

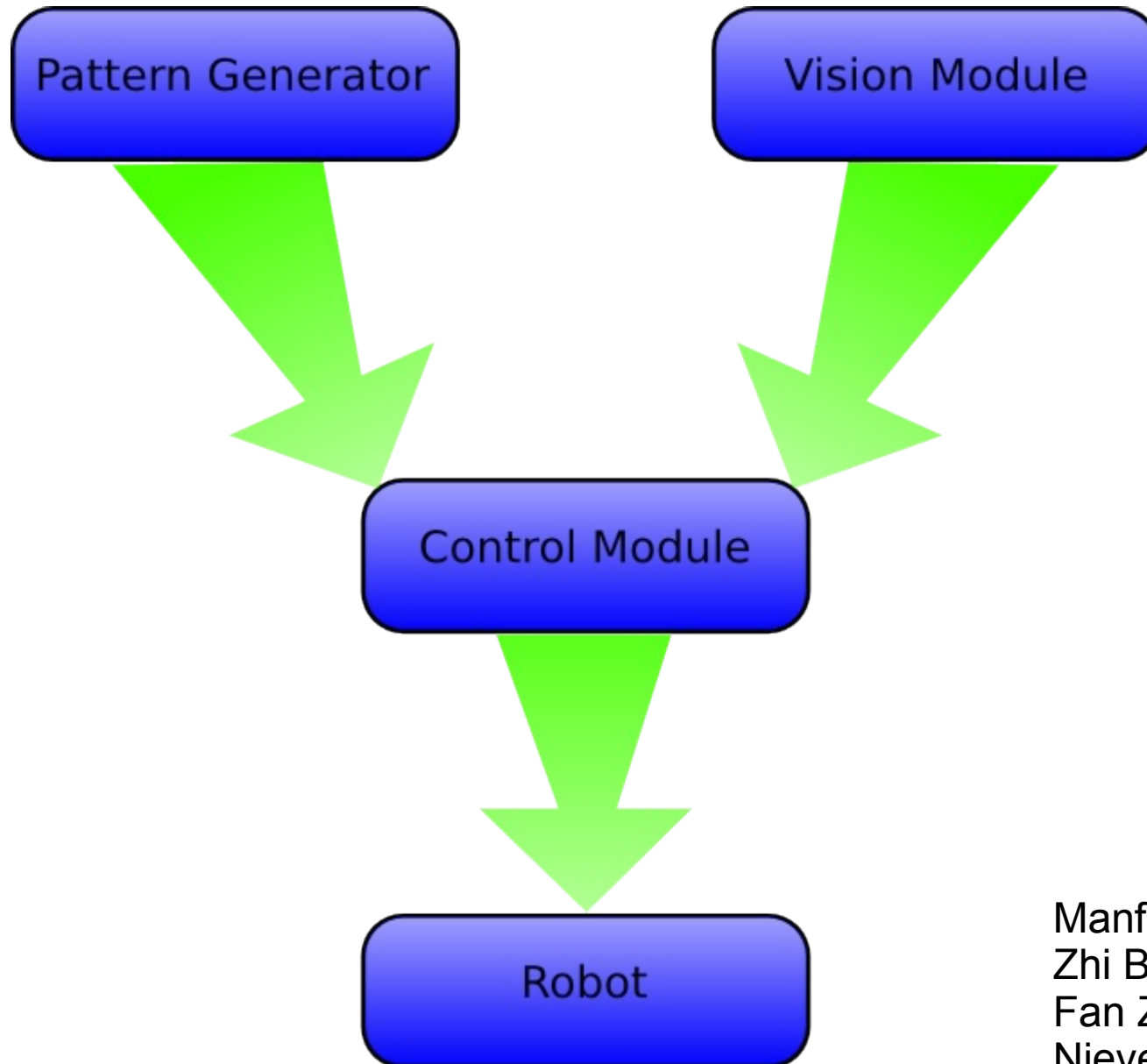
Locomotion Group

Our Team members proposed the following objectives:

1. Matlab simulation for generating various walking patterns;
2. Vision detection of commands from human commander;
3. Communication with real robot iCub via YARP, joint tracking control of 12 DoF legs.

