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Palo Alto, California  
[Computer Science & Engineering \(SCSE\), NTU](#)  
Singapore ([On leave](#))

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*Nationality*   Canadian citizen, US permanent resident

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## CURRENT INTERESTS AND PROJECTS THAT I LEAD

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- Foundational Large Language Models (LLMs)
  - Pretraining and instruction tuning:
    - \* [xGen](#) ([code](#), [paper](#), [blog](#), [media](#), [CEO's endorsement](#))  
*Impact:* xGen is Salesforce's foundational model series, serving as the basis for other in-house LLMs like [CodeGen](#) and [xGen-MM](#) (multi-modal). It currently powers numerous production use cases in the [Sales and Service Clouds](#).
  - Contextual LLM:
    - \* [SFR-RAG](#) ([code](#), [paper](#), [blog](#), [media](#), [CEO's endorsement](#))  
*Impact:* SFR-RAG is a 9B LLM that has been instruction-tuned with an emphasis on context-grounded generation and minimizing hallucinations. It empowers [Agentforce's](#) RAG-based use cases across various industries, including finance and healthcare.
    - \* Inference acceleration for long context: [GemFilter](#) ([code](#), [paper](#))
    - \* [Context utilization](#), [Hallucination in Summarization](#), [FaithEval-QA](#), [OpenRAG](#)
  - LLM judge & generative reward modeling:
    - \* [SFR-Judge](#) ([code](#), [paper](#), [blog](#), [media](#))  
*Impact:* It empowers [Agentforce's](#) LLMs by providing reward feedback at different stages; it is also used in SF's [benchmarking efforts](#).
- LLM Reasoning
  - Factual chain of thought ([Chain of Knowledg](#), [Verify & Edit](#))
  - Learning to reason ([PRM](#))
  - Logical reasoning ([FOLIO](#), [P-FOLIO](#), [LogicLLM](#))
  - In-context learning ([LDP](#))
- Multi-modal Models:
  - CodeLLMs: [CodeT5](#), [CodeChain](#), [Personalized Distillation](#), [xCodeEval](#)
  - Text + Image: [ALBEF](#), [X-InstructBLIP](#), [DiffusionDPO](#)

- Text + Chart: [UniChart](#), [ChartInstruct](#), [ChartQA](#), [OpenCQA](#), [Chart2Text](#)
- LLM Benchmarking & Survey
  - CRM benchmarks for large, small and agentic LLMs ([link](#), [blog](#), [media](#))
  - Summarization & QA: [InstruSum](#), [DiverseSum](#), [DIVKNOWQA](#), [ContextualBench](#), [SummEdits](#), [RoSE](#), [SWiPE](#)
  - Survey & Recommendation: [Critical review of LLM Evaluation](#), [Data augmentation](#), [Open- vs. Closed-source LLMs](#), [Limitation of ChatGPT](#), [Multimodal RAG](#), [GPT-3 as Data Annotator](#), [LLM Contamination](#)

## PROFESSIONAL EMPLOYMENTS

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<b>Research Director</b> <i>Salesforce Research, Palo Alto, USA</i> <i>Leading efforts on foundation LLMs (<a href="#">xGen</a>, <a href="#">SFR-RAG</a>, <a href="#">SFR-Judge</a>)</i>	Aug'22 - present
<b>Associate Professor (tenured, on leave since Aug'22)</b> <i>Nanyang Technological University (NTU), Singapore</i> <i>Founder of NTU-NLP Group</i>	Mar'22 - present
<b>Senior Manager</b> <i>Salesforce AI Research, Singapore</i> <i>Founding manager of the lab</i>	Feb'19 - Aug'22
<b>Assistant Professor</b> <i>Nanyang Technological University (NTU), Singapore</i>	Aug'17 - Feb'22
<b>Research Scientist</b> <i>Qatar Computing Research Institute, Qatar</i>	Jan'14 - Jul'17
<b>Research &amp; Teaching Assistant</b> <i>University of British Columbia, University of Lethbridge</i>	Aug'06 - Dec'13
<b>Research Intern</b> <i>Microsoft Research</i>	Sep'10 - Nov'10
<b>Lecturer</b> <i>Islamic University of Technology, Bangladesh</i>	Jan'05 - Aug'06

