Proactive Mobile Obstacle Avoidance System used by the Service Robot InBOT

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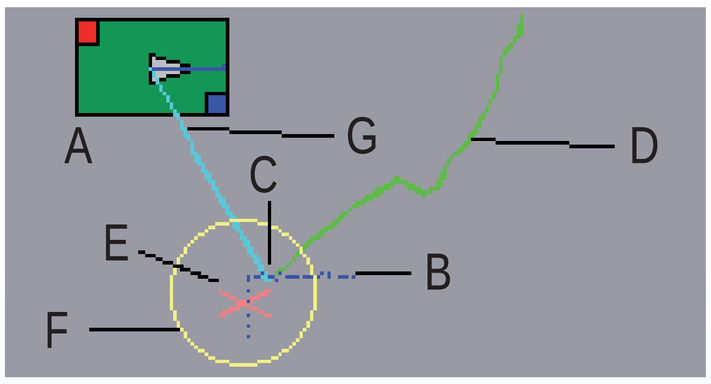
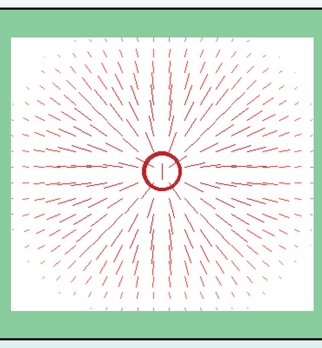
inbot
Interactive Behaviour Operated Trolley

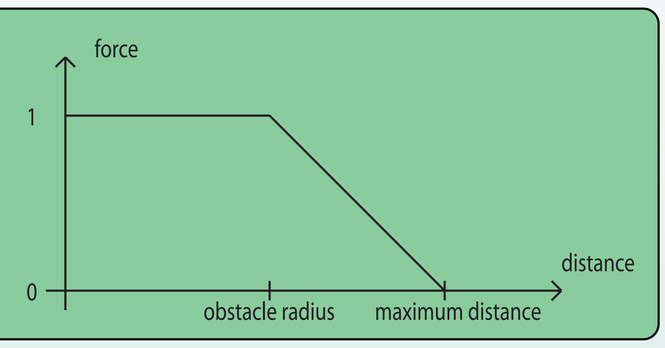
- Detection of dynamic Obstacles in an Occupancy Grid based on Laserscanner Range Data



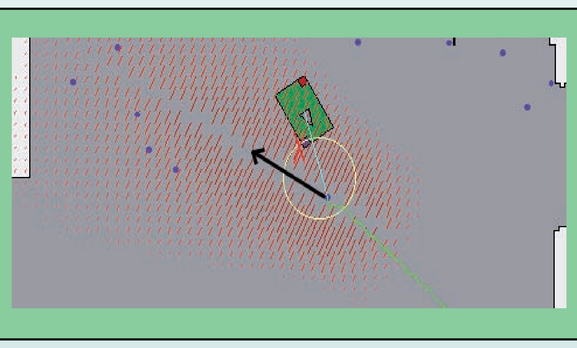
- Layered Proactive Mobile Obstacle Avoidance System

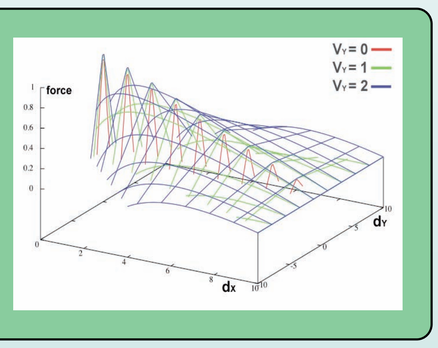
  - Escape Reflex
    - Force field around obstacles repels robot