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Fan ZHANG
Nieves Pavón Pulido

Locomotion Group



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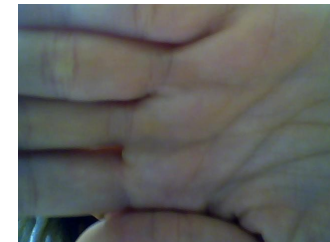
VISION

Four commands must be recognized:

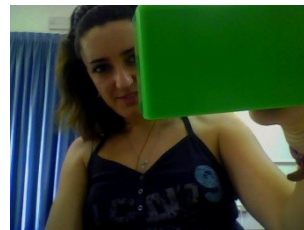
● START



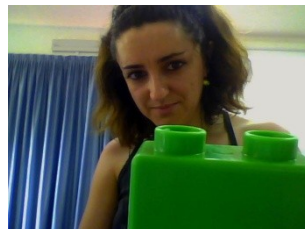
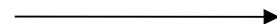
● STOP



● ZERO



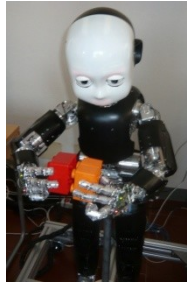
● RESET



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Get Frame

Analyze intensity

If dark → STOP
(put your hand
over his eyes)

Find blue object (filtering colors)

If found → START

UP → ZERO

Find green block

Analyze position

DOWN → RESET

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Advantages:

The method is very simple (based on intensity and color using RGB components). Getting the object from the background is very easy and fast. For this experiment is a good enough method because it allows to obtain the commands in a real time framework.

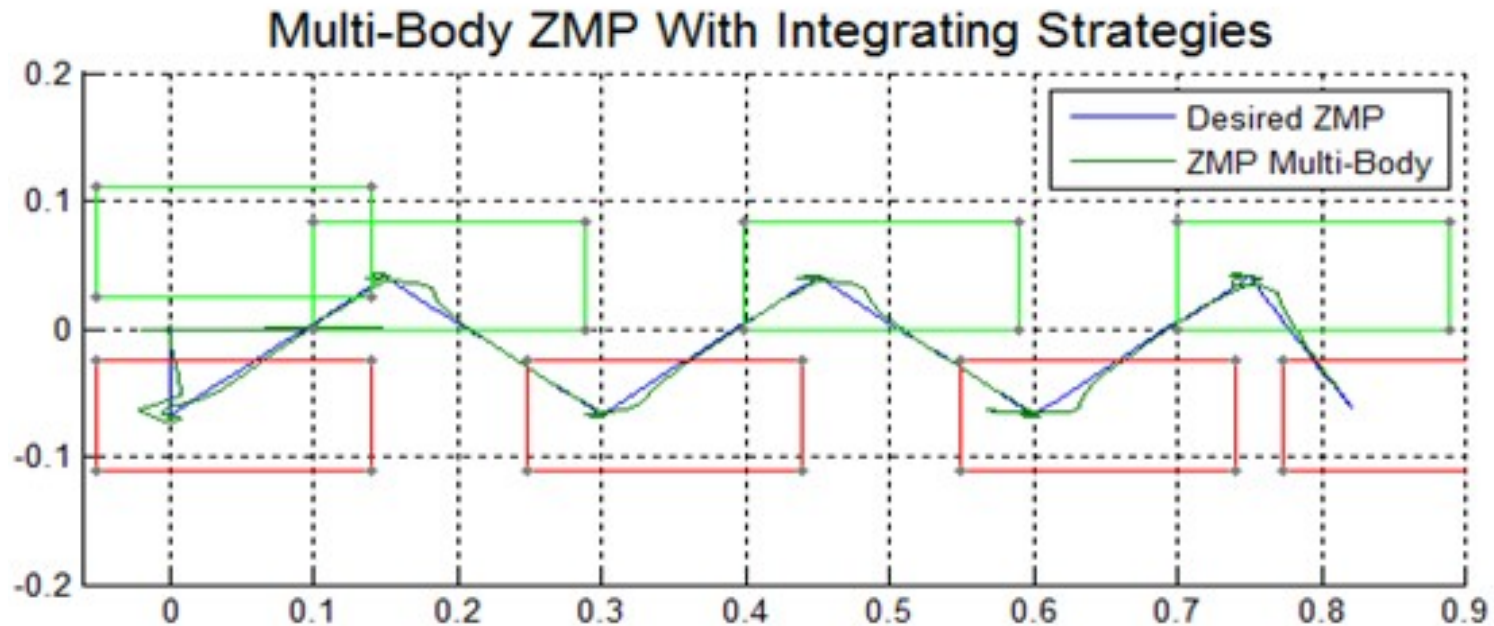
Drawbacks:

Methods based on intensity and colors are very sensitive to changes in the environment and light. (It will be very interesting to test a hybrid method using morphological operations and color filtering -categorizing by means of an intelligent color reduction-).

