IJCNN 2024 SS Proposal

Title: Domain Adaptation for Complex Situations: Theories, Algorithms and Applications

Abstract: Domain adaptation aims to learn a model by training data such that the model can generalize well on test data, even if the training data and test data are from different distributions. Over the past few years, evidence of successful investigations on theoretical development and the use of domain adaptation to support many real-world applications have been witnessed, mainly on computer version but also on natural language processing, privacy protection, medical analysis and so on. It is instructive, vital and timely to offer a unified view of the current trends for the fundamental and applied research of domain adaptation to improve machine learning, data science and practical decision support systems. This special session aims to provide a forum for researchers in transfer learning to share the latest advantages in theories, algorithms, models and applications.

Keywords: Transfer learning, domain adaptation, cross-modality learning, source-free domain adaptation, inaccurate domain adaptation, incomplete domain adaptation.

Rationale: Domain adaptation is highly visible in both the machine learning theory and applications, which becomes a hot direction in artificial intelligence. In this session, we aim to share ideas in transfer learning relating to new theories, novel algorithms and their applications. The main topics of this special session include, but are not limited to, the following:

- New domain adaptation framework and theories
- Unsupervised/Semi-supervised domain adaptation
- Deep domain adaptation
- Multi-source/Multi-target domain adaptation
- Inaccessible source/target domain adaptation such as data-free domain adaptation
- Homogeneous/Heterogeneous domain adaptation
- Cross-modality transfer learning
- Incomplete domain adaptation such as open-set, partial and universal domain adaptation
- Domain generalization and out-of-distribution learning
- Few-shot domain adaptation
- Weakly supervised domain adaptation
- Complementary-label domain adaptation
- Applications in transport, healthcare, geosciences, business intelligence and more

Related special sessions previously organised: "Domain Adaptation for Complex Situations: Theories, Algorithms and Applications" in IJCNN 2023, "Transfer Learning under Weak Supervision" in IJCNN 2022. Accepted papers: 6-12 each year.

Organisers: Dr Keqiuyin Li is Postdoctoral Research Associate at Australian Artificial Intelligence Institute (AAII), University of Technology Sydney (UTS). She has published several papers related to transfer learning and fuzzy models in leading journals and conferences. (Keqiuyin.Li@uts.edu.au)

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Dr Zhen Fang is Lecturer at AAII, UTS. He has published several papers related to transfer learning and out-of-distribution learning in IJCNN, NeurIPS, AAAI, IJCAI, ICML, TNNLS, and TPAMI. (Zhen.Fang@uts.edu.au)

Professor Luis Martínez is Full Professor of Computer Science Department at the University of Jaén. His current research interests are fuzzy decision making, fuzzy systems, decision support systems, computing with words and recommender systems. (martin@ujaen.es)

Associate Professor Guangquan Zhang is an Australian Research Council (ARC) QEII Fellow, and the Director of the Decision Systems and e-Service Intelligent (DeSI) Research Laboratory at AAII, UTS. His main research interests lie in fuzzy multi-objective, bilevel and group decision

making, fuzzy measures, transfer learning and concept drift adaptation. He has published six authored monographs and over 500 papers including some 300 articles in leading international journals. (Guangquan.Zhang@uts.edu.au)

Distinguished Professor Jie Lu is an Australian Laureate Fellow, IFSA Fellow, and the Director of AAII at UTS, Australia. Her main research expertise is in transfer learning, concept drift, fuzzy systems, decision support systems and recommender systems. She has been awarded 12 Australian Research Council (ARC) discovery and linkage grants and led 20 industry projects. She has published over 500 papers in leading journals and conferences. (Jie.Lu@uts.edu.au)

Expected number of submissions: 8-15 papers.