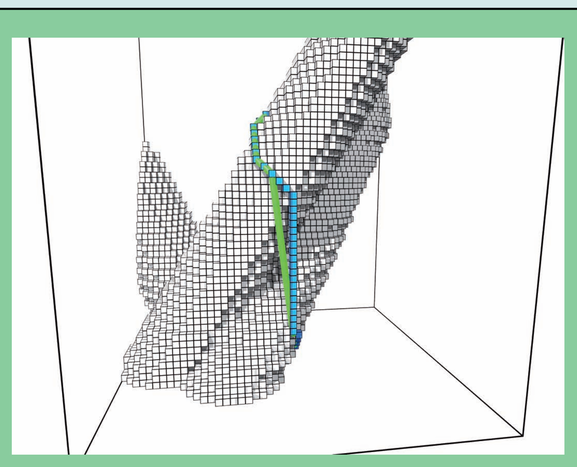


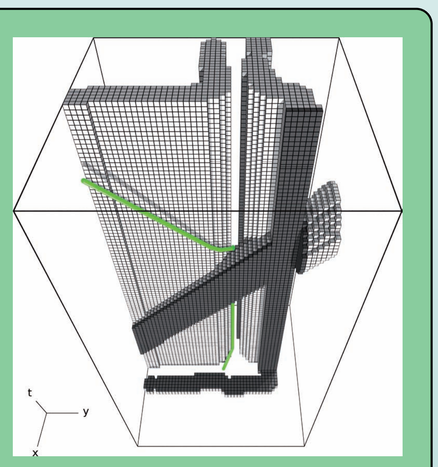
  - Evade Reflex
    - Force field around predicted path moves robot out of the way

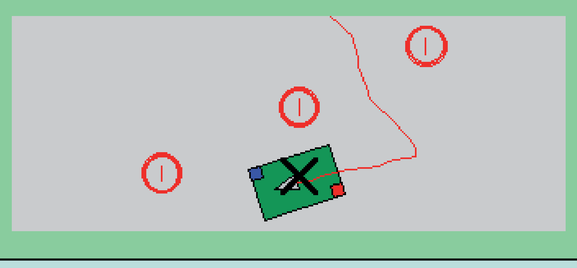


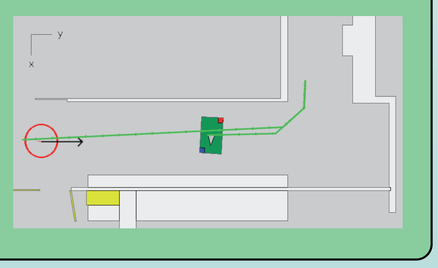


  - Proactive Planner
    - Planning in 3D (x-y-time) predicted occupancy space
    - Avoiding bad predicted robot positions
    - Planning is slow, robot is kept safe by the faster layers









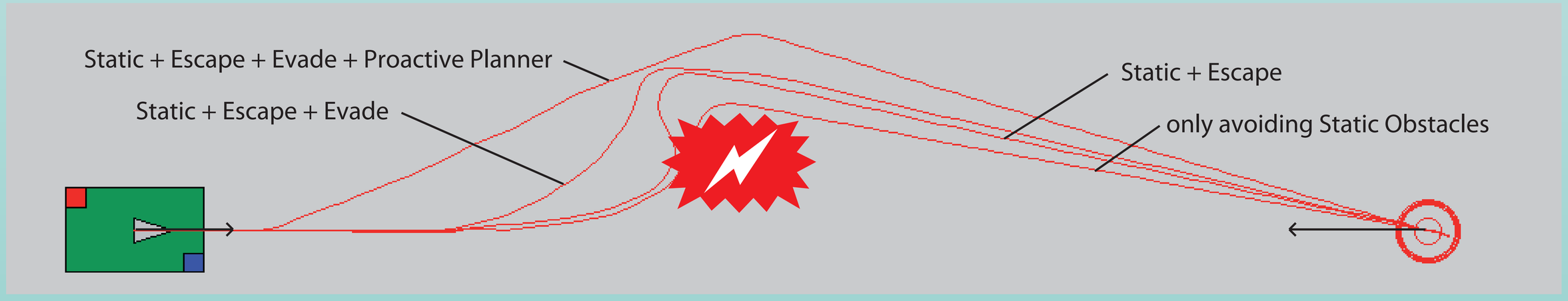
fast — reactive

Reaction Time

Action Generation

slow — deliberative

- Increasing Distance by adding the Avoidance Layers to the Robot Control



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