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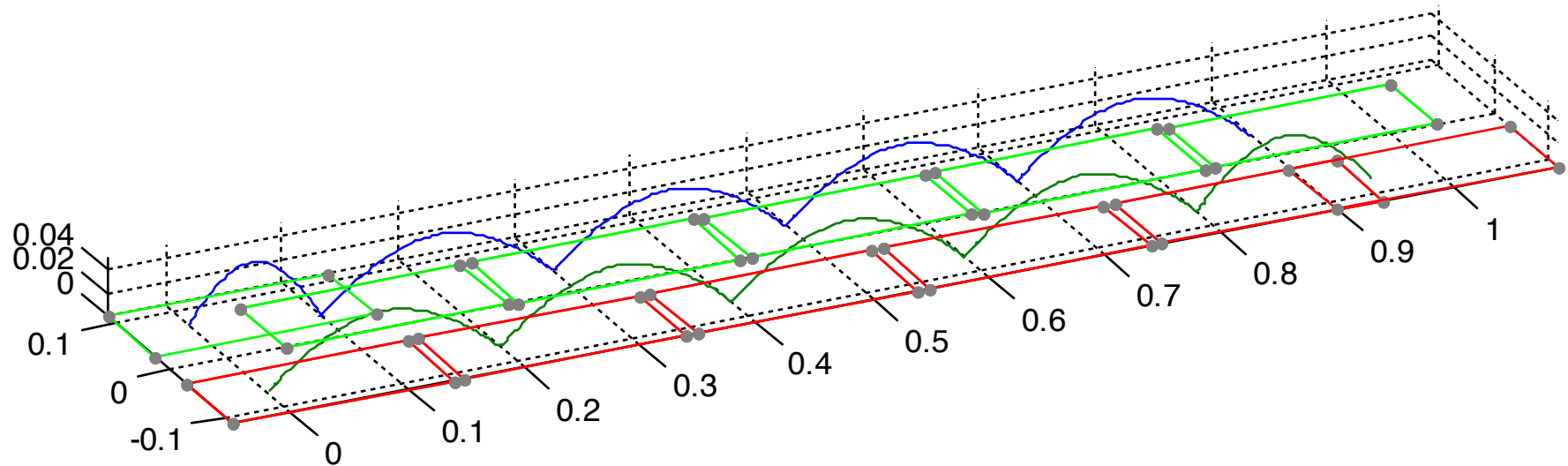
Pattern Generation
-- ZMP Planning



