Balint Karoly Hodossy

7 Barclay Close, SW6 5QG
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bkh16@ic.ac.uk

Education

2020-2024 **Bioengineering Research PhD (CDT in Prosthetics and Orthotics), Imperial College London**
Supervisor: Dario Farina

2016-2020 **MEng Biomedical Engineering, Imperial College London**
First Class Honours (78.14)

Research Experience

2020-2024 **PhD project:** Intent-Driven Motion Synthesis for Simulated Wearable Robotics. Transfer insights from simulated to real prostheses and orthoses. Gait policy learning in environment simulated in MuJoCo. **First place presentation in my category at iCBEI22, article published in IEEE TNSRE.**

2021-2022 **Research paper:** Improving Robustness of Convolutional Predictive Models of Gait to EMG Variability. **Poster presented at EMBC 2022, article published in IEEE THMS.**

2019-2020 **Master's project:** Temporal Convolutional Network Based Trunk Muscle Signal Decoding for Exoskeleton Applications. Built data loading, systematic training and documentation systems. **Presented at BioMedEng22 Conference.**

2018-2019 **Year 3 group project:** Develop CNN-based, parallelised brain-cell counting algorithm. **Accepted at BioMedEng19.**

2023 **Literature reviews:** In topics of human stance control and upper limb rehabilitation exoskeletons, in preparation.

Work Experience

2025 - **Imperial College/Meta:** Postdoctoral researcher at the Wearable Neural Interfaces Research Centre. Developed neuromechanical models of the hand, and control policies using RL. Built fully forward muscle signal synthesis pipeline in massively parallelized simulated environments. Contributed to planning and writing grant applications.

2023-2025 **Google DeepMind:** Contractor to develop the Unity plugin for the open-source MuJoCo physics engine and provide community moderation and answers.

2023 **Artanim Foundation:** Paid research internship position. Investigated social spacing in virtual environments. Developed tools and processes for physics-based animation. Implemented interactive environments in VR. Planning and performing full-body, multi-actor motion capture sessions.

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2017-2024 **Teaching assistant:** Leading seminars and tutorials, creating and presenting lecture content, planning and grading coursework. Modules include Waves and Vibrations and Human Neuromechanical Control and Learning.

Skills

- **Technical skills:** Signal processing, Brain Machine Interfacing, Supervised and Reinforcement Learning (TF Keras and PyTorch), Gait analysis, Motion capture, App development
- **IT:** Python (+Jax), C#, Unity, Arduino, Blender, Git(Hub), C++
- **Med-device Entrepreneurship:** Modules about patents, IP, regulations (MDR) and tech transfer
- **Communication:** Experience as teaching assistant, PhD student society chair. **Designing and leading three-day workshop about simulation and neuromechanics at Summer School of Neurorehabilitation 2023 and 2024.**
- **Supervision:** Contributed to and advised student projects involving ankle exoskeleton control, tactile sensing, IMU based motion capture, EMG driven wheelchair, multi-agent RL

Interests and Successes

- Released an open-source RL-based locomotion learning toolkit, written interactive tutorials and contributed to open-source projects.
- Organizing team member for the NeurIPS 2024/25 competition MyoChallenge, developing simulated scenes for reinforcement learning in humanoid control tasks.
- Contributed peer reviews to multiple journals including IEEE TBME and Wearable Technologies.
- Organising committee member of CDT Prosthetics & Orthotics Conference 2021.
- Year 3 Dean's list, best poster award for year 3 project.
- Courses in creative writing, sound technology, philosophy.
- **Personal Projects:** Heart rate monitor, portable oscilloscope, programming video games, image processing app, worldbuilding
- Running, playing guitar, dragon boat paddling

Key publications

Hodossy, B.K. and Farina, D., 2023. Shared Autonomy Locomotion Synthesis With a Virtual Powered Prosthetic Ankle. IEEE Transactions on Neural Systems and Rehabilitation Engineering, 31, pp.4738-4748.

Hodossy, B.K., Guez, A.S., Jing, S., Huo, W., Vaidyanathan, R. and Farina, D., 2024. Leveraging high-density EMG to investigate bipolar electrode placement for gait prediction models. IEEE Transactions on Human-Machine Systems.