## EDUCATION

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<b>Ph.D. (Computer science)</b> <i>University of British Columbia (UBC), Vancouver, Canada</i>	2008-2014
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“Discourse analysis of asynchronous conversations”

Thesis advisors: [Giuseppe Carenini](#) & [Raymond T. Ng](#)

Internal committee members: [Nando de Freitas](#) (now at Oxford/DeepMind) & [Rachel Pottinger](#)

External committee members: [Carolyn P. Rosé](#) (CMU) & [Amanda Stent](#) (Yahoo! Research)

**M.Sc. (Computer science)**

2006-2008

*University of Lethbridge (UofL), Alberta, Canada*

“Answer Extraction for Simple and Complex Questions”

Thesis advisor: [Yllias Chali](#)

Other committee members: Sajjad Zahir, Howard Cheng & Giuseppe Carenini (external)

**B.Sc. (Computer science)**

2001-2005

*Islamic University of Technology (IUT), Dhaka, Bangladesh*

CGPA: 4.97/5.00 (2nd in the class)

## **MAJOR HONORS AND AWARDS**

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- [Outstanding paper award at EMNLP](#)  
2024
- Nominated for NTU College of Engineering (CoE) Young Faculty Award (Research)  
2022 (Nominated by SCSE)
- Nominated for Nanyang Research Award (Young Investigator)  
2021 – 2022 (Nominated by SCSE)
- [NSERC Alexander Graham Bell Canada Graduate Scholarship<sup>1</sup> \(CGS-D\)](#)  
2010 – 2012                      \$35,000 CAD/Year
- [Four Year Fellowship \(UBC\)](#)  
2010 – 2013                      \$18,000 CAD/Year
- [Faculty of Science Graduate Studies Award \(UBC\)](#)  
2010 – 2013                      \$7,200 CAD/Year
- [Nominated for MIT Technology Review’s Innovators Under 35 \(Asia\)](#) 2017 – 2018
- Microsoft Research Excellent Intern, 2010
- Nomination for Governor General Gold Medal for Best MSc. Thesis (UofL), 2008
- David R. Cheriton Scholarship, University of Waterloo, 2008 [Declined]
- FS Chia Ph.D. Scholarship, University of Alberta, 2008 [Declined]
- First class 2nd in BSc, 5th in higher secondary (HSC) & 11th in secondary (SSC) merit lists

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<sup>1</sup>This award is given only to the top-ranked PhD students across Canada.

## KEYNOTES

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1. “Navigating the Challenges of AI Data: Real-World Dynamics, Synthetic Solutions, and Global Collaboration”, The GAIN AI Summit (Round Table), Riyadh, KSA, 12-14 Sep 2024
2. “Unleashing the Potential of LLMs through Task and Data Engineering”, Taming LLMs workshop @SIGDIAL-23, Prague, Czechia, Sep. 2023
3. “Unleashing the Potential of LLMs through Task and Data Engineering”, Foundations and Applications of Large-scale AI Models (LLMAI workshop at KDD), Aug. 2023
4. “Unleashing the Potential of LLMs through Task and Data Engineering”, KAUST Research Conference, Saudi Arabia, Aug. 2023
5. “Unleashing the Potential of LLMs through Task and Data Engineering”, QCRI LLM Seminar, Doha, Qatar, Sep. 2023
6. “Model, Task and Data Engineering for NLP”, International Conference on Natural Language Processing and Information Retrieval (NLPIR), Dec. 2022

## TUTORIALS AT INTERNATIONAL CONFERENCES

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1. NLP+Vis: NLP Meets Visualization, Shafiq Joty, Enamul Haque and Jesse Vig, **EMNLP-2023**, Oklahoma City, USA. (Slides)
2. NLP4Vis: Natural Language Processing for Information Visualization, Enamul Haque and Shafiq Joty, **IEEEVis-2022**, Oklahoma City, USA. (Slides)
3. Discourse Analysis and Its Applications, Shafiq Joty, Giuseppe Carenini, Raymond Ng, and Gabriel Murray, **ACL-2019**, Florence, Italy. (Slides)
4. Discourse Processing and Its Applications in Text Mining, Shafiq Joty, Giuseppe Carenini, Raymond Ng, and Gabriel Murray, **ICDM-2018**, Singapore. (Slides)
5. NLP for Conversations: Sentiment, Summarization, and Group Dynamics, Gabriel Murray, Shafiq Joty, and Giuseppe Carenini., **COLING-2018**, Santa Fe, New Mexico. (Slides)