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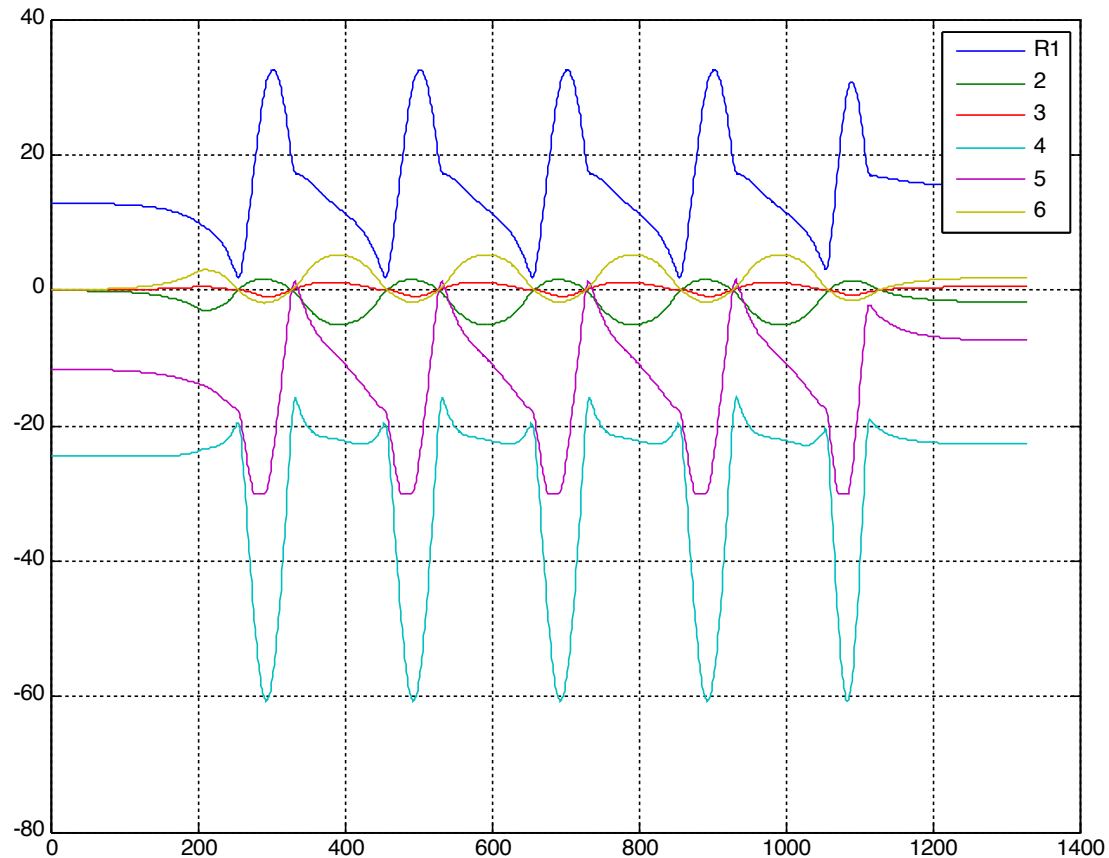
Pattern Generation
-- Foot Trajectory Planning



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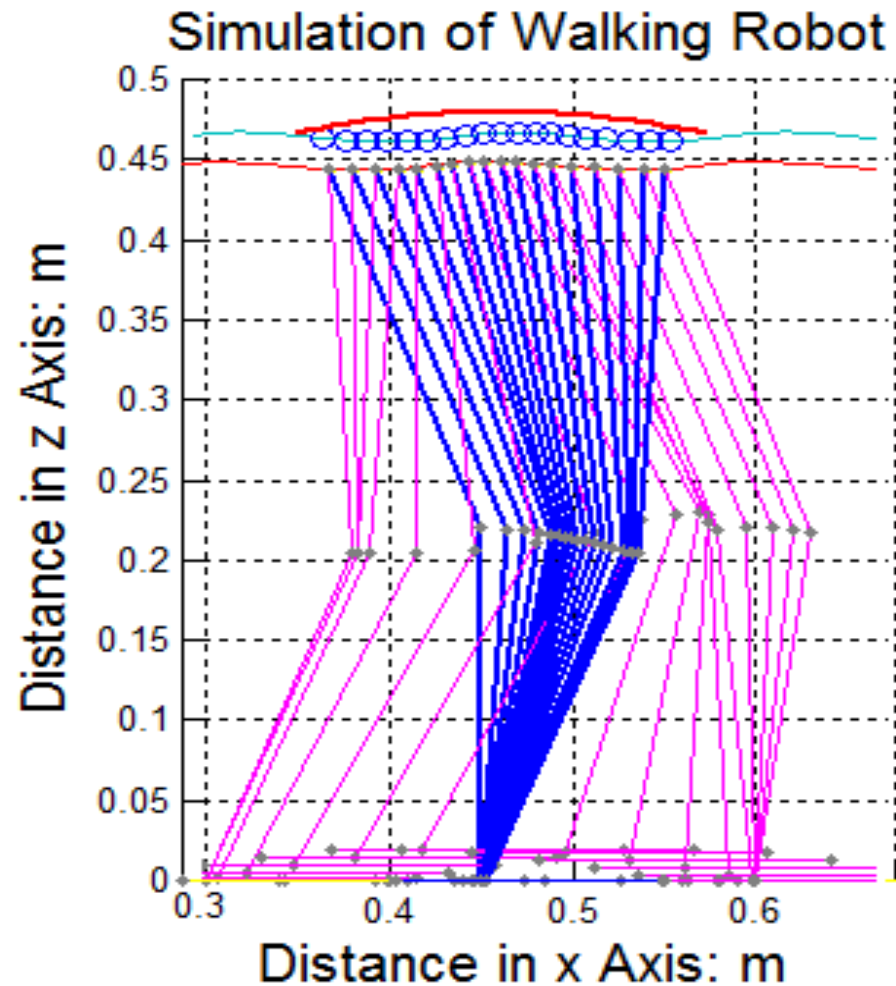
Pattern Generation
-- Inverse Kinematics



