



LOGION - A ROBOT WHICH COLLECTS ROCKS

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INTRODUCTION



- MART Robotic Team
- Design of robot Logion



AGENDA



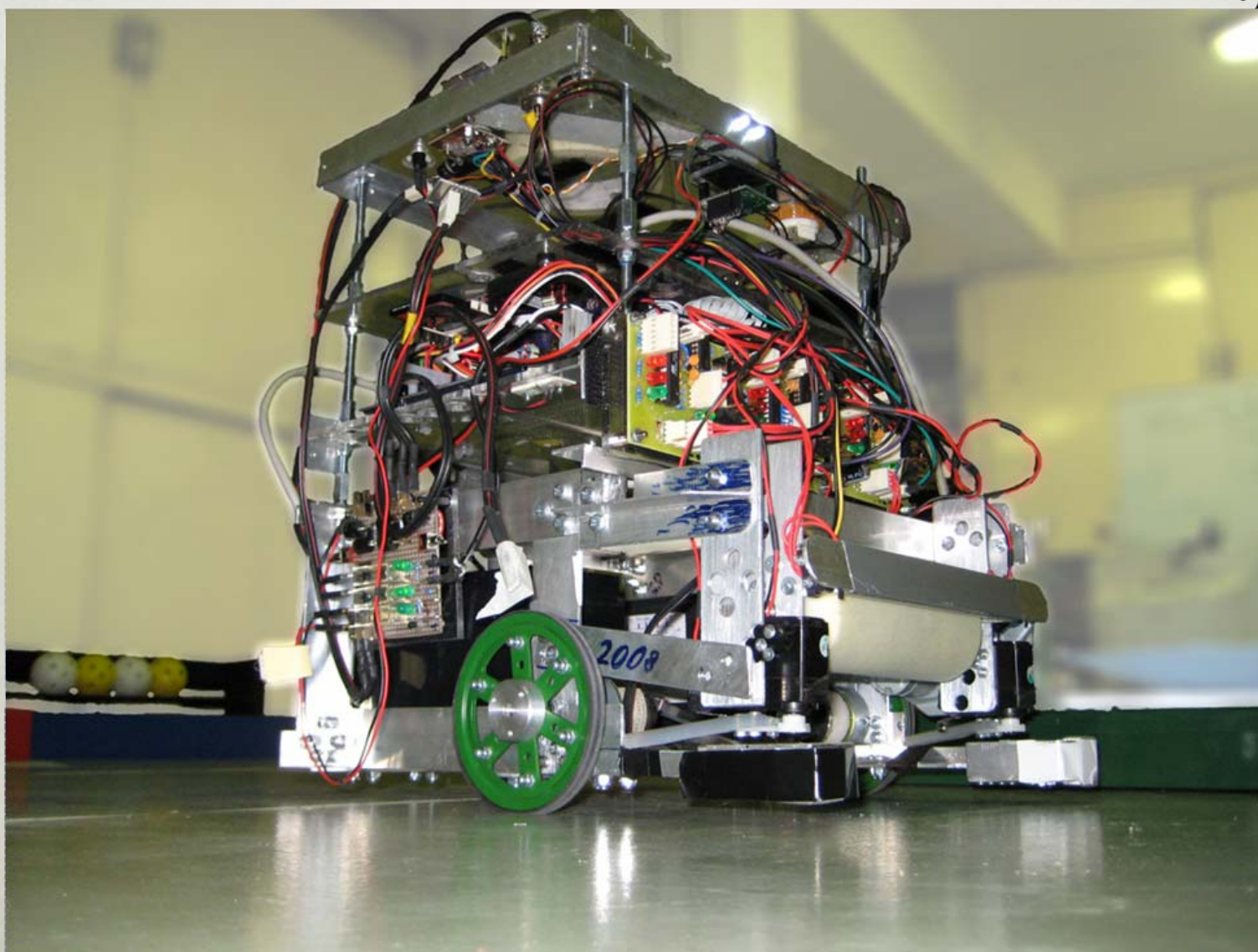
- Design overview
- Software design and algorithms
- Brain
- Localization
- Moving
- Opponent avoidance

