CMAI: Interface of Math and Artificial Intelligence Seminar
The Chinese University of Hong Kong

This CMAI Interface of Math and AI Seminar is organized by Centre for Mathematical Artificial Intelligence (CMAI), under Department of Mathematics at CUHK.

Date: May 22, 2024 (Wednesday)
Time: 3:00 pm-4:30 pm (Hong Kong Time)
Tencent Meeting: 216 645 305

The Invariant Representation Towards Trustworthy Artificial Intelligence

Speaker: Shuren Qi
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Abstract: Developing robust and interpretable vision systems is a crucial step towards trustworthy artificial intelligence (AI). In this regard, a promising paradigm considers embedding task-required invariant/symmetry structures in the data representation. Such methods, called invariant representations, have been widely investigated in the trustworthy fields like geometric deep learning, AI for science, security and forensic. Current community of invariant representations faces the following research challenges. At the theoretical level, classical invariants are based on global assumptions. As for more informative local and hierarchical invariants in computer vision, there is a challenge on corresponding theoretical expansion. At the practical level, classical invariants are often used in small-scale vision tasks. As for larger-scale vision tasks with symmetry prior, there is a challenge on corresponding practical expansion. In this talk, we will review previous research and present new methods for global, local, and hierarchical invariant representations, with their applications in security and forensic tasks.

Bio: Shuren Qi is currently pursuing the Ph.D. degree at Nanjing University of Aeronautics and Astronautics, Nanjing, China. He has published academic papers in top-tier venues including ACM Computing Surveys and IEEE TPAMI. His research involves the general topics of invariance, robustness, and explainability in computer vision. Currently, he is trying to give principled designs of invariant representations in global, local, and hierarchical senses, for closing today's trustworthiness gap in artificial intelligence. More details are available at https://shurenqi.github.io/