PennState College of Engineering

ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

Humanoid Robotics (Real and Simulated)

LPAC

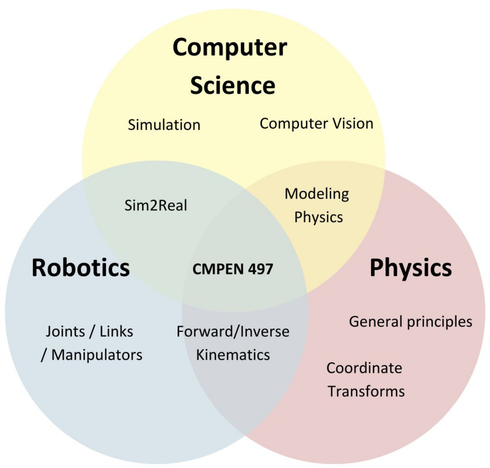
Jeff Koumba[1] , Yuan Gao[1], Keaton Kraiger[1], Robert Collins[1], Yanxi Liu[1,2]

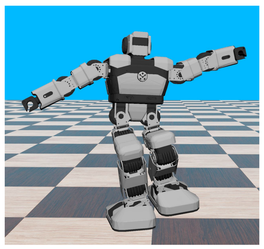
[1]Dept. of Comp. Sci. & Eng. [2]Dept. of Elec. Eng.

The Pennsylvania State University, USA

CMPEN 497: Humanoid Robotics

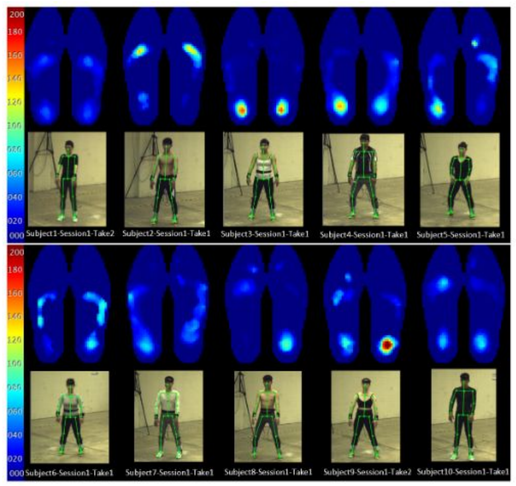
New course that explores the kinematics and dynamics of state of the art, programmable humanoid robots in combination with principles of physics, computer vision, and AI. Students will get hands-on experience with the physical robots as well as simulated robots.





Jesse Scott, Bharadwaj Ravichandran, Christopher Funk, Robert T. Collins , Yanxi Liu. "From image to stability: Learning dynamics from human pose." Computer Vision–ECCV 2020: European Conference, Glasgow, UK, August 23–28, 2020, Proceedings, Part XXIII 16. Springer International Publishing, 2020.

Using **The PSU Taiji MultiModal (PSU-TMM100)**, which is a **multimodal dataset of human motion sequences**, we propose and validate two end-to-end deep learning architectures to learn foot pressure distribution maps (dynamics) from 2D or 3D human pose (kinematics).



- **Foot Pressure**
- **Video**
- **Motion Capture**

ECCV

Human + Humanoid Robotics

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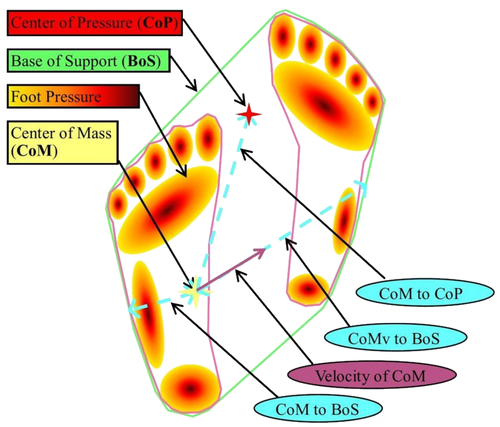

Scott, Jesse, John Challis, Robert T. Collins, and Yanxi Liu. "Image-Based Stability Quantification." IEEE Transactions on Neural Systems and Rehabilitation Engineering 31 (2022): 564-573.

IEEE

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"Dancing with Robots" summer camp (for girls)

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Photo

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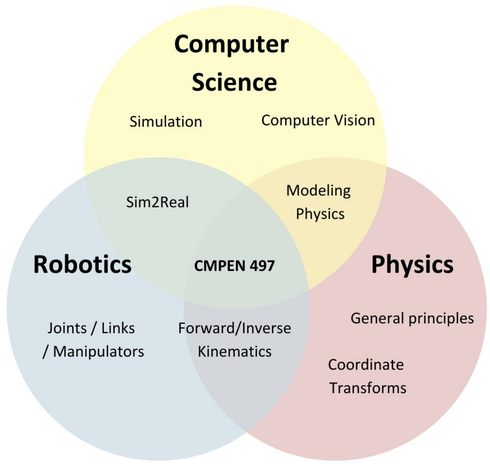

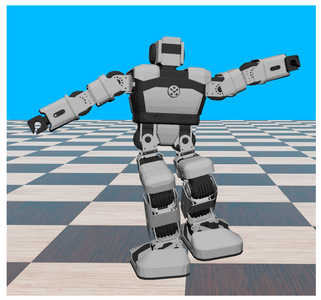

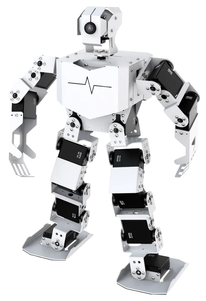

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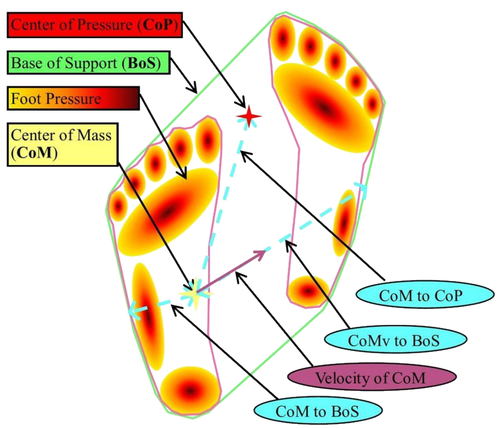

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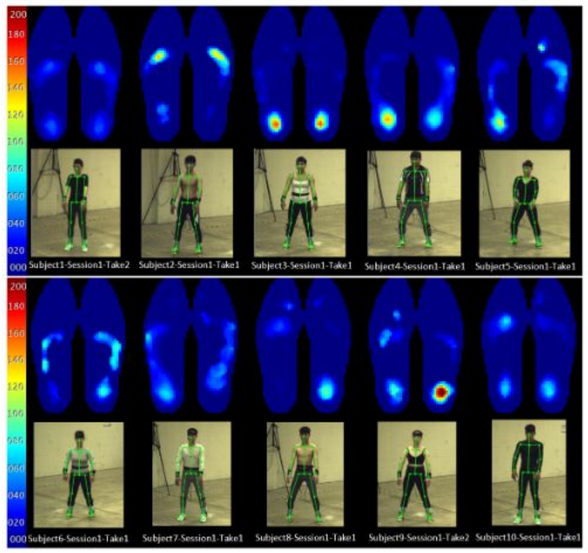

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