

Reinforcement Learning & Neuro-Musculo-Skeletal Modeling

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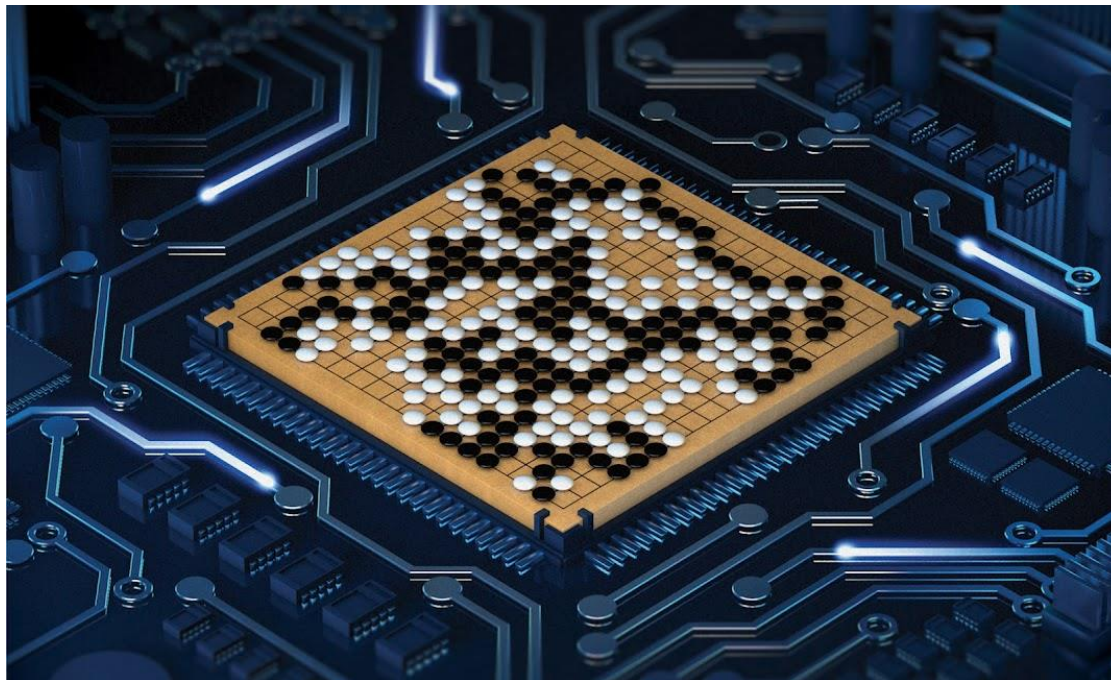
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Reinforcement Learning

