Master's thesis

Simulation of complex actuators

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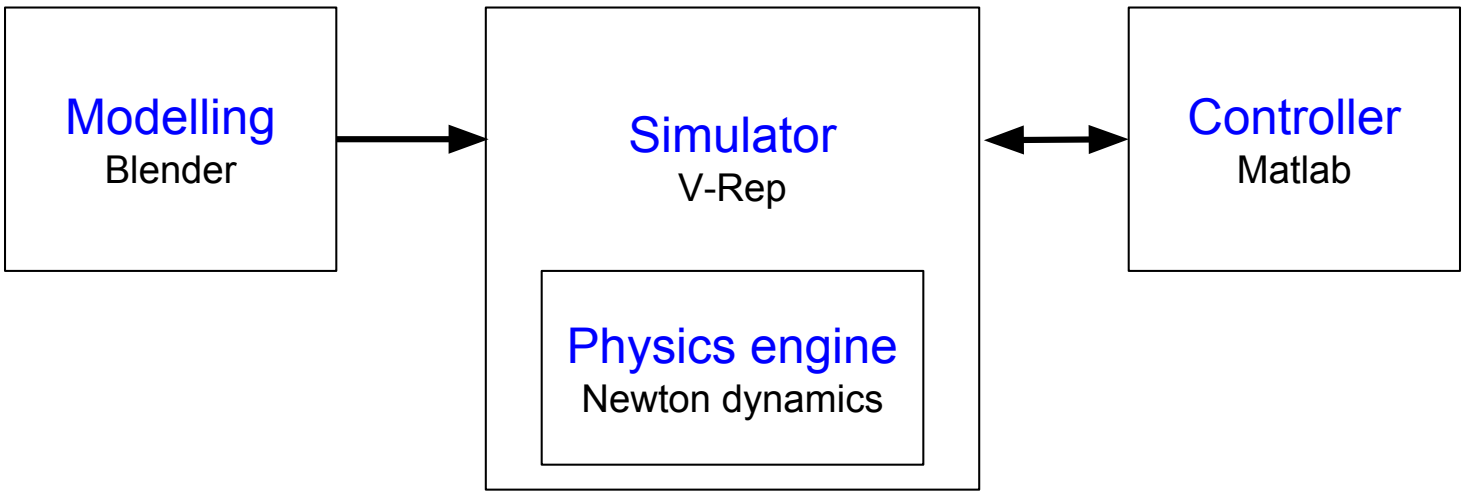
Context & Motivation

Problem statement

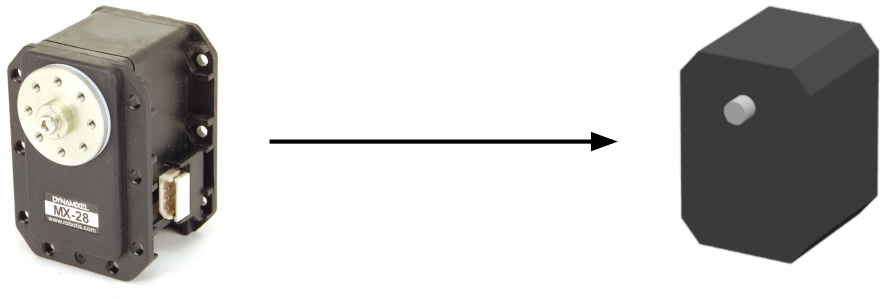
Goals

- realistic rigid bodies physics simulation
- constraints
- the model of the robot should be able to interpret the same instructions that the real robot will

