Harsha Kokel

harshakokel.com | hkokel@utdallas.edu | Work Authorization : F1

Education

University of Texas at Dallas [Fall '18 - present]
Ph.D., Computer Science, Advisor: **Prof. Sriraam Natarajan**

University of Texas at Dallas [Fall '17 - Spring'21]
M.S., Computer Science (GPA: 3.961), Advisor: **Prof. Sriraam Natarajan**

Dhirubhai Ambani Institute of ICT (DA-IICT), Gandhinagar, India [May '13]
B. Tech., Information and Communication Technology (GPA: 3.4), Advisor: **Prof. Prasenjit Majumder**
Thesis: Language identification for short text in transliterated space

Research Interest

Statistical Relational AI, Probabilistic graphical models, Reinforcement Learning, Planning, Causal inference, Knowledge-based systems, Graph Neural Networks, Neurosymbolic models.

Publications

[C5] **Kokel, H.**, Das, M., Islam, R., Bonn, J., et al. *Human-guided Collaborative Problem Solving: A Natural Language based Framework*, In **ICAPS (demo track) 2021**.

[W2] **Kokel, H.**, Manoharan, A., Natarajan, S., Balaraman, R., Tadepalli, P., *RePReL : Integrating Relational Planning and Reinforcement Learning for Effective Abstraction*, In **Planning and RL (PRL) Workshop** at **ICAPS 2021**. *(Contributed talk, 11/25 accepted paper)

[C4] Karanam, A., Hayes, A., **Kokel, H.**, Haas, D., Radivojac, P., Natarajan, S., *A Probabilistic Approach to Extract Qualitative Knowledge for Early Prediction of Gestational Diabetes*, In **AIME 2021**.

[C3] **Kokel, H.**, Manoharan, A., Natarajan, S., Balaraman, R., Tadepalli, P., *RePReL : Integrating Relational Planning and Reinforcement Learning for Effective Abstraction*, In **ICAPS 2021**.

[W1] Wan, G. and **Kokel, H.**, *Graph Sparsification via Meta-Learning*, In **Deep Learning for Graphs (DLG) Workshop** at **AAAI 2021**. *(Contributed talk, 4/22 accepted paper)

[C2] **Kokel, H.**, Odom, P., Yang, S., Natarajan, S., *Unified Framework for Knowledge Intensive Gradient Boosting: Leveraging Human Experts for Noisy Sparse Domains*, In **AAAI 2020**.

[C1] Sankepally, R., **Kokel, H.**, Agarwal, K., Majumder, P., *Morpheme Extraction Task at FIRE 2012-2013*, In Post-Proceedings of **FIRE 2012 and 2013**, ACM

Experience

Research Intern, *IBM T. J. Watson Research Center*, Yorktown Heights, NY, USA [Summer '21]
Marrying Symbolic Planning with Neural Reinforcement Learning.

Research Assistant, *Starling Lab, UT Dallas*, TX [Spring '19 - present]
Working on DARPA's Communicating with Computers grant and furthering BoostSRL, a relational functional gradient boosting framework.

Teaching Assistant, *UT Dallas*, TX [Fall '18]
CS6343 and CS4365, graduate and undergraduate level class of Artificial Intelligence.

ML Intern, *Turvo Inc.*, Sunnyvale, CA, USA [Summer '18]
Modeled cost estimator that learns from data and also leverages knowledge of the domain experts.

Senior Software Engineer, *Amadeus Software Labs*, Bangalore, India [Aug '16 - Jun '17]
Enhanced low fare search for Air Canada.

Associate Technology, *Publicis Sapient Consulting*, Bangalore, India [Jul '13 - Jul '16]
Provided content management solutions for digital transformation of business.

Research Assistant, *DA-IICT*, Gandhinagar, India [May '12 - May '13]
Worked on Sandhan, a cross lingual search engine for 8 Indian languages.

Technical skills

Python, PyTorch, Java, C, Shell, MATLAB, R, Prolog, PDDL, Linux/Unix, Git, SQL, JAX.

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Selected Projects

Generalization in RL for Transfer : Improving the generalization of deep RL agents by integrating it with relational planner. Specifically, capitalizing on the conditional independence of the domain to learn abstract representations that enable transfer in taskable domains.

Communicating with Computers (CwC): Working on developing a dialogue-based neuro-symbolic system for playing Blocks World in Minecraft simulator. The neural model parses the human instruction and symbolic planner provides the sequence of action required to execute the instruction. .

Knowledge-intensive Gradient Boosting: Improved learning of gradient boosted trees in case of sparse and noisy data by exploiting monotonic constraints from domain knowledge .

Relational Reinforcement Learning: Trying to reproduce the results from an ICLR paper where Graph Neural Networks are used to improve performance in relational domain.

Causal Learning for Protein Expression Data: Discovering causal molecular relationships from the evaluation of observational data using do-calculus.

RL for Healthcare: Learning polices for management of children on ECMO using batch reinforcement learning techniques.

Learning Sparse Graph for GNN: Used meta-learning techniques to optimize the graph structure of obtain sparse graph for GNN.

SRL model for credit default: Learnt and evaluated a statistical relational model for Kaggle Home credit default risk dataset and compared it with propositional models.

Expression detection: Project detects facial expression like wink and shush using OpenCV classifiers and image processing techniques.

JA-WALK-ER: Developed an interface that allows users with basic understanding of database to provide search bias for Inductive Logic Programming .

Academic Service

- Reviewed paper for Big Data .
- Assistant Electronic Publishing Editors for JAIR 2020 - present.
- Volunteered and Reviewed papers for AAAI 2021.
- Volunteered for ICDE 2020 as Session Host.
- Reviewed papers for CODS-COMAD, 2020 and SDM, 2020.
- Co-organized meeting of Forum for Information Retrieval Evaluation (FIRE), 2018 and 2013.
- Conducted a Workshop on Information Retrieval in Microsoft Research India & IRSI Pre-FIRE workshop, 2013.
- Co-organized Morpheme Extraction Task at FIRE.

Other Accomplishments

- Won Hackathon at Amadeus in November 2016
- Got Adobe Certification of AEM 6.0 Lead Developer in 2015
- Received Star of Bangalore, 2016 award at Sapient Nitro in recognition for best employee in the Bangalore branch
- Ranked among Top 5% performer of the batch in 2013 at Sapient
- Elected as Deputy Convener of the Cultural Committee in 2012-13 at DAIICT
- Elected as the first female student representative in the Disciplinary Action Committee at DAIICT for academic year 2012-13