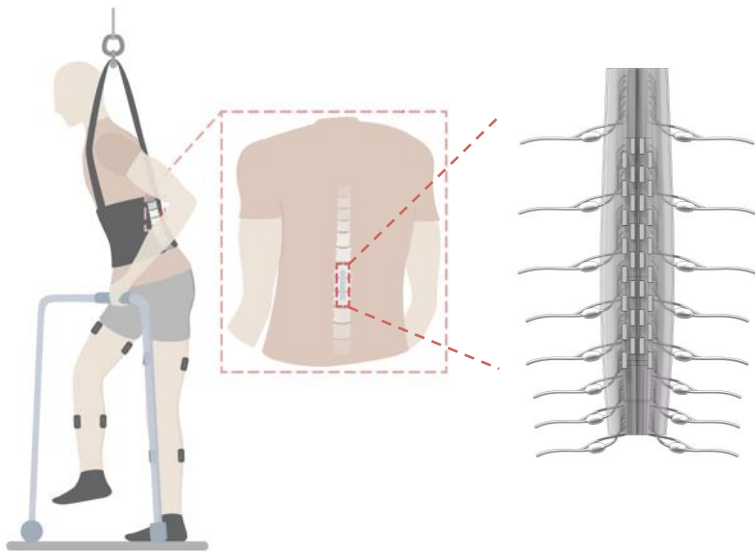
Control a complex system



Reinforcement Learning

Control a complex **dynamical** system

from the inside out



Neural stimulation via implanted devices

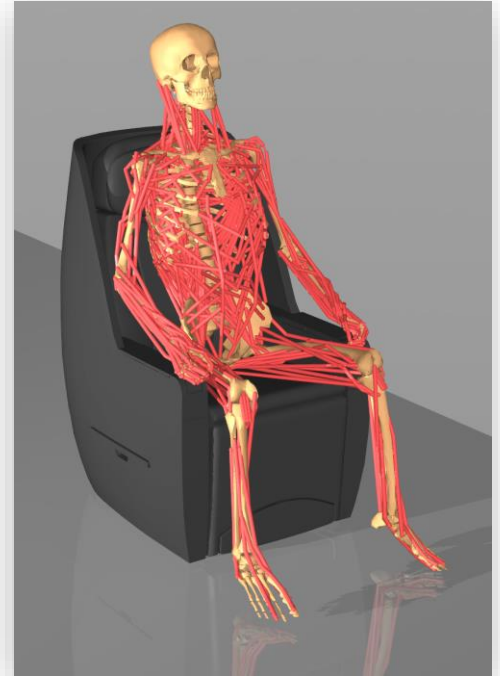
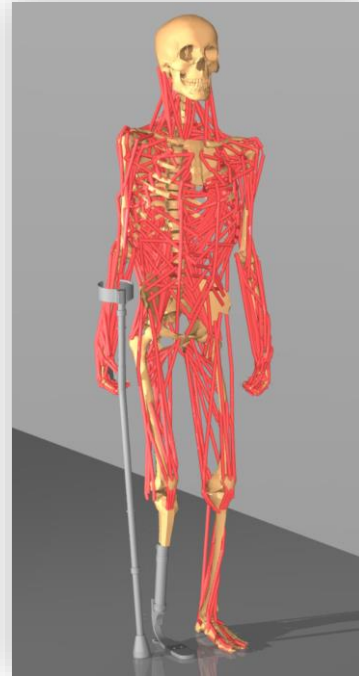
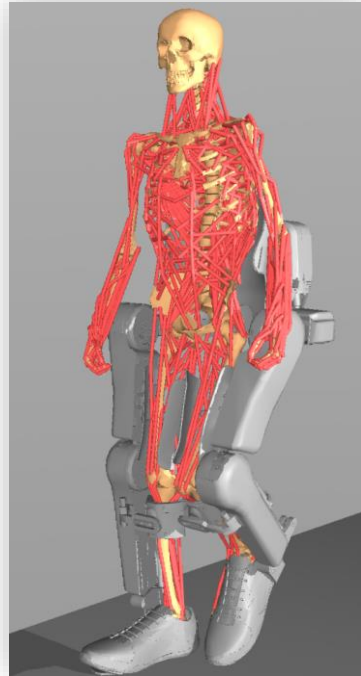
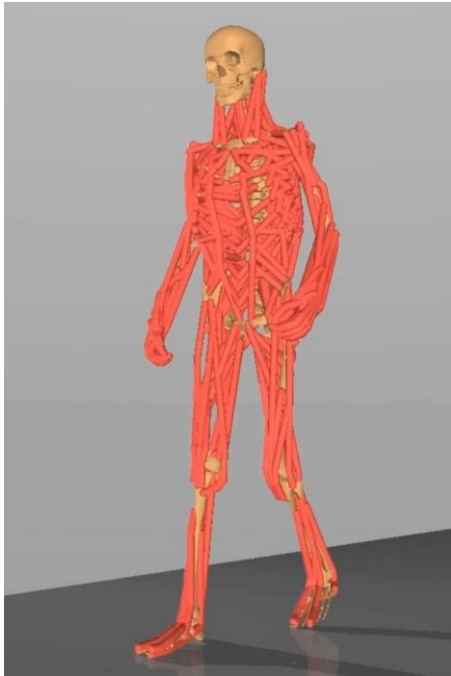
from the outside in