DESIGN OVERVIEW



- PC Motherboard
- Hardware modules (MCU with sensors and actuator drivers)
- infrared + ultrasonic localization
- Power source: Sealed Pb accumulators
- Motors with integrated gearbox 50:1 + encoders (6000 steps per wheel revolution)
- max speed ~ 0.7 m/s
- compass

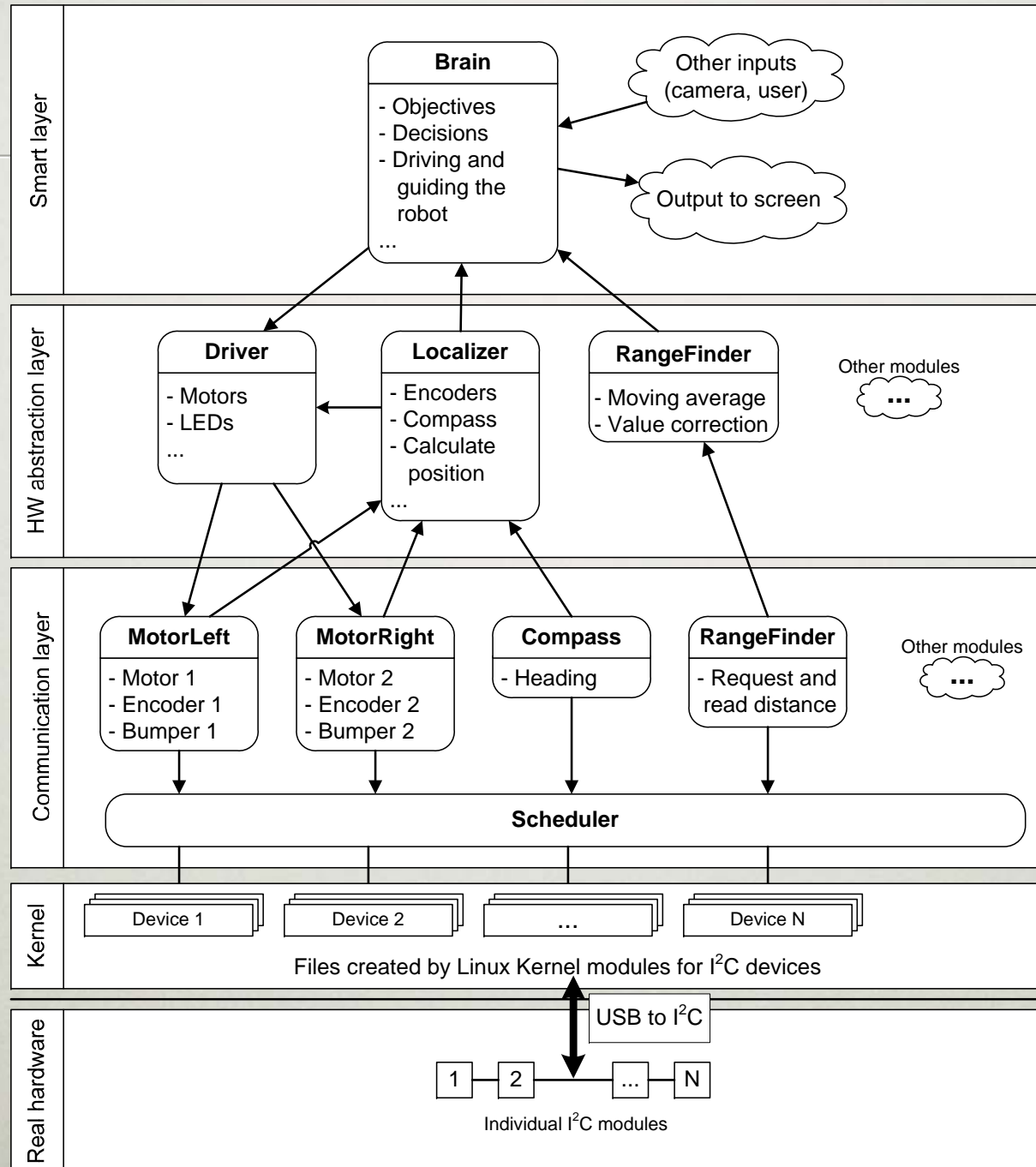
LOGION



SOFTWARE DESIGN



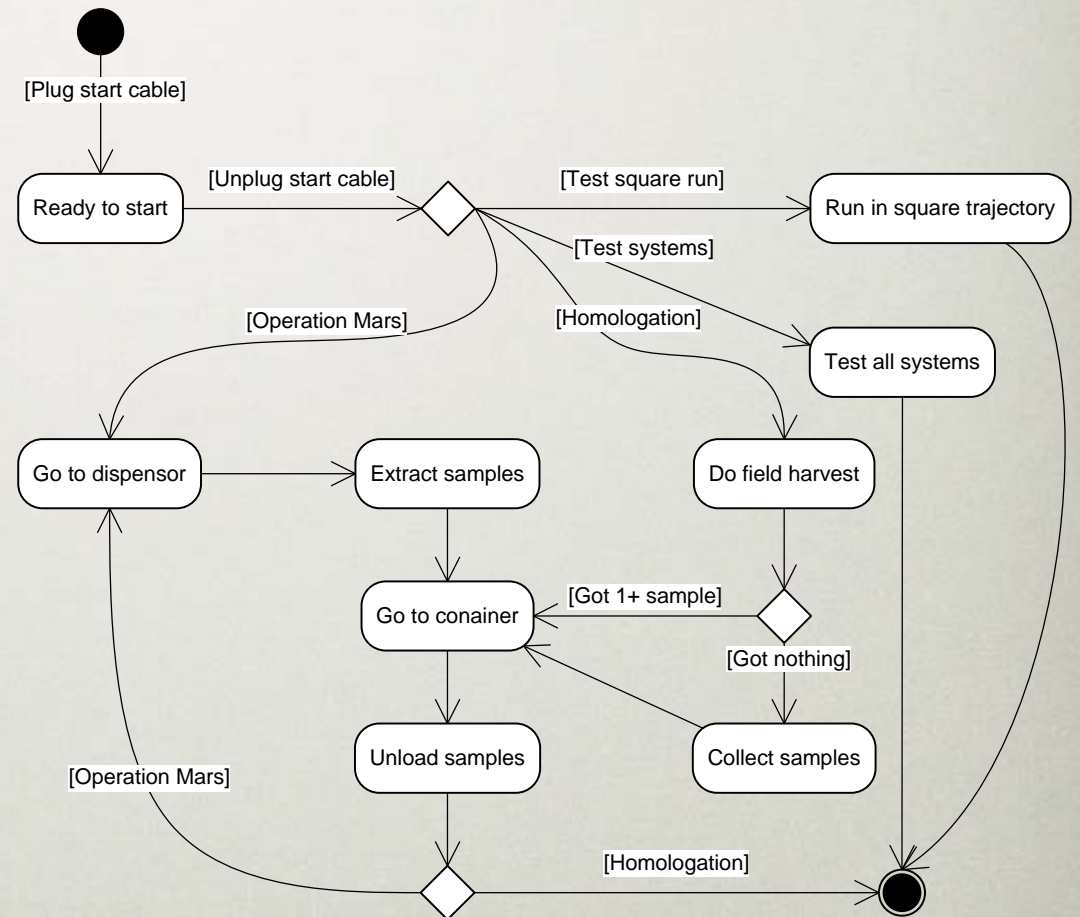
- Universal robot
- Layered, object oriented design
- Hardware abstraction
- Software-hardware mapping