## TEACHING EXPERIENCE

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Instructor, Nanyang Technological University (NTU)

2017 - 2022

- **Year 2021 - 2022:**

- (i) Term 1: CZ4045: Natural Language Processing (Lec, Tut); CZ2002: Object Oriented Design & Programming (Tut. & Lab)
- (ii) Term 2: CE-7455 (PhD level): *Deep Learning for NLP* (added meta learning and VAEs)

- **Year 2020 - 2021:**

- (i) Term 1: CZ4045: Natural Language Processing (*syllabus revised with deep learning*) (Lec, Tut); CZ2002: Object Oriented Design & Programming (Tut. & Lab)
- (ii) Term 2: CE-7455 (PhD level): *Deep Learning for NLP* (added multilingual NLP)

- **Year 2019 - 2020:**

- (i) Term 1: CZ3005: Artificial Intelligence (Lec, Lab, Tut); CZ1007:Data Structures & Algorithm (Tut. & Lab)
- (ii) Term 2: CE-7455 (PhD level): *Deep Learning for NLP* (*new offer*)

- **Year 2018 - 2019:**

- (i) Term 1: CZ3005: Artificial Intelligence (Lec, Lab, Tut), CZ1007:Data Structures & Algorithm (Tut. & Lab)
- (ii) Term 2: CZ3005: Artificial Intelligence (Lec, Lab, Tut)

- **Year 2017 - 2018:**

- (i) Term 1: CZ1007:Data Structures & Algorithm (Tutorial & Lab)
- (ii) Term 2: CZ3005: Artificial Intelligence (Lecture, Lab, & Tutorial)

**Teaching Assistant, University of British Columbia** 2008-2013

- Courses TAed: Grad NLP, Grad/Ugrad AI, Object Oriented Programming, Intro. to Comp.

**Teaching Assistant, University of Lethbridge** 2006-2008

- Courses TAed: Introduction to Computers.

**Lecturer, Islamic University of Technology** 2005-2006

- Courses Taught: Theory of computation, UNIX prog., Systems prog., OOP.

## **PATENTS**

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### **Issued/Published Patents**

1. Xuan-Phi Nguyen, **Shafiq Joty**, and Chu Hong Hoi., “[SYSTEMS AND METHODS FOR A TRANSFORMER NETWORK WITH TREE-BASED ATTENTION FOR NATURAL LANGUAGE PROCESSING](#)”, **US 2021/0049236 A1**, US Patent (2021).
2. Yifan Gao, Chu Hong Hoi, **Shafiq Joty** and Chien-Sheng Wu., “[SYSTEMS AND METHODS FOR EXPLICIT MEMORY TRACKER WITH COARSE-TO-FINE REASONING IN CONVERSATIONAL MACHINE READING](#)”, *Patent Nb: 16/863,999* **US2021/0174023 A1**, US Patent (2021).
3. Weishi Wang, **Shafiq Joty**, and Chu Hong Hoi., “[SYSTEMS AND METHODS FOR RESPONSE SELECTION IN MULTI-PARTY CONVERSATIONS WITH DYNAMIC TOPIC TRACKING](#) ”, *Patent Nb: 17/014,458* **US Patent**, Filing Date: September 8, 2020 (2020).
4. Samson Tan and **Shafiq Joty**., “[SYSTEMS AND METHODS FOR GENERATING NATURAL LANGUAGE PROCESSING TRAINING SAMPLES WITH INFLECTIONAL PERTURBATIONS](#)”, **US 2021/0173872 A1**, US Patent (2021).
5. Samson Tan and **Shafiq Joty**., “[SYSTEMS AND METHODS FOR CODE-MIXING ADVERSARIAL TRAINING](#)”, *Patent Nb:US20220164547A1* **US Patent**, Filing Date: January 15, 2021 (2021).