Proposed environment



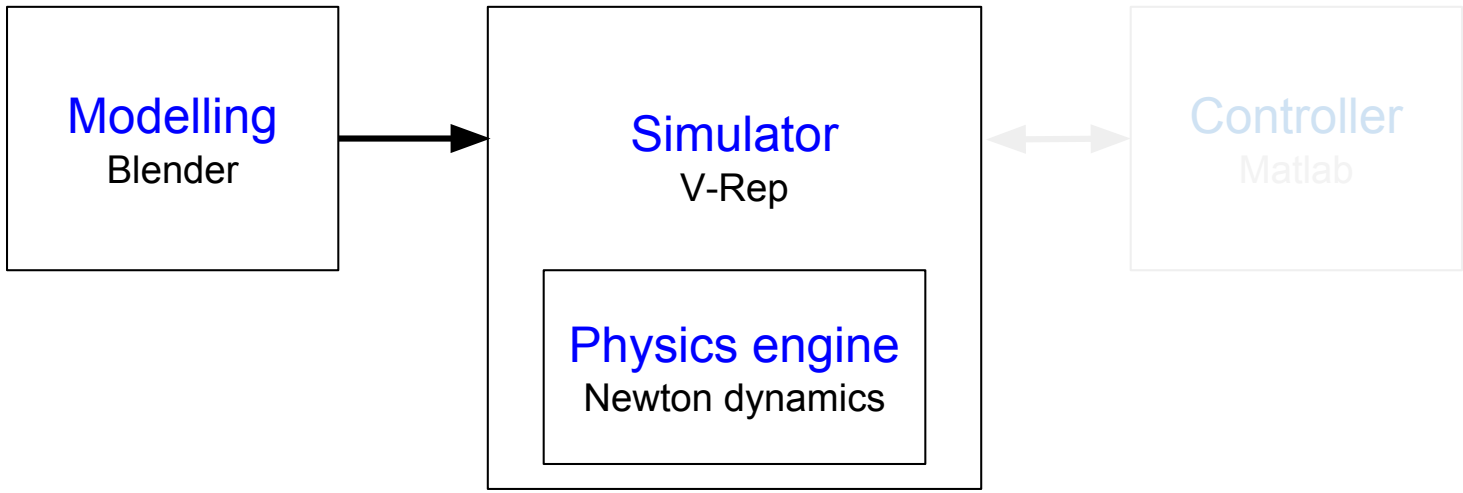
Modelling (1/2)



Problems

- mass & inertia
- volume
- function
- constraints

Modelling (2/2)



Blender

- volume

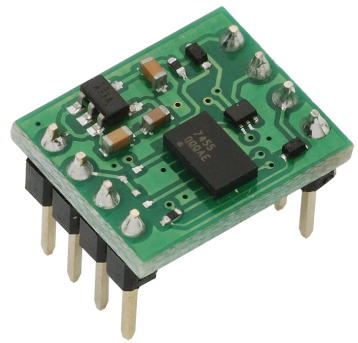
