

Shikha Singh

Senior PhD Candidate, Artificial Intelligence, IIT Madras

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Education

Indian Institute of Technology Madras

Ph.D. Computer Science and Engineering: CGPA: 8.8 ✍

Chennai, TN
expected 2021

Visvesvaraya National Institute Of Technology

M.Tech, Computer Science and Engineering: CGPA: 9.38 ✍

Nagpur, MH
May 2016

Uttar Pradesh Technical University

B.Tech, Computer Science and Engineering: 81.18% (4059/5000) ✍

Lucknow, UP
June 2014

Air Force School

All India Senior School Certificate Examination: 89.2% (446/500)

All India Secondary School Examination: 94.2% (471/500)

Gorakhpur, UP
May, 2009
May, 2007

Research Experience

Planning with Higher-Order Subjective Knowledge in Multi-Agent Scenarios

IIT Madras

- Used logic-based techniques to model “Theory of Mind” in agents.
- Implemented an AI planning framework to study an agent’s behaviour in collaborative and adversarial scenarios.
- Observed agents synthesizing deceptive plans to alter beliefs of other agents in uncontrolled domains.

Reasoning about Knowers and Knowability in Open Dynamic Domains

IIT Madras

- Formalized the novel idea of expressing higher-order knowledge about knowing a knower.
- Proposed a procedure to evolve the mental models of existing agent(s) to reflect the presence of newly discovered agent(s) and their beliefs.

Reasoning about Ramifications in Possible Worlds

IIT Madras

Described an approach to enrich “knowledge-based explanations” with “inference-based explanations” with an explicit representation of ramifications in multi-agent dynamic domains.

Optical Character Recognition for Multilingual Document Indexing ✍

VNIT Nagpur

Provided an automated solution for indexing of multilingual text from the scanned documents having English, Devanagari, and Marathi scripts by designing an OCR that uses the primitives of geometric boundaries of characters.

Analysis of Performance of Biometric Systems Based on Human Emotions

FGIET Raebareli

Studied the (then) SOTA Emotion Recognition Systems built from the facial images of people and their applicability towards building robust Biometric systems.

Relevant Courses



- Machine Learning: Regression, Classification & Clustering techniques, LDA, PCA, Ensemble methods, Boosting and Bagging, SVM, NLTK
- Deep Learning: CNNs, RNNs: LSTMs/Bi-LSTMs (plus Attention architecture), RBM, GANs
- Indexing & Searching in Large Databases: Memory-based vs Disk-based index structures for Graph data indexing and processing
- Pattern Recognition, Data Mining, Soft-Computing techniques
- Theory & Applications of Ontologies, Knowledge Representation and Reasoning

Leadership Experience

Teaching Fellow: Led programming-assignment setting, demonstration and evaluation; supervised students in course projects in around 7 different undergraduate-master level courses offered at IIT Madras, IIT Mandi and VNIT Nagpur.

Teaching Assistant (National Programme for Technology Enhanced Learning): [AI Domain] Search Methods in Problem Solving, Knowledge Representation and Reasoning, Constraint Satisfaction Problems

Organizing Committee

- The Second Summer School on Representation in Artificial Intelligence (RinAI-2019) 
- The IIT Mandi Summer School on Representation in Artificial Intelligence (RinAI-2017) 

Skills

- C, C++, Java, Python, PL/SQL, Matlab, R
- TensorFlow, Keras, scikit-learn, OpenCV, Matplotlib, NLTK, SciPy, Numpy, Pandas
- Linux, Git, Microsoft Azure, Prolog, Haskell, PDDL
- Microsoft Certified: Azure AI Fundamentals

Publications

1. **Shikha Singh** and Deepak Khemani (To appear as a student abstract in the proceedings of AAAI 2021). ***Mental Actions and Explainability in Kripkean Semantics: What Else do I Know?***
2. **Shikha Singh** and Deepak Khemani (2020). ***Planning with Subjective Knowledge in a Multi-Agent Scenario***. In 11th Hellenic Conference on Artificial Intelligence (SETN 2020), September 24, 2020, Athens, Greece. ACM, New York, NY, USA.
3. **Singh, S.**, and Khemani, D. (2019). ***Planning to deceive in a multi-agent scenario***. In M. T. Cox (Ed.), Proceedings of the Seventh Annual Conference on Advances in Cognitive Systems (pp. 473-491). Tech. Rep. No. COLAB2-TR-4. Dayton, OH: Wright State University, Collaboration and Cognition Laboratory.
4. **Singh, S.** and Khemani, D. (2019). ***Deception: An Epistemic Planned Event?*** Extended Abstract in Logic and Cognition Workshop, Eighth Indian Conference on Logic and Its Applications. Delhi, India.
5. Khemani, D. and **Singh, S.** (2018). ***Contract Bridge: Multi-agent Adversarial Planning in an Uncertain Environment***. Poster Collection of the Sixth Annual Conference on Advances in Cognitive Systems (pp. 161-180). Stanford, CA: ACS