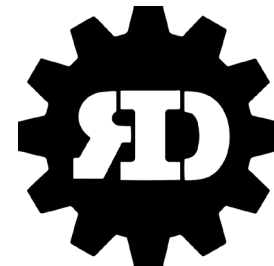


NSF NRI 2.0
**FND: Immersive whole-body teleoperation of
wheeled humanoid robots for dynamic mobile
manipulation (grant #2024775)**
Session 4, #16

PI: Joao Ramos, Mechanical Science and Engineering
Co-PI: Kris Hauser, Computer Science
University of Illinois at Urbana-Champaign



Motivation:



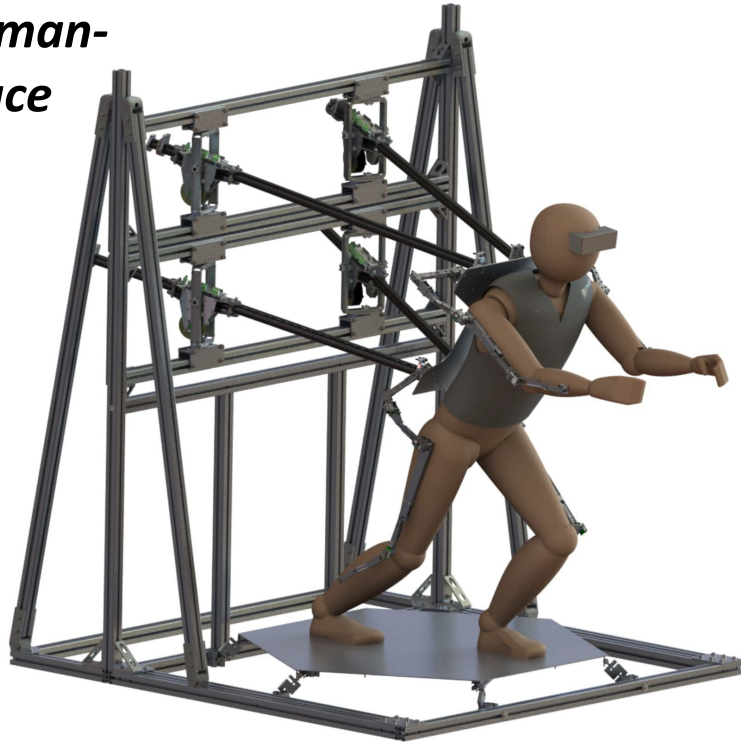
Emergency responders get injured or die due to physically demanding labor.



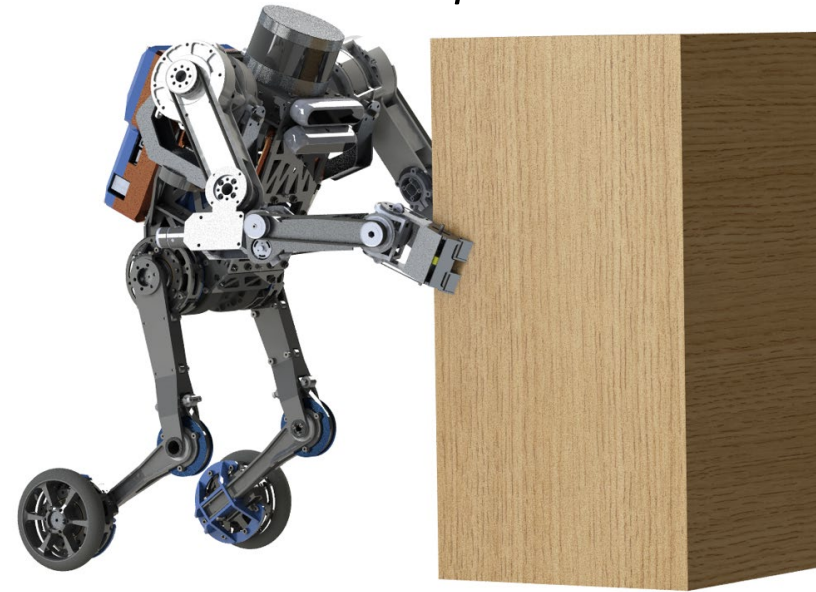
But robots lack the ability to coordinate their body to manipulate objects.

Research overview:

Whole-body Human-Machine Interface



SATYRR - Semi-Anthropomorphic Teleoperated dYnamic Rolling Robot



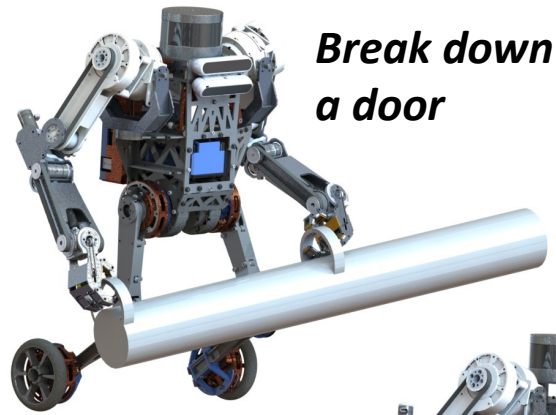
Specific Aims:

Aim 1: Implement whole-body bilateral teleoperation hardware.