V-Rep

- function

Newton

- mass & inertia
- constraints

Control (1/2)



Problems

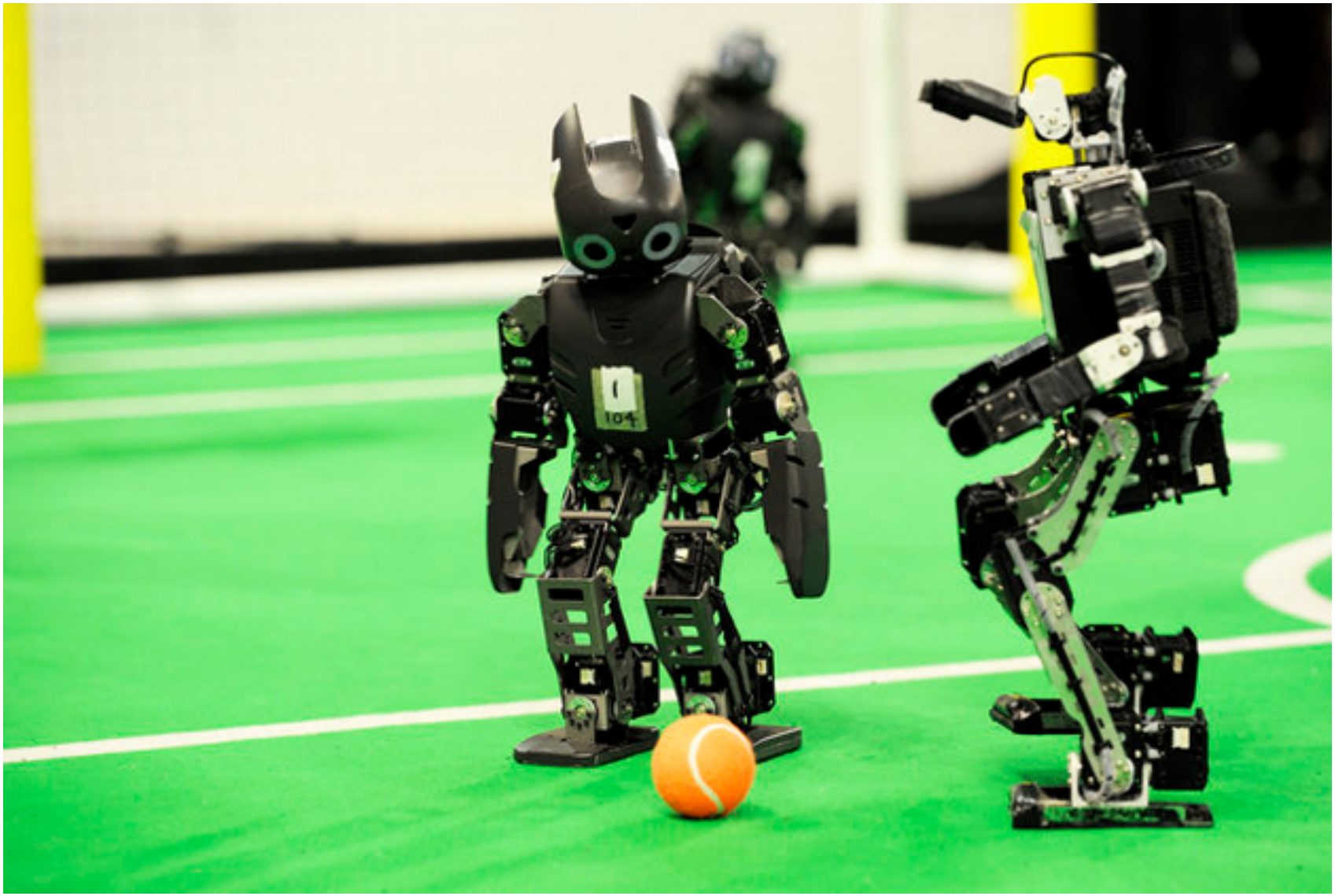
- use same orders as real robot
- retrieve state of simulation