SMART LAYER: BRAIN



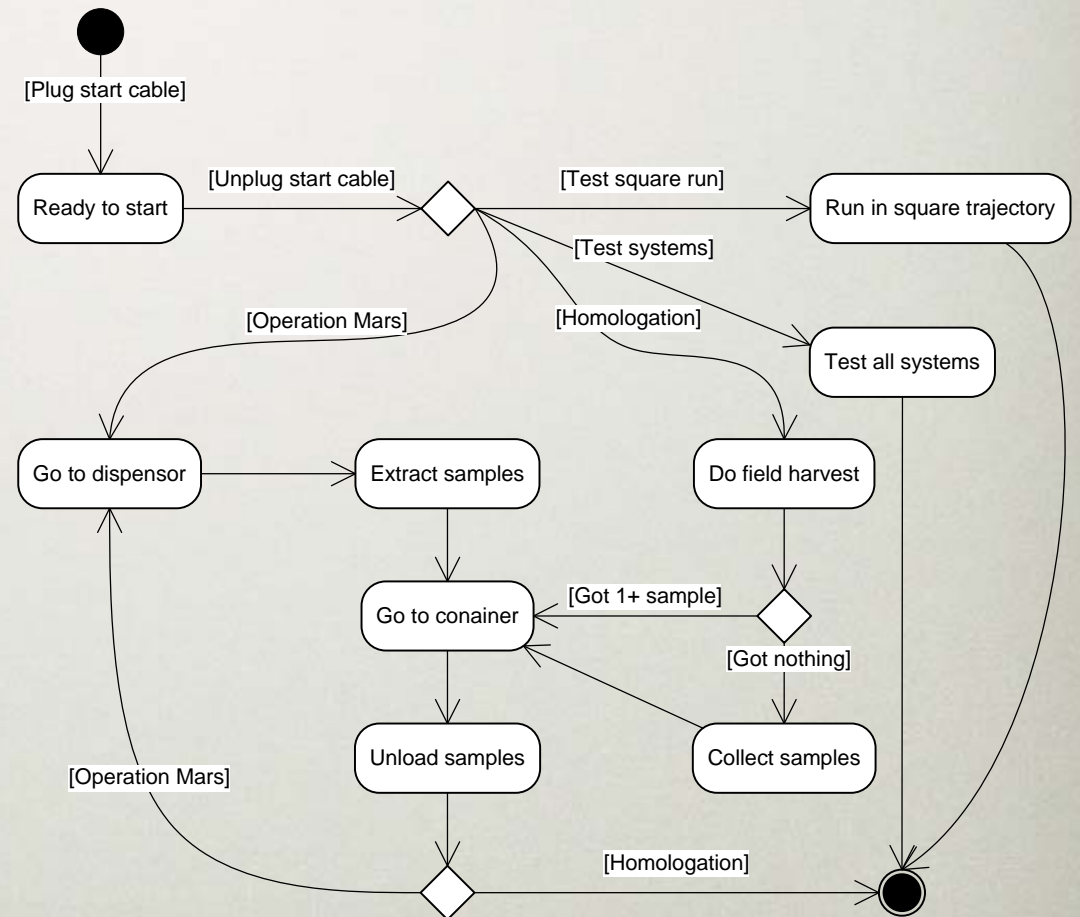
- State automat
- Thread based workers
- State aware triggers



SMART LAYER: BRAIN



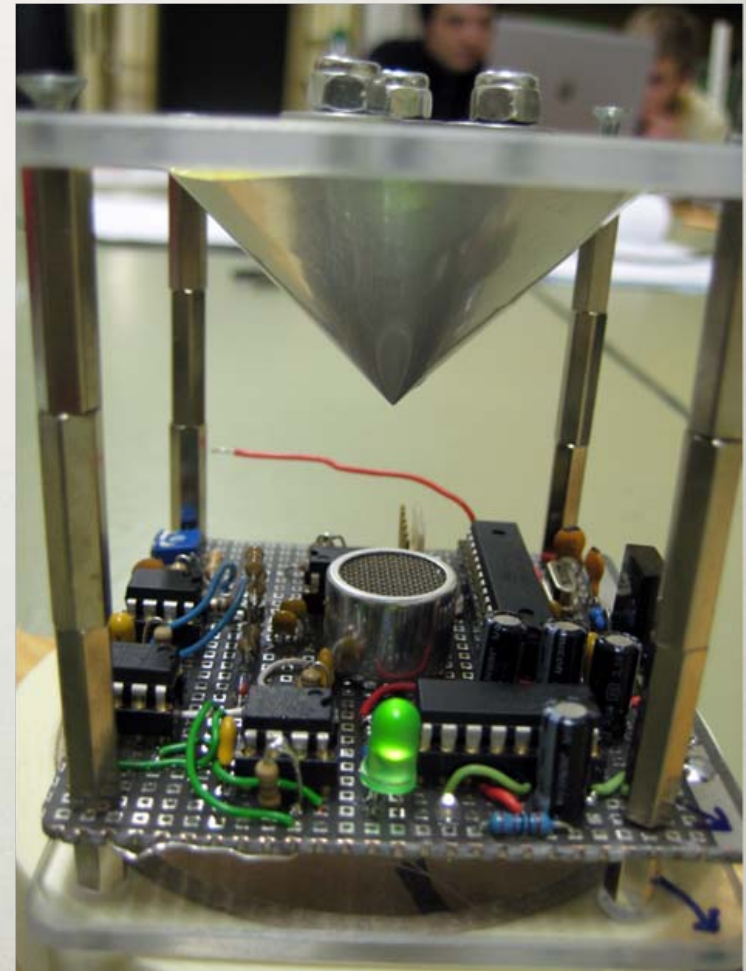
- State automat
- Thread based workers
- State aware triggers



