CS PhD Seminar Series

Nov 25th | 14:30-15:30 | Room 214

An introduction to interventional causal representation learning

Learning structured and disentangled representations from high-dimensional observations (e.g. images) has proved effective for interpretability, efficiency and fairness of deep learning models, most methods assume independent factors of variation. Causal Representation Learning (CRL) generalizes the disentanglement setting by considering potential causal relations between the latent causal variables. In this seminar I'll give an introduction to CRL when an intervention perturb the behavior of some causal variables, for example an agent interacting with an environment. Finally, I'll show some results of CRL applied to reinforcement learning evironments, where knowing the causal variable is fundamental for planning.

Speaker: Jacopo Dapueto

Jacopo Dapueto is a Ph.D. student in Computer Science at University of Genova. He received his B.S. degree in Computer Science at University of Genova in 2019 and M.S. in Computer Science at University of Genova in 2021. His research interests include computer vision and machine learning. Currently working at MaLGa under the supervision of Prof. Francesca Odone and Prof. Nicoletta Noceti.

Immersive Virtual Reality for Orthopedic Shoulder Rehabilitation

Virtual reality (VR) technologies are increasingly investigated in rehabilitation due to their ability to enhance patient participation, support remote care delivery, and promote standardization of therapeutic protocols. Current VR solutions are predominantly adapted from neurological applications and often lack integration with clinically validated protocols for shoulder rehabilitation. To address this gap, we presents the development and preliminary evaluation of an immersive VR system designed to support shoulder rehabilitation through personalized exercises. The system integrates a standardized rehabilitation protocol, guided by a virtual physiotherapist, and allows users to interact with a real-time feedback environment using the Meta Quest 3. Developed with Unity, the application features customizable options, including selectable avatars, virtual environments, and adaptive difficulty levels that align with clinical recovery stages.

Speaker: Andrea de Filippis

Andrea De Filippis is a second year PhD student in Computer Science at the University of Genoa–PILab (Perception&Interaction Lab). He earned his bachelor's degree in biomedical engineering and his master's degree in Bioengineering, both from the University of Genoa. His research focuses on the development and evaluation of immersive and semi-immersive virtual reality systems for motor and cognitive rehabilitation across various clinical contexts, with particular attention to Rett Syndrome and musculoskeletal disorders. He collaborates with Dialog Ausili and AIRETT (Italian Association for RETT syndrome) under the supervision of Professors Manuela Chessa, Fabio Solari, and Danilo Pani (University of Cagliari).