Infrared Sensor Simulation
with Breve

Marc Waldenberger
The real sensor

- TEFT4300
- High radiant sensitivity
- Wide viewing angle ±30°
- Fast response times

Vishay.com datasheet
Sensor approximation

- Array of rays
- Intersection of rays and obstacles
- Apply sensor specific functions
- Sum all resulting ray values
Factors influencing the signal

- Reflecting area
- Distance
- Angle of incidence
- Angular displacement
- Environment

- Surface
  - Color
  - Material
Intersection of rays and obstacles

- For each plane of the shape
- For each ray
- Calculate intersection point
- Test if the point is inside the face
Angle of incidence

- Diffuse fraction
- Specular fraction
Distance

- Signal weakens over the distance
- Linear approximation

IRSensor Simulation with Breve

Marc Waldenberger, 7
Angular displacement

Sensor sensitivity changes with the angle between the ray and the central sensor line.

Figure 9. Relative Radiant Sensitivity vs. Angular Displacement
Indiscernible distance

- Central line but in a large distance
- Or small distance but displaced from the central line
Communication

- Robots can „see“ each other
- Sensor in the appropriate direction

Quality
- Distance
- Angular displacement
- Other signals
Speedup

- Bounding boxes
- Objects behind the sensor are ignored
- Maybe you have some good ideas