6. Yue Wang, Chu Hong Hoi, and **Shafiq Joty**, “[UNIFIED VISION AND DIALOGUE TRANSFORMER WITH BERT](#)”, *Patent Nb: 16/929,738* **US2021/0232773 A1**, US Patent (2021).
7. Karan Aggarwal, Swaraj Khadanga, **Shafiq Joty**, Louis Kazaglis, and Jaideep Srivastava, “[COMPUTER ARCHITECTURE FOR IDENTIFYING SLEEP STAGES](#)”, **US 2021/0023331 A1**, US Patent (2021).
8. Karan Aggarwal, Swaraj Khadanga, **Shafiq Joty**, and Jaideep Srivastava, “[USING CLINICAL NOTES WITH TIME SERIES DATA FOR ICU MANAGEMENT](#)”, *NTU REF: 2019-374* **US Patent**, (2020).
9. Amrita Saha, **Shafiq Joty**, and Chu Hong Hoi., “[SYSTEMS AND METHODS FOR NUMERICAL REASONING BY A PARTIALLY SUPERVISED NUMERIC REASONING MODULE NETWORK](#)”, *Patent Nb: 17/162,289* **US Patent**, Filing Date: 01/29/2021 (2021).
10. Yue Wang, Weishi Wang, **Shafiq Joty** and Chu Hong Hoi., “[SYSTEMS AND METHODS FOR CODE UNDERSTANDING AND GENERATION](#)”, *US20220382527A1* **US patent**, Filing Date: May 18, 2021 (2021).
11. Akhilesh Deepak Gotmare, Junnan Li, **Shafiq Joty** and Chu Hong Hoi., “[SYSTEMS AND METHODS FOR SEMANTIC CODE SEARCH](#)”, *US8301633B2* **US patent**, Filing Date: May 18, 2021 (2021).
12. Guangsen Wang, Samson Tan, **Shafiq Joty**, Gang Wu, Steven (Chu Hong) Hoi., “[BOTSIM: AN END-TO-END AUTOMATIC EVALUATION FRAMEWORK FOR TASK-ORIENTED DIALOG SYSTEMS](#)”, *70689.209PV01* **US patent**, Filing Date: Jan 20, 2022 (2022).
13. Hailin Chen, Amrita Saha, **Shafiq Joty** and Chu Hong Hoi., “[Learning Label Modular Prompts for Text Classification](#)”, *70689.220US01 (63/355,476)* **US patent**, Filing Date: Jun 17 (2022).
14. Hailin Chen, Amrita Saha, **Shafiq Joty** and Chu Hong Hoi., “[SYSTEMS AND METHODS FOR IN-CONTEXT LEARNING USING SMALL-SCALE LANGUAGE MODELS](#)”, *US18316969* **US patent**, Filing Date: May 17 (2023).
15. Le Xue, Ning Yu, Dongxu Li, Silvio Savarese, **Shafiq Joty**, Ran Xu, Caiming Xiong, Artemis Panagopoulou, Juan Carlos Niebles and Junnan Li, “[SYSTEMS AND METHODS FOR MULTI-MODAL LANGUAGE MODELS](#)”, *US20240370718* **US patent**, Filing Date: Feb 23 (2024).

#### **Filed/Pending Patents**

1. **Shafiq Joty**, Semih Yavuz, Yingbo Zhou, Caiming Xiong, Ye Liu and Rui Meng, “SYSTEMS AND METHODS FOR ENHANCED TEXT RETRIEVAL WITH TRANSFER LEARNING”, *US63557220* **US patent**, Filing Date: Feb 23 (2024).
2. Alex Fabbri, Philippe Laban, **Shafiq Joty**, Jason Wu, and Divyansh Agarwal, “SYSTEMS AND METHODS FOR DEFENDING AGAINST PROMPT LEAKAGE ATTACKS”, *US63635925* **US patent**, Filing Date: Apr 18 (2024).
3. Semih Yavuz, **Shafiq Joty**, Yingbo Zhou, Srijan Bansal and Hung-Ting Chen, “SYSTEMS AND METHODS FOR MULTI-DOCUMENT RETRIEVAL-AUGMENTED GENERATION”, *US63698423* **US patent**, Filing Date: Sep 24 (2024).