LOCALIZATION

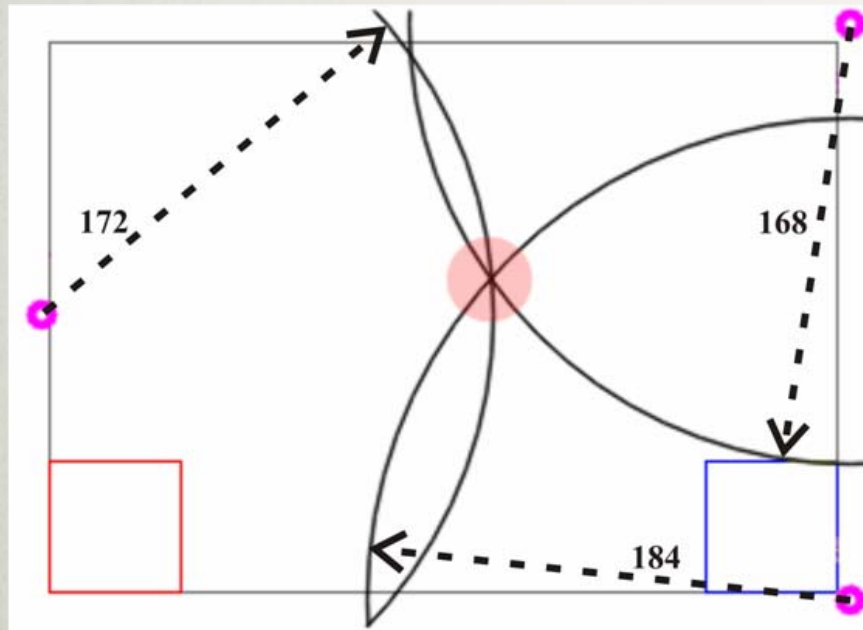


- Monte-Carlo
- Odometry
- Compass
- Beacons
- Reliability (encoded signal)
- Accuracy (5 cm)
- Opponent detection