Gait control via exoskeleton

Neuro-Musculo-Skeletal modeling

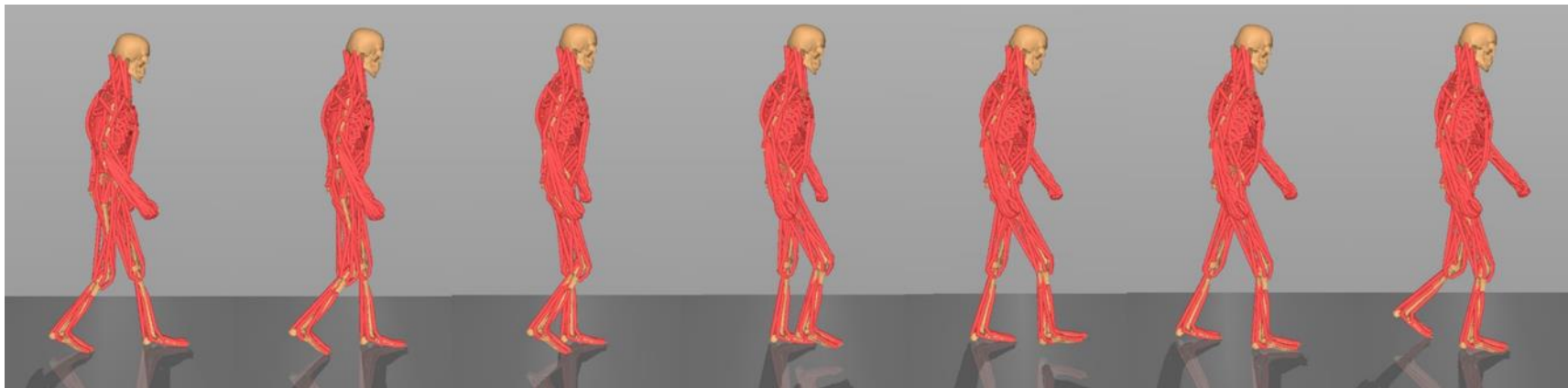
Modeling & Control of Human Motion



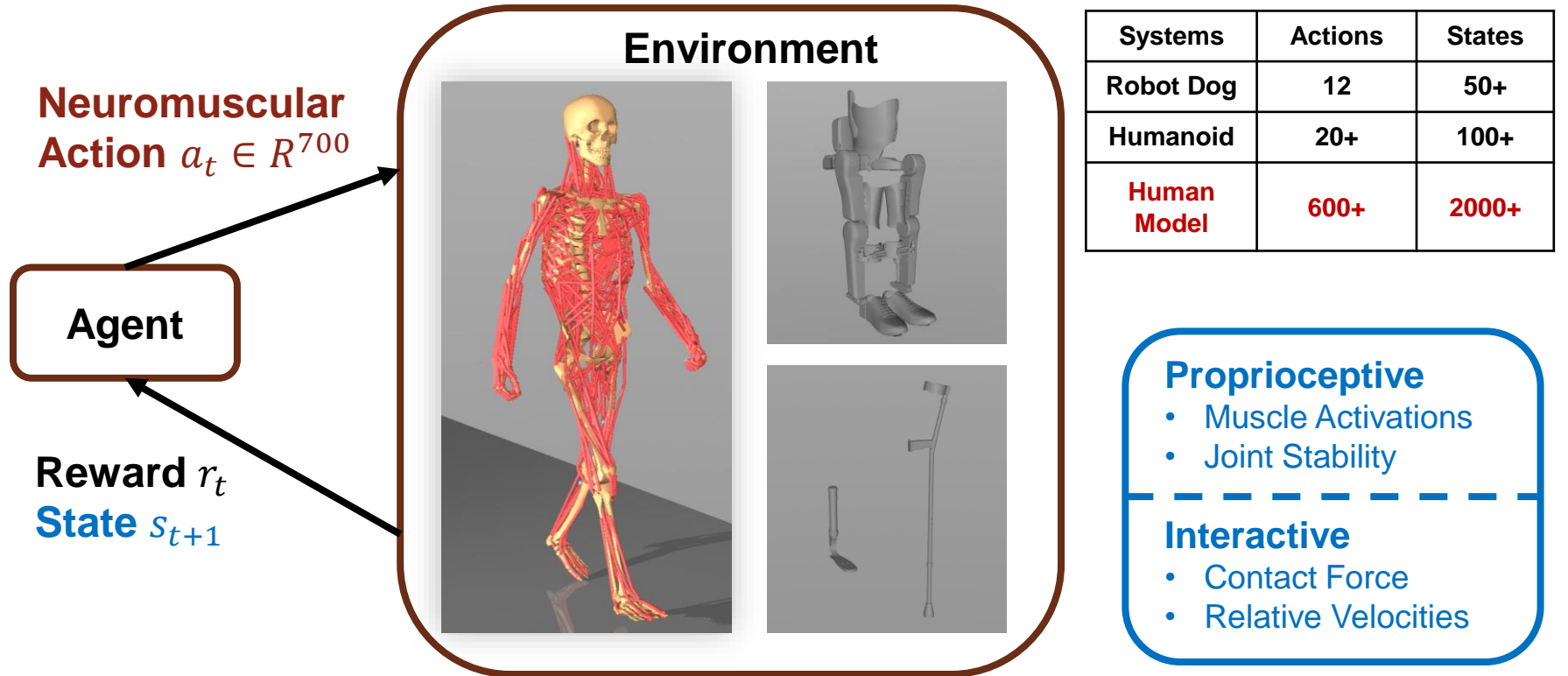
Dynamical Model of Musculo-Skeletal System

■ MS-Human-700:

- › Comprehensive collection of muscle-tendon units
- › High anatomical accuracy, able to interact with environment
- › High computational efficiency, can be controlled via reinforcement learning

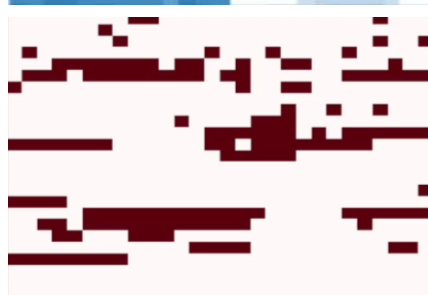
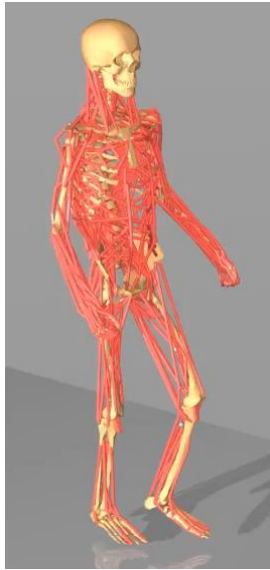


