

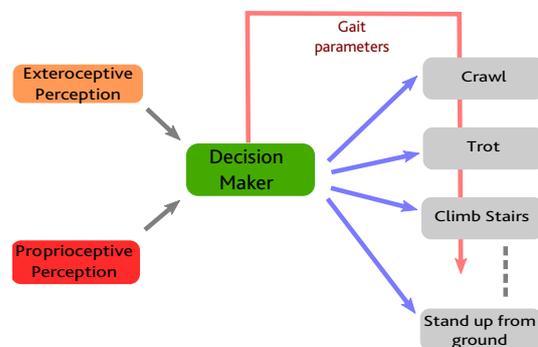
Internship on Implementation of a Decision Maker for Locomotion

Keywords

Task accomplishment, legged robots, locomotion

1 Description

The aim of this student project is to increase the level of autonomy of our locomotion framework. An effective locomotion framework encompasses different levels of autonomy. At a lower level we have several locomotion strategies (e.g. different gaits) that take care of keeping the stability while dealing with the terrain features but require high level commands (e.g. desired velocities from the user). On the other hand, at a higher level, the focus is on improving autonomy, by orchestrating the locomotion modules to fulfill higher level user requirements. These algorithms should take care of choosing the most suitable locomotion strategy and adapting the gait parameters (according to the terrain difficulty) in order to ensure task accomplishment (e.g. reach a goal, pick up an object). At this level is also investigated the smooth transition from one task to the other. We are currently looking for a highly motivated, full-time student to implement a decision maker that makes use of our locomotion blocks to accomplish tasks (e.g. reach a destination goal, opening a door).



We are currently looking for a highly motivated, full-time student (**internship position**) to implement a decision maker that makes use of our locomotion blocks to accomplish tasks (e.g. reach a destination goal, opening a door).

2 Tasks

- Implement decision maker through Skilled Petri Nets [1]
- Sequential composition of tasks to deal with task transition
- Interface with the perception group to retrieve information on the environment
- Experimental verification

3 Requirements

At the moment of application, the candidate must have earned at least a bachelor degree (better a master's degree) in systems and control, robotics, mechatronics engineering or related.

The successful candidate will be involved to work with DLS Lab robotic platforms. Furthermore, the candidate will undertake the task of designing and implement and experiment the decision maker algorithm

in order to be able to realize a full mission in a unstructured environment (with stairs, debris, grass, obstacles and confined spaces).

Further requirements include:

- Strong programming skills in C++ and Python
- Strong communication skills (written and spoken) in English language
- Strong team player;
- Willingness to integrate into a multidisciplinary, dynamic, international research group
- Experience in state machines, automata is a plus
- knowledge of robot dynamics and kinematics is a plus
- Experience with ROS is a plus.
- Hands-on experience in robotic systems is a big plus

4 Duration

Minimum 6 months, with the possibility of extension depending on achieved results.

5 How to apply

To apply send an e-mail including your your detailed CV, university transcripts and cover letter outlining motivation, experience and qualifications for the position to **michele.focchi@iit.it** stating “[Intern2019] Decision Maker Implementation Position” in the subject of the e-mail.

References

- [1] C. Lesire-Cabaniols, “An acting system based on skill petri net composition (aspic),” <https://gitlab.com/MAUVE/Toolchain/aspic>.