Feature Learning for Cross-Domain Problems

Aim & Purpose:
Feature learning or representation learning is a set of techniques that allows a system to automatically discover the representations needed for feature detection or classification from raw data. This replaces manual feature engineering and allows a machine to both learn the features and use them to perform a specific task. Manual labeling of sufficient training data for diverse application domains is a costly, laborious task and often prohibitive. Therefore, advanced feature learning for cross-domain problems is highly desirable. In particular, domain adaptation or transfer learning algorithms seek to generalize a model trained in a source domain to a new target domain. The most common underlying assumption of many machine learning models is that both training and test data exhibit the same distribution or the same feature domains. However, in many real-life problems, there often exhibits a distributional feature space and/or dimension mismatch between source and target domains, or the statistical properties of the data evolve in time. Transferring and incorporating information from different available sources (such as learned feature extractors, knowledge of labeled and unlabeled instances, learned parameters among others from different domains into a unified model, etc.) to achieve human-level accuracy on a new task is of great importance. In this context, depending on the availability of the labeled and unlabeled training data from source and/or target domains, different scenarios can be considered, e.g., i) supervised, semi-supervised, or unsupervised domain adaptation, and ii) from shallow to deep models.

This special session targets researchers from different communities, including machine learning, computer vision and pattern recognition, and encourages novel theories and advanced techniques of feature learning for cross-domain problems. And it is also devoted to the publications of high quality papers on technical developments and practical applications. It will definitely assemble recent advances for cross-domain methods in the fields of machine learning, computer vision and pattern recognition, etc.

We invite original and high-quality submissions addressing all aspects of related fields. Relevant topics include, but are not limited to:

- Domain invariant feature learning / representation learning
- Learning with heterogenous features
- Transfer learning & Multi-task learning
- Structured learning
- Multi-instance learning
- Multi-view learning
- Deep learning
- Reinforcement learning
- Active learning
- Recommender systems
- Zero-, one- or few-shot learning
- Theoretical analysis

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