



Generation of motion dataset with HPP-LOCO

Consortium



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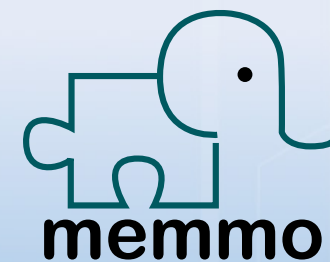


MEMORY OF MOTION



European
Commission

Horizon 2020
European Union funding
for Research & Innovation



What if we could generate complex movements for a robot with any combination of arms and legs interacting with a dynamic environment in real-time? How would this technology revolutionize various industries? How could MEMMO project will lead to a significant step-change in the way that robots are controlled?

MEMMO has the ambition to create such a motion-generation technology that will revolutionize the motion capabilities of robots and unlock a large range of industrial and service applications. Based on optimal-control theory, we develop a unified yet tractable approach to motion generation for complex robots with arms and legs.

The approach relies on three innovative components:

- > A massive amount of pre-computed optimal motions is generated offline and compressed into a "memory of motion".
- > These trajectories are recovered during execution and adapted to new situations with real-time model predictive control. This allows generalization to dynamically changing environments.
- > Available sensor modalities (vision, inertial, haptic) are exploited for feedback control which goes beyond the basic robot state with a focus on robust and adaptive behavior.



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This project is coordinated by the LAAS-CNRS in Toulouse, France.

Ambition

Development of a **generic** methodology to generate **complex movements** for robots with **legs and arms** in **real-time**

Impacts



Impact on aerospace industry

- > Enhanced production rates
- > Reduced infrastructure adaption when automating
- > Reduced need for specialized end-effectors



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Impact on lower-limb paralysis rehabilitation

- > Exoskeleton in rehabilitation center
- > Longer term: rehabilitation exoskeleton at home

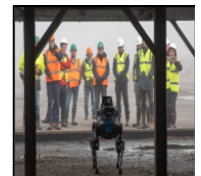


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Impact on inspection of civil-engineering structures

- > Removing workers from dangerous fields
- > Automated measurement of concrete tunnel linings
- > Continuous supervision of demolition zone



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