IEEE Computational Intelligence Society Distinguished Lecturer Program

Speaker: Jie LU, University of Technology Sydney, Australia

Inviting Chapter: IEEE Computational Intelligence Society Thailand Chapter

Date: 15 June 2022

Number of Participants: 63 People

Lecture Title: Fuzzy Transfer Learning

Abstract:

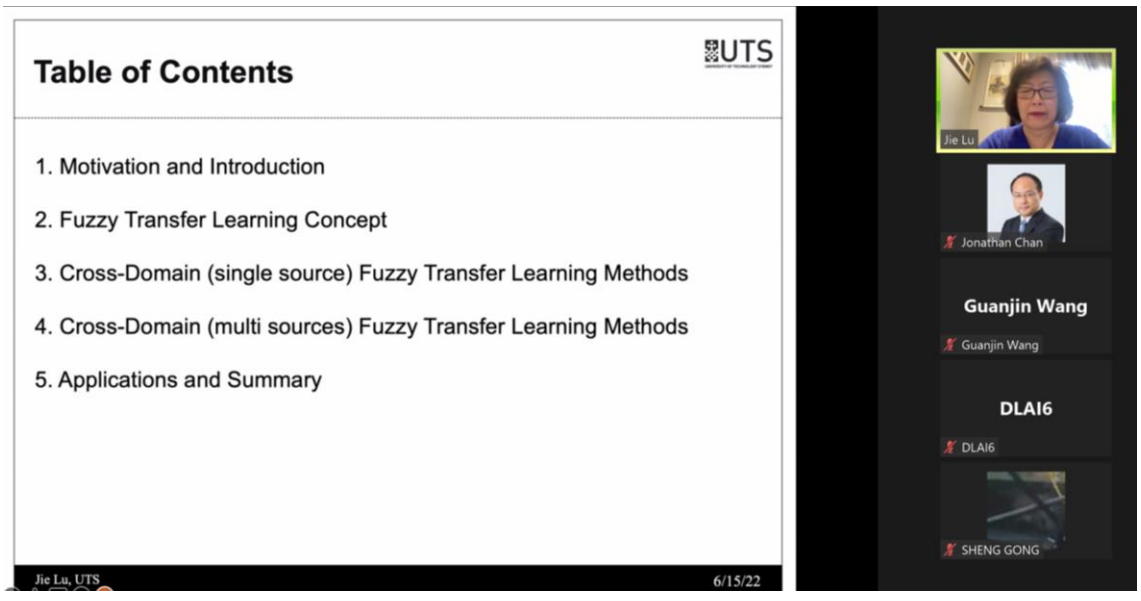
This talk will describe how fuzzy transfer learning can innovatively and effectively learn from data to support data-driven decision-making in uncertain and dynamic situations. The core idea behind fuzzy transfer learning is to leverage previously acquired knowledge to assist in completing a prediction task in a related domain by integrating fuzzy techniques with the transfer learning process. A set of new fuzzy transfer learning theories, methodologies, and algorithms is introduced, which transfers knowledge learned in one or more source domains to target domains. The fuzzy transfer learning set incorporates:

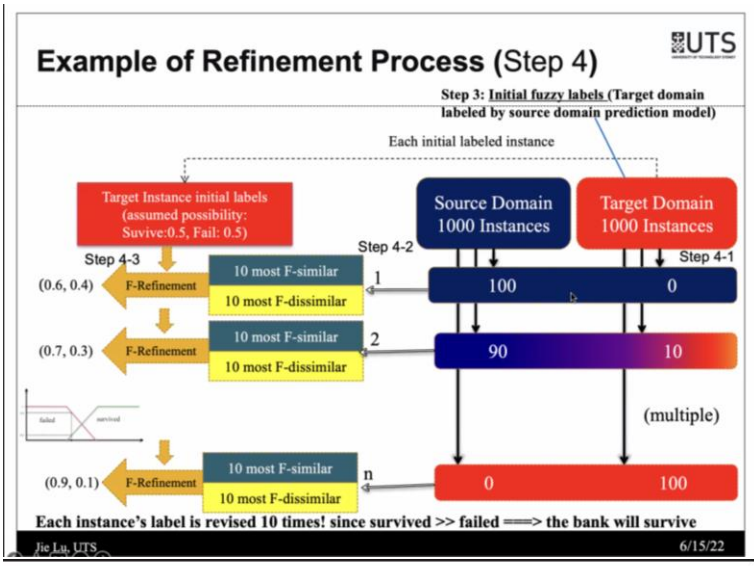
(1) a fuzzy refinement domain adaptation algorithm by utilizing the fuzzy system and similarity/dissimilarity concepts to modify the target instances' labels for classification; (2) fuzzy rule-based systems with mapping functions by building latent spaces to facilitate knowledge transfer for regression tasks in both homogeneous and heterogeneous scenarios; (3) unsupervised domain adaptation, to recognize newly emerged patterns in target domains that may be unlabelled. Patterns in target domains are recognized by leveraging knowledge from patterns learned from source domains and solutions to heterogeneous unsupervised domain adaptation via ndimensional fuzzy geometry and fuzzy equivalence relations. These new developments can enhance data-driven prediction and decision support systems in complex real-world environments.

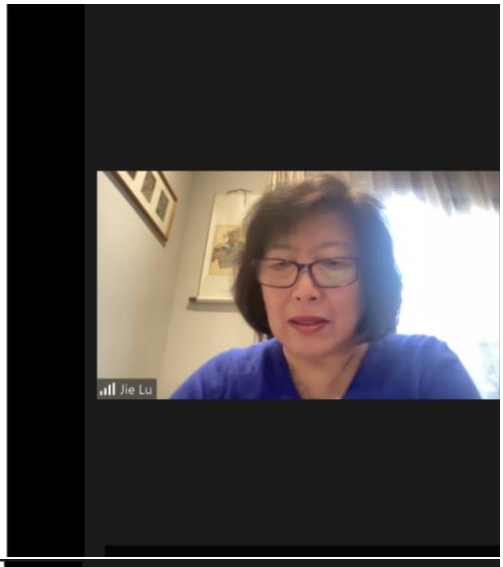
Website: https://deeplearningandaiwinterschool.github.io/#program

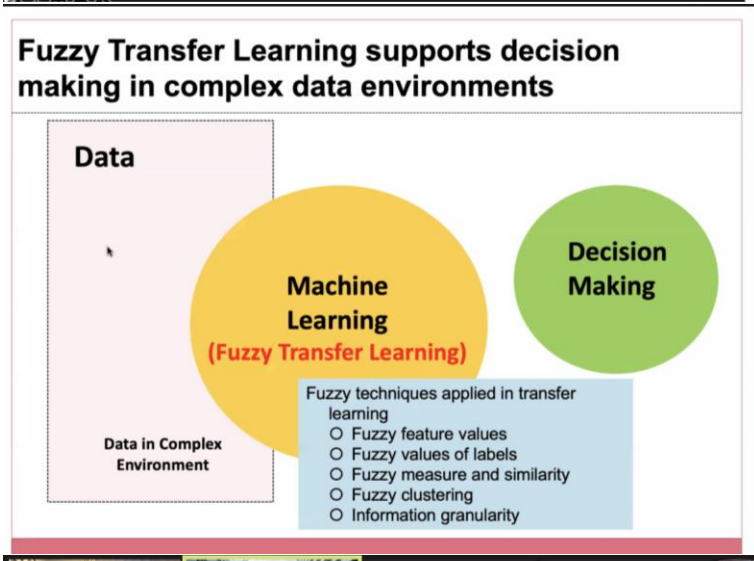
Day 2: Wed 15 Jun 2022 (ICT time UTC+7)