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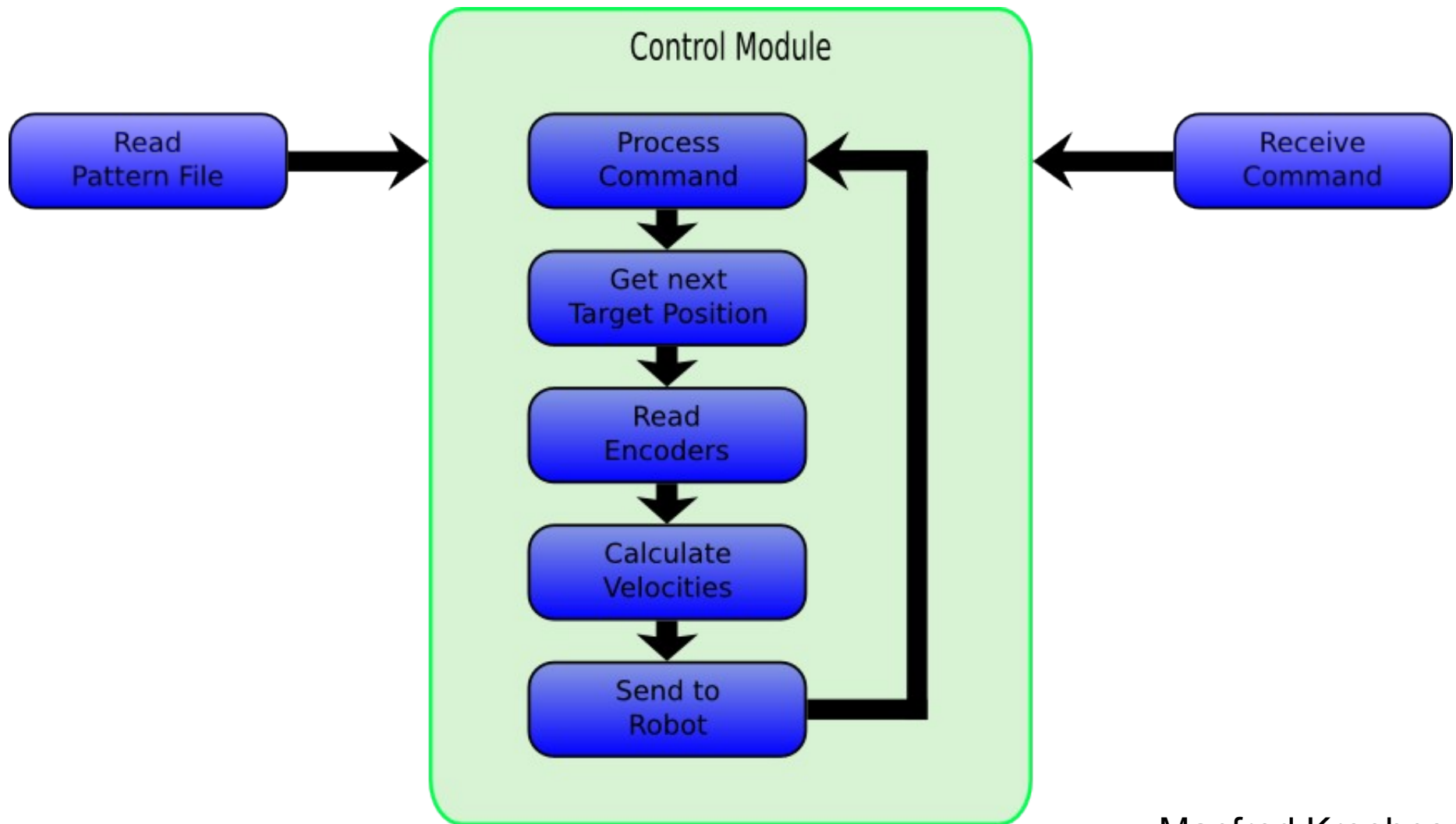
Locomotion Group

Pattern Generation
-- Inverse Kinematics



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Demo Video

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