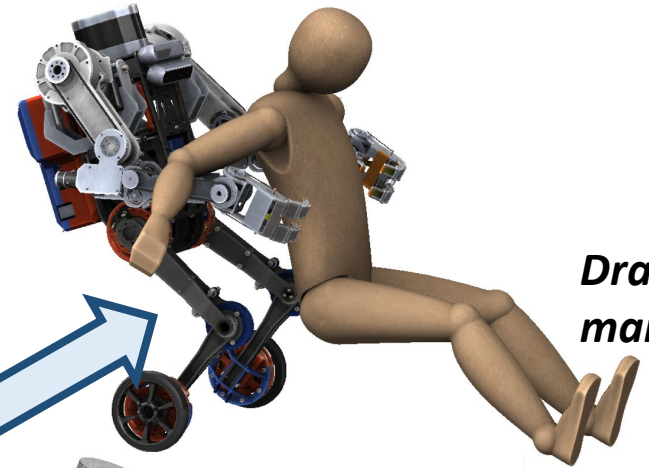
Aim 2: Develop and evaluate bilateral teleoperation strategies for physical tasks.

Aim 3: Create algorithms to improve teleoperation safety using shared autonomy.

Evaluation: the obstacle course

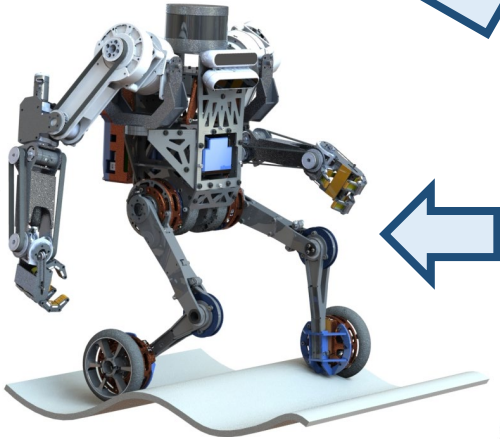


Break down a door

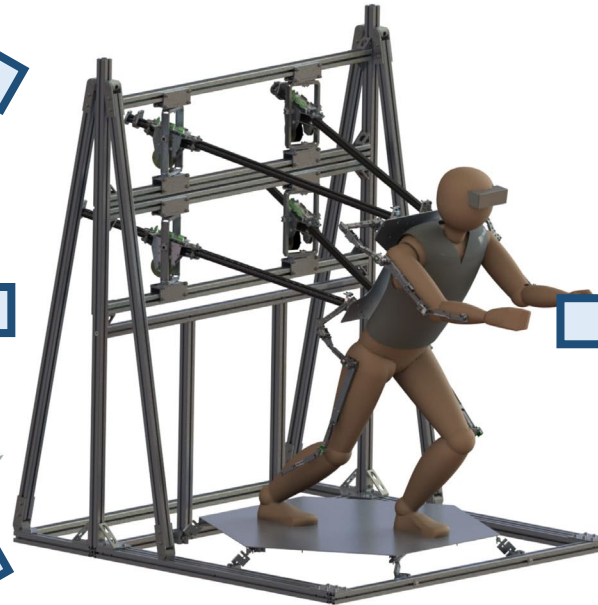
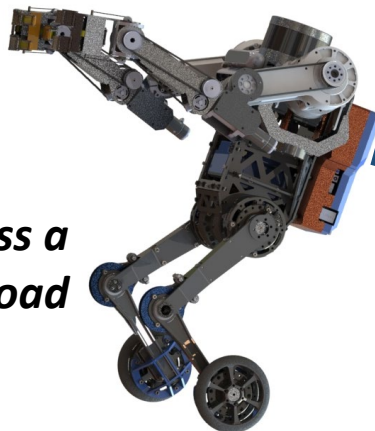


Drag a mannequin

Navigate bumpy terrain

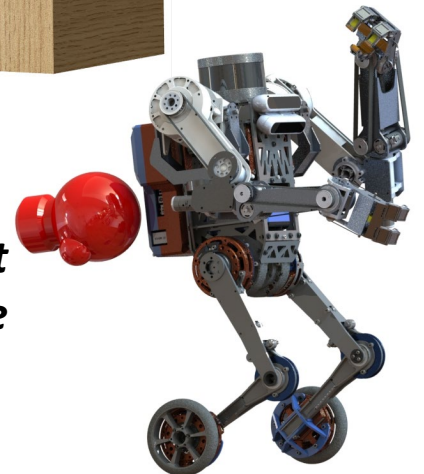


Toss a payload



Push a large object

Reject disturbance

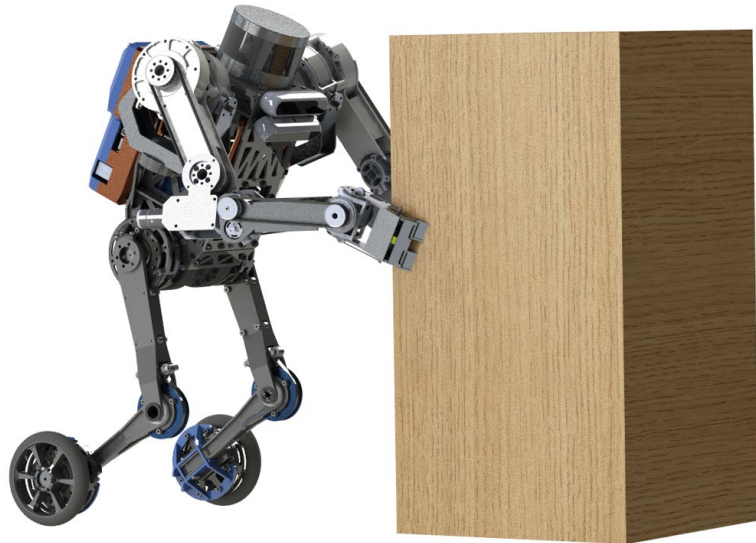


Expected impact:



Intellectual Merit:

- Contributions to whole-body haptics.
- Principles for teleoperation of dynamic whole-body motions.
- Efficient algorithms for safe shared autonomy



Broader Impacts:

- K-12 Summer Camp.
- Inclusive research plan.
- Public demonstrations of the system.
- Workshop on teleoperation for dynamic physical tasks.
- **Creation of capable robotic first responders.**