Tulika Saha

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Objective

- I wish to work in an organization that provides space to learn and gain experiences in the field of Machine Learning or Natural Language Processing. I aim to capitalize on these experiences to drive my career forward.

Profile Summary

- Pursuing Ph.D. (Senior Research Fellow) in the area of End to End Task-Oriented Dialogue Systems under the supervision of Dr. Sriparna Saha and Prof. Pushpak Bhattacharyya from I.I.T Patna
- Possess comprehensive knowledge of subjects like Machine Learning, Deep Learning, Reinforcement Learning, Analysis and Design of Algorithms, Operating Systems etc. and practical exposures on topics such as Natural Language Processing, Information Retrieval and Multi-modal classification.

Education

2016 – Present — **Ph.D.(Computer Science & Engineering)**, Indian Institute of Technology Patna (IITP)

2014 – 2016 — **M.Tech. (Software Engineering)** with 8.81 CGPA, National Institute of Technology Durgapur (NITD)

2010 – 2014 — **B.Tech (Computer Science & Engineering)** with 8.54 CGPA, Narula Institute of Technology, Kolkata.

Thesis and Proposed Works

- Ph.D. thesis mainly focuses on developing end to end task-oriented dialogue systems in multilingual and multi-modal framework.
- Independent focus is set on addressing all the primary modules of Dialogue System which includes Natural Language Understanding, Dialogue Management Strategy and Natural Language Generation using Deep Learning and Reinforcement Learning.
- Several multi-task framework have been developed such as to study the affect of emotion in Dialogue Act Classification, joint domain, intent and slot prediction etc.
- Several solutions have been devised to learn dialogue policies for Virtual Agents to handle multi-domain, multi-intent conversation in multilingual setting using MDPs and Semi-MDPs.
- Works have been extended to analyse the content on social media platform such as Twitter to model the task of Tweet Act Classification.

Research Publications

Journal Articles

1. Saha, T., Gupta, D., Saha, S. & Bhattacharyya, P. (2020a). A hierarchical approach for efficient multi-intent dialogue policy learning. *Multimedia Tools and Applications*. doi:10.1007/s11042-020-09070-7
2. Saha, T., Saha, S. & Bhattacharyya, P. (2020). Towards sentiment aided dialogue policy learning for multi-intent conversations using hierarchical reinforcement learning. *PLOS ONE*, *15*(7), 1–28. doi:10.1371/journal.pone.0235367
3. Saha, T., Gupta, D., Saha, S. & Bhattacharyya, P. (2020b). Emotion aided dialogue act classification for task-independent conversations in a multi-modal framework. *Cognitive Computation*. doi:10.1007/s12559-019-09704-5
4. Saha, T., Gupta, D., Saha, S. & Bhattacharyya, P. (2020c). Towards integrated dialogue policy learning for multiple domains and intents using hierarchical deep reinforcement learning. *Expert Systems with Applications*, 113650. doi:https://doi.org/10.1016/j.eswa.2020.113650

Conference Proceedings

1. Saha, T., Patra, A., Saha, S. & Bhattacharyya, P. (2020). Towards emotion-aided multi-modal dialogue act classification. In *Proceedings of the 58th annual meeting of the association for computational linguistics* (pp. 4361–4372). Online: Association for Computational Linguistics. https://www.aclweb.org/anthology/2020.acl-main.402
2. Saha, T., Saha, S. & Bhattacharyya, P. (2019). Tweet act classification : A deep learning based classifier for recognizing speech acts in twitter. In *2019 international joint conference on neural networks (ijcnn)* (pp. 1–8).
3. Saha, T., Srivastava, S., Firdaus, M., Saha, S., Ekbal, A. & Bhattacharyya, P. (2019). Exploring machine learning and deep learning frameworks for task-oriented dialogue act classification. In *2019 international joint conference on neural networks (ijcnn)* (pp. 1–8).
4. Saha, T., Gupta, D., Saha, S. & Bhattacharyya, P. (2018). Reinforcement learning based dialogue management strategy. In L. Cheng, A. C. S. Leung & S. Ozawa (Eds.), *Neural information processing* (pp. 359–372). Cham: Springer International Publishing.
5. Saha, T., Saha, S. & Bhattacharyya, P. (2018). Exploring deep learning architectures coupled with crf based prediction for slot-filling. In L. Cheng, A. C. S. Leung & S. Ozawa (Eds.), *Neural information processing* (pp. 214–225). Cham: Springer International Publishing.

Patents

1. Wabgaonkar, H. M., Sengupta, S. & Saha, T. (2018). Virtual agent with dialogue management system and method of training a dialogue management system.

Area of Interest

- Deep Learning, Reinforcement Learning and Natural Language Processing

Skills

Coding	Python, C, Java.
Deep Learning	Experienced in TensorFlow/Keras/scikit-learn etc.

Skills (continued)

Misc. ■ Academic research, Teaching assistant, LaTeX publication.

Miscellaneous Experience

2019 ■ Received **Microsoft Research Travel Grant** to travel and present a paper entitled : Exploring Machine Learning and Deep Learning Frameworks for Task-Oriented Dialogue Act Classification at the International Joint Conference on Neural Networks (IJCNN) 2019 at Budapest, Hungary in July, 2019.

2017 ■ Interned at **Accenture Research Lab, Bangalore** on **Dialogue Systems** for a period of 6 months from 1st August, 2017–30th January 2018.