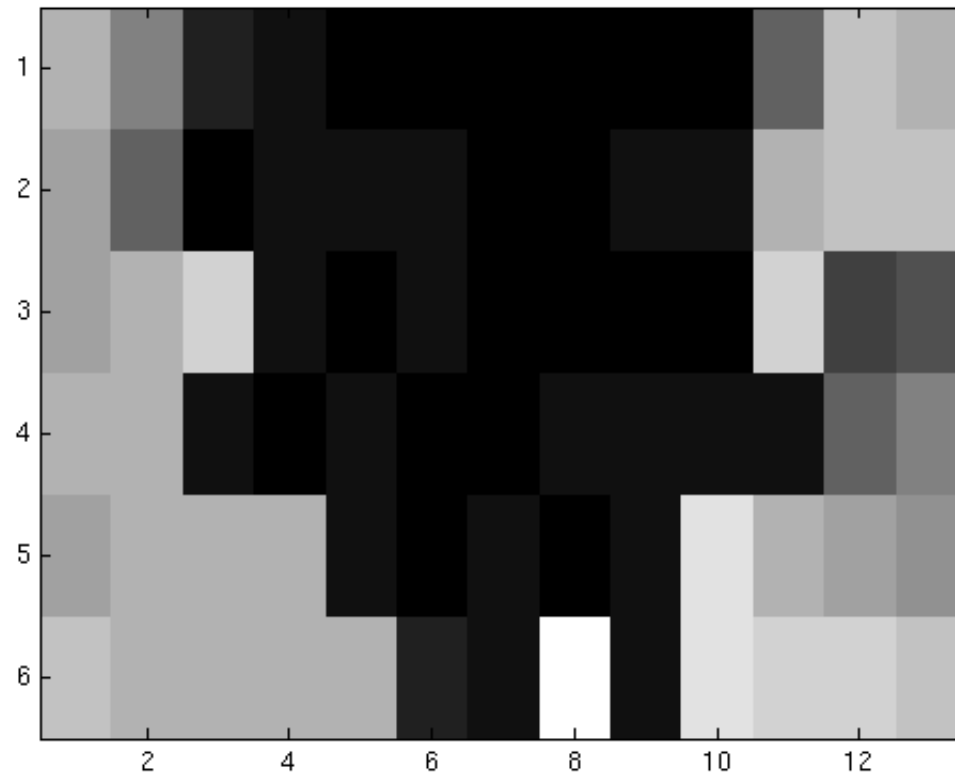


SRF10 Sonar Range Finder

- Pros
 - Immunity to sunlight
 - Distance (supposedly up to 6m, testing successful up to around 12')
 - I²C (chain-able sensors)
- Cons
 - Pricy
 - Spread sensitivity
 - “Wacky” sensitivity to some situations
 - Edges
 - Smooth surfaces

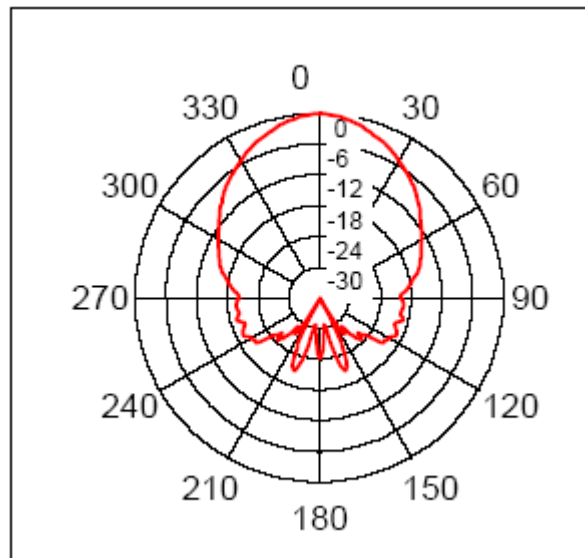
Experiment

- Test the spread of the sensor



Experiment

- Manufacturer's plot for directional power



Future plans for SRF10

- Experiment with shrouding to direct sensitivity
- Two-layer configuration for differentiating between goal (block) and obstacle (other robot, human leg, wall)
 - Main sensors will be SRF10's while secondary layer will likely be SRF5's

DCS900

- Pros
 - MJPEG Stream
 - Single JPEG grab available
 - Rapid access to raw image
 - Auto-adjustment to lighting conditions
- Cons
 - JPEG decompression
 - Approx $\frac{1}{4}$ second lag
 - Network complexity