Whole-body Human Motion Control



Whole-body Human Motion Control

Controlling and Understanding Motion from the Bottom Up

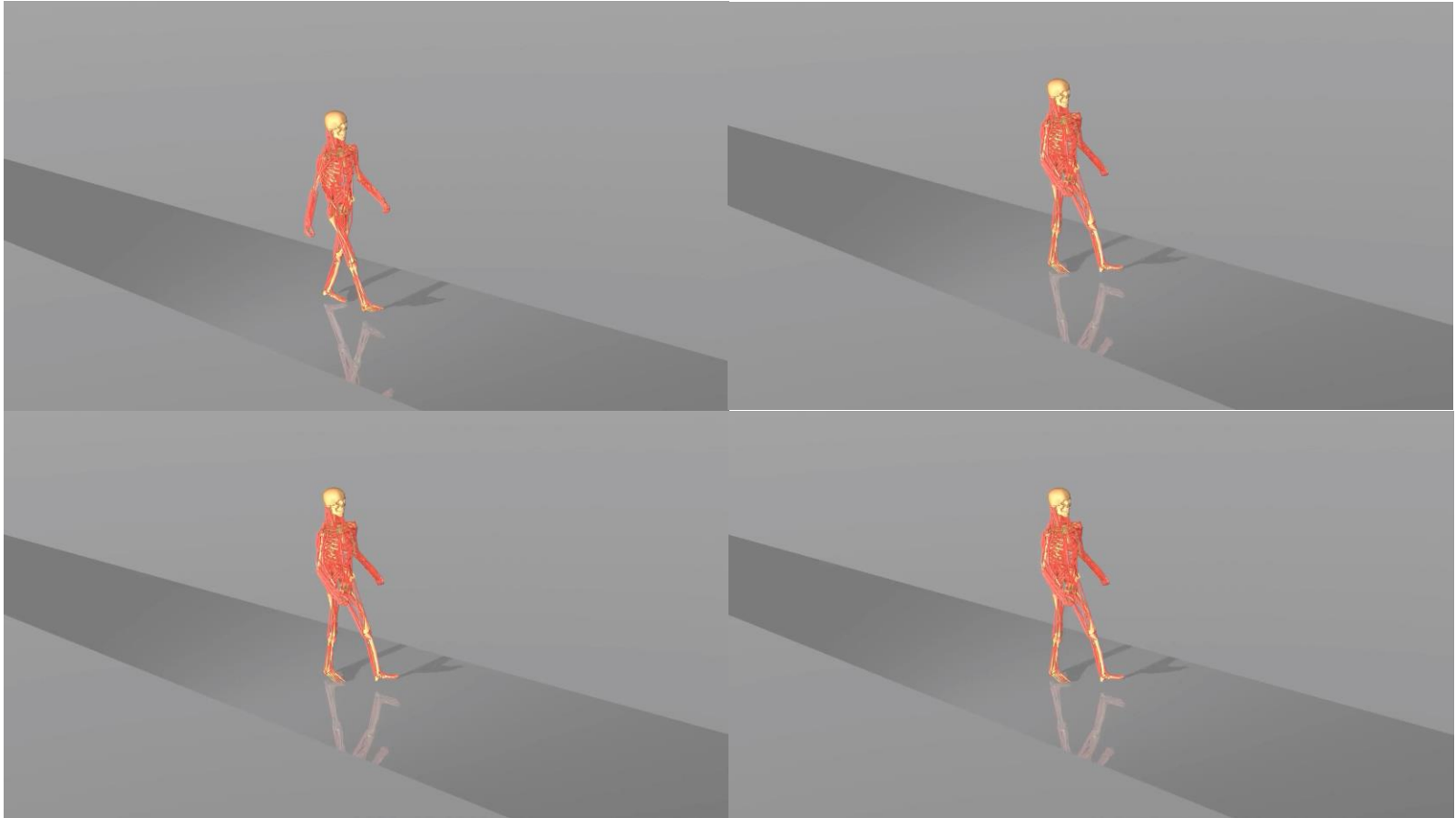


Sensing

Control



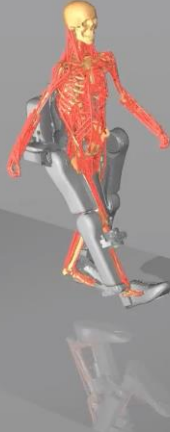
Simulation of Whole-body Walking



Walking Forward



Human-Exo Interaction



Prosthetic Walking



Slowed

Learning to Move

Self Model for Human Movement Control

reinforcement learning &
neuro-musculo-skeletal modeling
for
human motion control
& interactive robotics

