Special Issue

Rethinking Representation Learning in the Age of Large Models

Message from the Guest Editors

With rapid advances in AI, we have entered the era of large models—spanning large language models, multi-modal systems, and generative AI. As these powerful models shape the future, it becomes essential to rethink representation learning to ensure models are not only efficient but also robust, safe, and interpretable. This rethinking should be grounded in key principles such as causality and information theory, which provide solid foundations for building controllable and understandable models. Information theory plays a central role: maximizing entropy and preserving mutual information help models capture rich, diverse features. For example, contrastive learning implicitly encourages entropy maximization, while the information bottleneck principle promotes compact, task-relevant representations. By embracing these theoretical insights, we can push the boundaries of large models and expand their impact across tasks—from vision and language understanding to data generation. This Special Issue invites innovative methodologies and applications in representation learning for large models, particularly those guided by principled frameworks.

Guest Editors

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