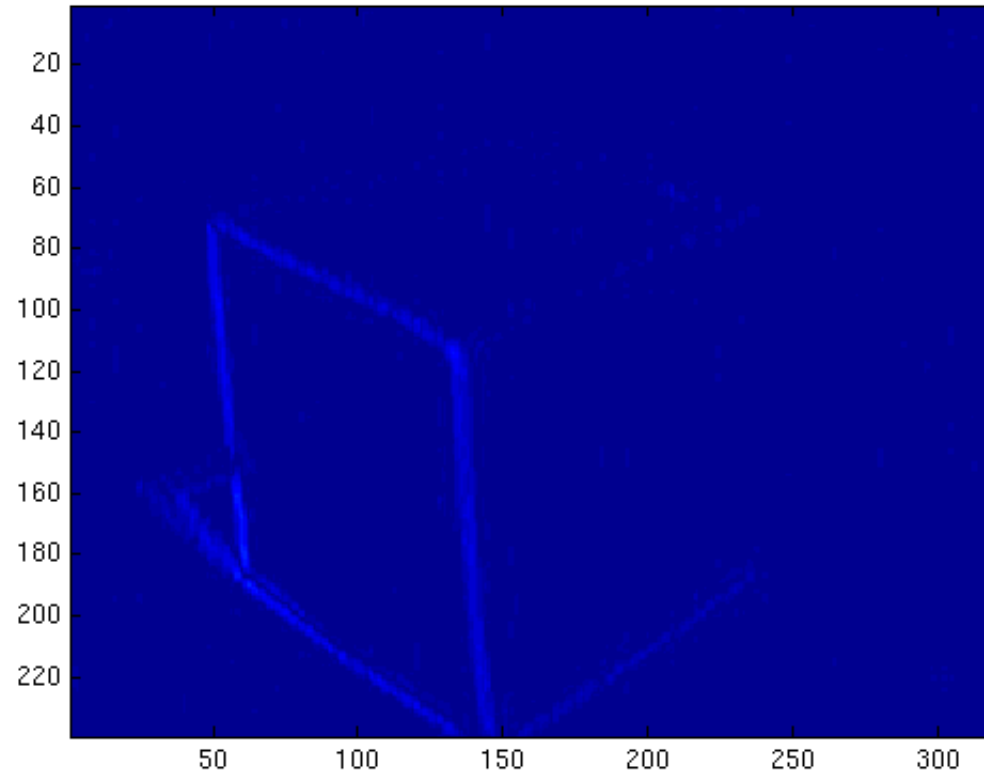
Tricky problem: same-colored block and background

- White block on a white background

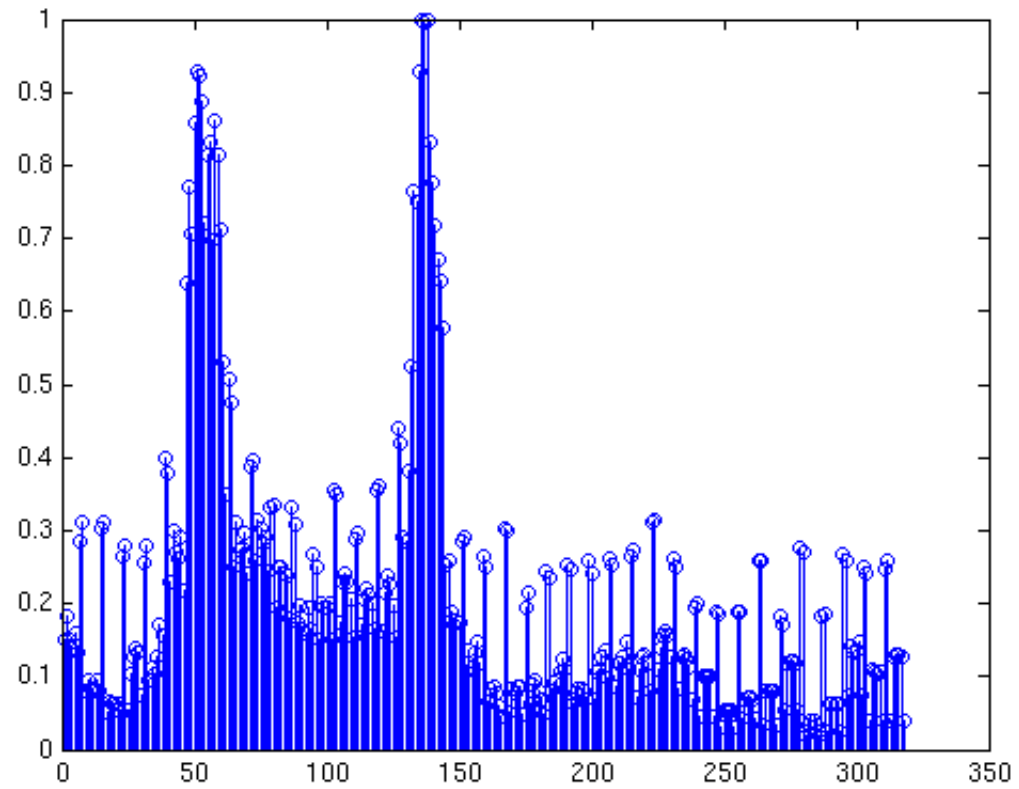


Possible solution: detect edges

- Simple vertical-only Sobel



Histogram to “find” heavy edges



Future Work for DCS900

- Investigate other lightweight filters to ferret out edges
- Investigate multiple simultaneous lightweight filters
 - Voting system
 - Detect situation (same-colored, contrasting colored) and determine best filter for the job
- Fine-tune consumer/producer model used for grabbing images