Control (2/2)

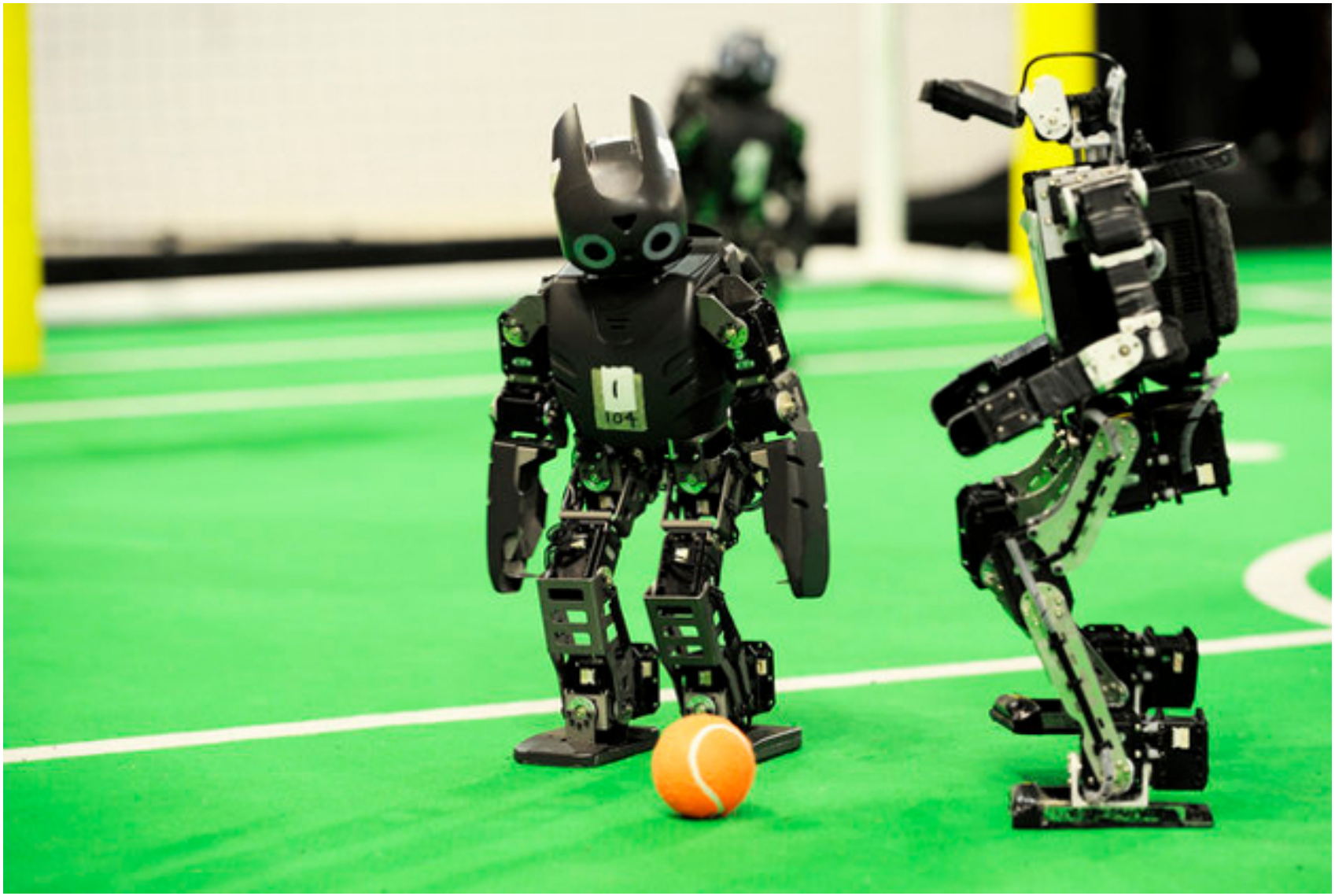
Solutions

- remote control through TCP socket
- scripts

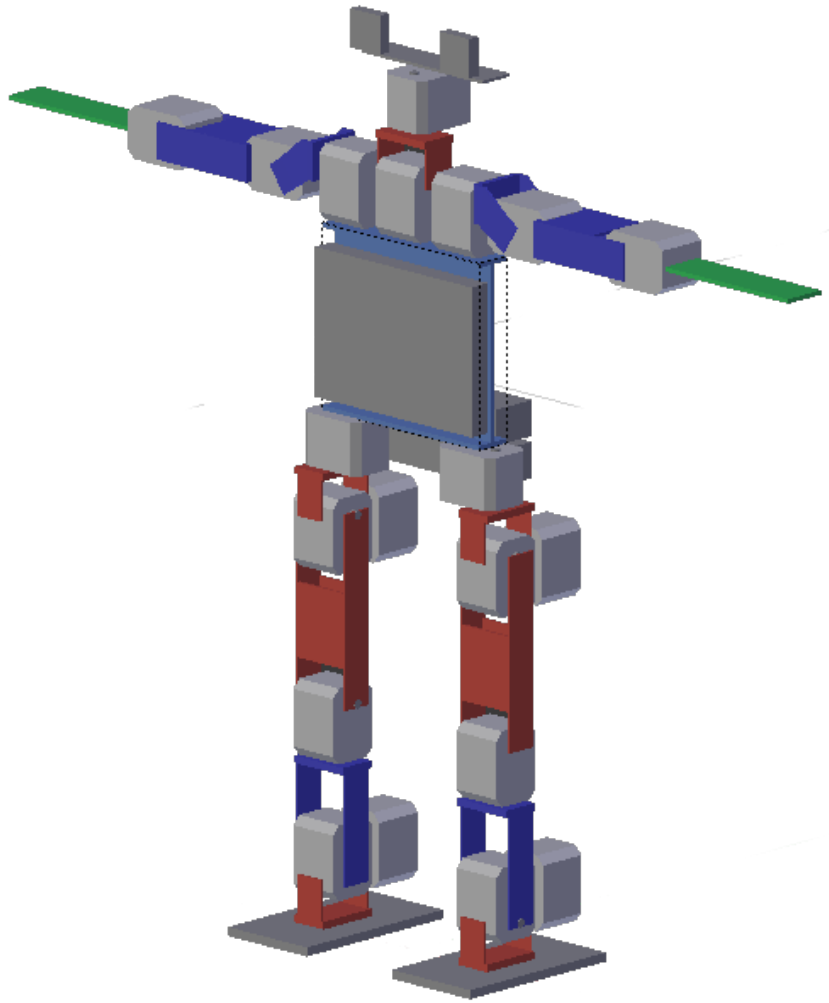
Applications (1/2)



Applications (2/2)



Conclusion



Appendices

Future work

- walking algorithms
- routines : striking, standing up from diverse positions
- improving the model : friction & inertias
- machine vision algorithms
- online simulation