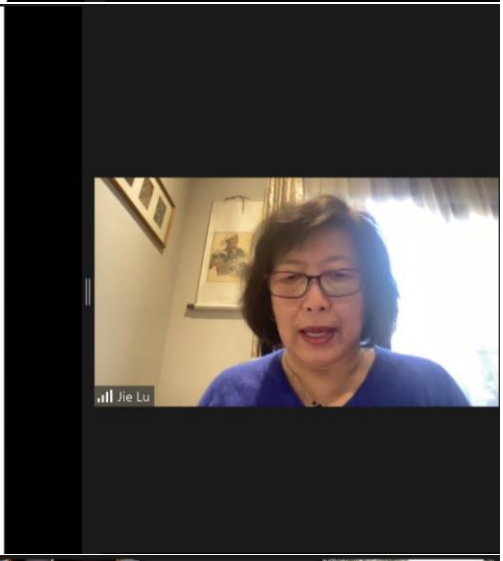
Time	Activity
IEEE-CIS Distinguished Lecturer Talk II	
08.00 - 09.00 am.	**Speaker:** *Jie LU*, University of Technology Sydney, Australia **Topic:** Fuzzy Transfer Learning
Academic Talk	
09.00 - 10.00 am.	**Speaker:** *Guanjin (Brenda) Wang*, Murdoch University, Australia **Topic:** Learning from imbalanced data and case studies in healthcare
Academic Talk	
10.00 - 11.00 am.	**Speaker:** *Jagdish Chand Bansal*, South Asian University New Delhi, India **Topic:** Drone Swarm: Concept, Challenges and Applications
11.00 am. - 12 noon	Lunch Break, Group Photo and Networking
IEEE-CIS Distinguished Lecturer Talk III	
12 noon - 01.00 pm.	**Speaker:** *Hisao Ishibuchi*, Southern University of Science and Technology, China **Topic:** Fair Performance Comparison of Evolutionary Multi-Objective Optimization Algorithms
Academic Talk	
01.00 - 02.00 pm.	**Speaker:** *M. Tanveer*, Indian Institute of Technology Indore, India **Topic:** Large Scale Machine Learning Algorithms and Applications to Alzheimer's Disease (bio)
Academic Talk	
02.00 - 03.00 pm.	**Speaker:** *Qi Sun*, *Bei Yu*, Chinese University of Hong Kong, Hong Kong, China **Topic:** Fast and Efficient Deep Learning Deployments via Learning-based Methods (Prof. Bei Yu's bio)
Academic Talk	
03.00 - 04.00 pm.	**Speaker:** *Lipo Wang*, Nanyang Technological University, Singapore **Topic:** Deep Learning for Image Classification
Academic Talk	
04.00 - 05.00 pm.	**Speaker:** *Chakarida Nukoolkit*, King Mongkut's University of Technology Thonburi, Thailand **Topic:** Data science concepts with case studies in health monitoring systems