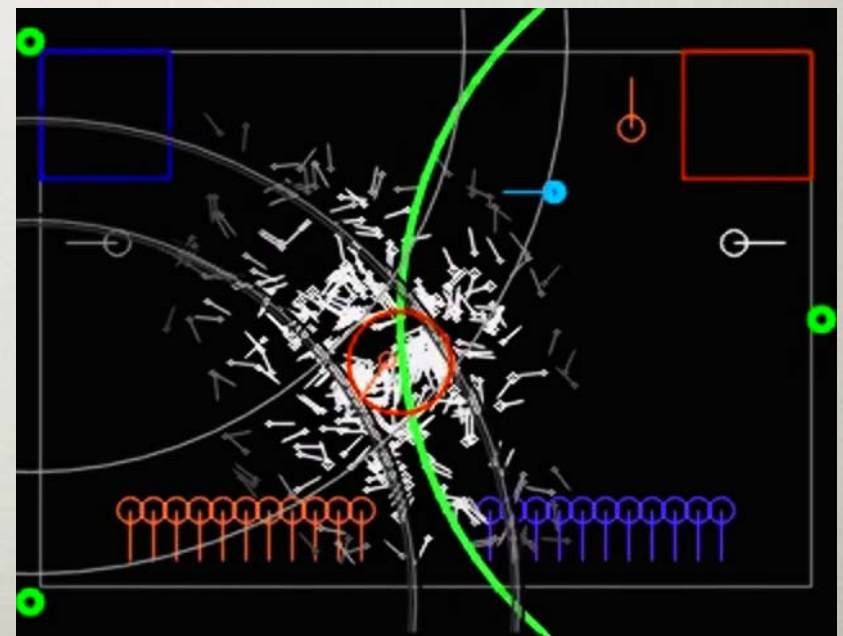


LOCALIZATION



Idea

Robot view

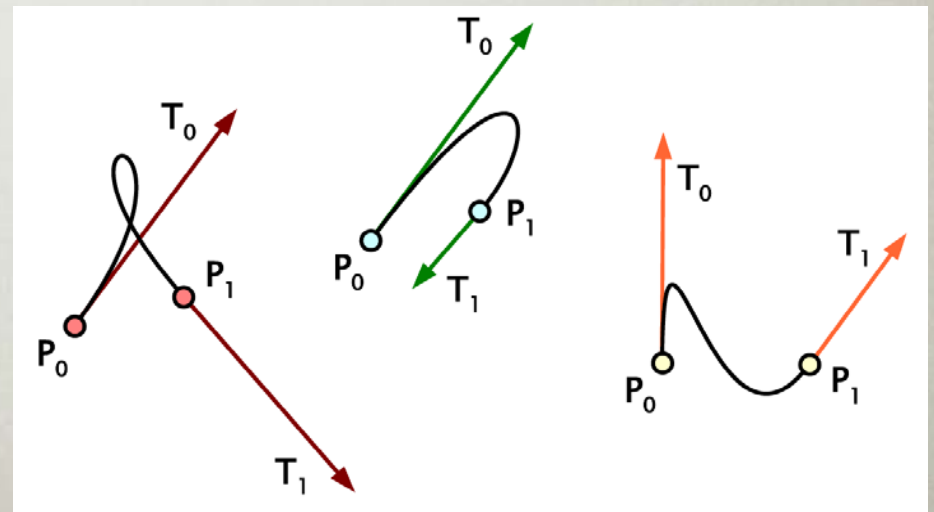
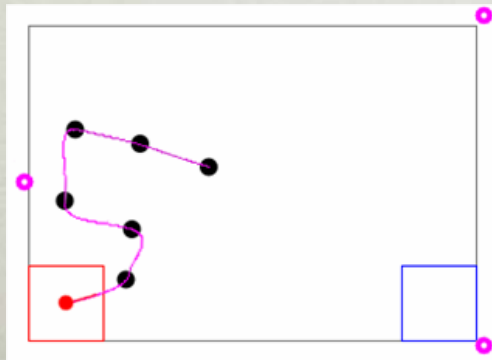




MOVING



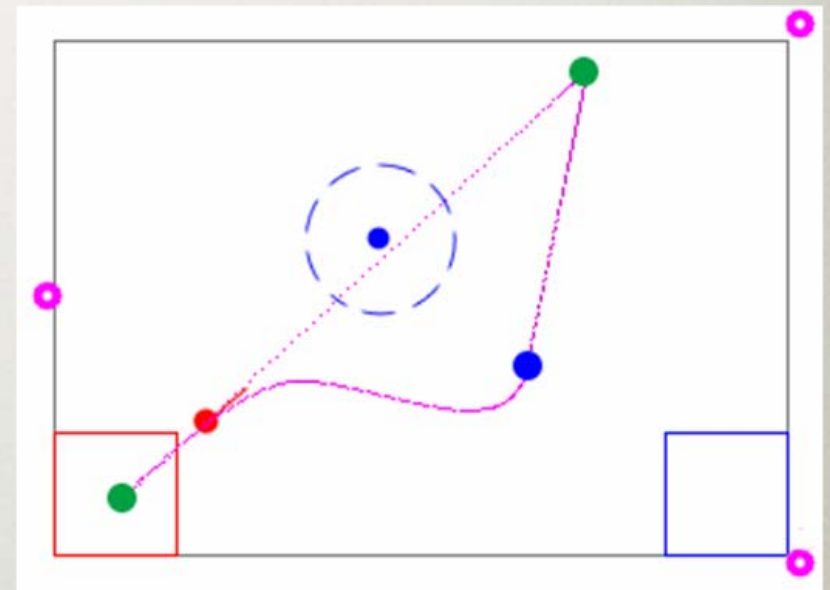
- Ideas:
 - continuous smooth curves
 - adaptable for moving obstacles
- Solution:
 - Hermite curves



OPPONENT AVOIDANCE



- Opponent detection
- Decision making
- Route planning
 - Adding checkpoint
 - Dynamic adjusting
 - Removing checkpoint





THANK YOU FOR YOUR TIME QUESTIONS?

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