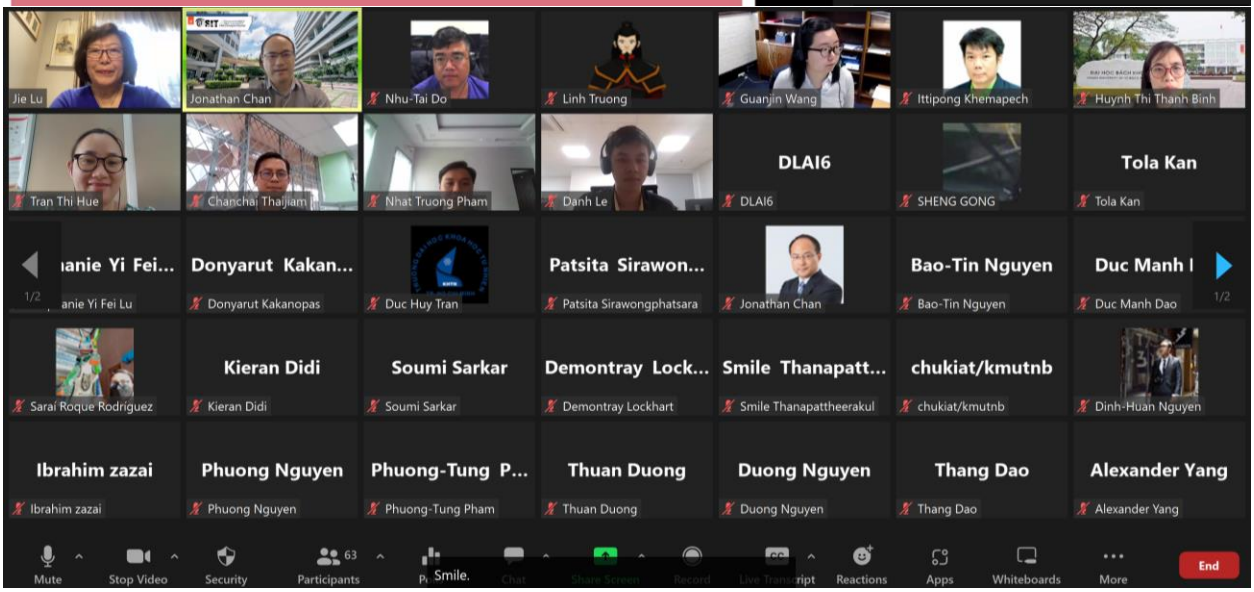



Example of Refinement Process (Step 4)
UTS
Step 3: Initial fuzzy labels (Target domain labeled by source domain prediction model)
Each initial labeled instance
Target Instance initial labels (assumed possibility: Suvive:0.5, Fail: 0.5)
Source Domain 1000 Instances
Target Domain 1000 Instances
Step 4-3
Step 4-2
Step 4-1
(0.6, 0.4)
F-Refinement
10 most F-similar
10 most F-dissimilar
1
100
0
(0.7, 0.3)
F-Refinement
10 most F-similar
10 most F-dissimilar
2
90
10
(multiple)
(0.9, 0.1)
F-Refinement
10 most F-similar
10 most F-dissimilar
n
0
100
Each instance's label is revised 10 times! since survived >> failed ====> the bank will survive
Jie Lu, UTS
6/15/22


Jie Lu


Fuzzy Transfer Learning supports decision making in complex data environments
Data
Machine Learning
(Fuzzy Transfer Learning)
Decision Making
Data in Complex Environment
Fuzzy techniques applied in transfer learning
Fuzzy feature values
Fuzzy values of labels
Fuzzy measure and similarity
Fuzzy clustering
Information granularity


Jie Lu


Jie Lu
Jonathan Chan
Nhu-Tai Do
Linh Truong
Guanjin Wang
Ittipong Khemapech
Huynh Thi Thanh Binh
Tran Thi Hue
Chanchai Thaijiam
Nhat Truong Pham
Danh Le
DLAI6
DLAI6
SHENG GONG
Tola Kan
Tola Kan
Donyarut Kakan...
Donyarut Kakanopas
Duc Huy Tran
Patsita Sirawon...
Patsita Sirawongphatsara
Jonathan Chan
Bao-Tin Nguyen
Bao-Tin Nguyen
Duc Manh Dao
Kieran Didi
Kieran Didi
Soumi Sarkar
Soumi Sarkar
Demontray Lock...
Demontray Lockhart
Smile Thanapatt...
Smile Thanapattheerakul
chukiat/kmutnb
chukiat/kmutnb
Dinh-Huan Nguyen
Ibrahim zazai
Ibrahim zazai
Phuong Nguyen
Phuong Nguyen
Phuong-Tung P...
Phuong-Tung Pham
Thuan Duong
Thuan Duong
Duong Nguyen
Duong Nguyen
Thang Dao
Thang Dao
Alexander Yang
Alexander Yang
Mute
Stop Video
Security
Participants
Smile.
Chat
Share Screen
Record
Reactions
Apps
Whiteboards
More
End