4. Xuan Phi Nguyen, **Shafiq Joty**, Austin Xu, Senthil Purushwalkam and Austin Xu, “SYSTEMS AND METHODS FOR A NEURAL NETWORK LANGUAGE MODEL”, *US63689485 US patent*, Filing Date: Aug 30 (2024).
5. Austin Xu, **Shafiq Joty** and Peifeng Wang, “SYSTEMS AND METHODS FOR AUTOMATIC EVALUATION OF LARGE LANGUAGE MODEL-GENERATED TEXT”, *US63695200 US patent*, Filing Date: Sep 16 (2024).
6. Yifei Ming, **Shafiq Joty**, and Xuan Phi Nguyen and Zhenmei Shi, “SYSTEMS AND METHODS FOR ACCELERATING LONG-CONTEXT LANGUAGE MODELS”, *US63696226 US patent*, Filing Date: Sep 16 (2024).
7. **Shafiq Joty** and Caiming Xiong and Yingbo Zhou and Semih Yavuz and Tong Niu, “SYSTEMS AND METHODS FOR RETRIEVAL-AUGMENTED GENERATION”, *US63700322 US patent*, Filing Date: Sep 27 (2024).
8. **Shafiq Joty** and Senthil Purushwalkam and Yifei Ming, “SYSTEMS AND METHODS FOR EVALUATING AND IMPROVING FAITHFULNESS OF LARGE LANGUAGE MODELS”, *US63697909 US patent*, Filing Date: Sep 30 (2024).
9. **Shafiq Joty** and David Wan, “SYSTEMS AND METHODS FOR TRAINING AND EVALUATING LONG-FORM SUMMARIZATION”, *US63707093 US patent*, Filing Date: Oct 30 (2024).
10. Xuan Phi Nguyen, Yifei Ming, ZIXUAN KE and **Shafiq Joty**, “SYSTEMS AND METHODS FOR A NEURAL NETWORK LANGUAGE MODEL”, *US63701382 US patent*, Filing Date: Sep 30 (2024).
11. Ye Liu, Rui Meng, Meghana Bhat, Semih Yavuz, **Shafiq Joty**, Caiming Xiong, Yingbo Zhou, “SYSTEMS AND METHODS FOR INTEGRATING RETRIEVERS AND LARGE LANGUAGE MODELS FOR ANSWER GENERATION”, *US18497395 US patent*, Filing Date: Jun 23 (2023).
12. Tong Niu, **Shafiq Joty**, Yingbo Zhou, Semih Yavuz, Wenting Zhao, Ye Liu, “SYSTEMS AND METHODS FOR QUESTION ANSWERING WITH DIVERSE KNOWLEDGE SOURCES”, *US18497395 US patent*, Filing Date: Sep 25 (2023).
13. Ye Liu, Rui Meng, Meghana Bhat, Semih Yavuz, **Shafiq Joty**, Caiming Xiong, Yingbo Zhou, “SYSTEMS AND METHODS FOR RETRIEVAL BASED QUESTION ANSWERING USING NEURAL NETWORK MODELS”, *US18497395 US patent*, Filing Date: Oct 30 (2023).
14. Le Xue, Ning Yu, Dongxu Li, Silvio Savarese, **Shafiq Joty**, Ran Xu, Caiming Xiong, Artemis Panagopoulou, Juan Carlos Niebles, “SYSTEMS AND METHODS FOR ZERO-SHOT CROSS-MODAL REASONING VIA UNI-MODAL PROJECTIONS TO LARGE LANGUAGE MODELS”, *US 63586073 US patent*, Filing Date: Sep 28 (2023).
15. Kung-Hsiang Huang, Alex Fabbri, **Shafiq Joty**, Jason Wu, Prafulla Kumar Choubey, Philippe Laban, “SYSTEMS AND METHODS FOR EVALUATING SUMMARIZATION MODELS”, *US63519201 US patent*, Filing Date: Aug 23 (2023).
16. Wojciech Kryscinski, Alex Fabbri, Caiming Xiong, **Shafiq Joty**, Jason Wu, Divyansh Agarwal, Philippe Laban, “SYSTEMS AND METHODS FOR FACTUAL NATURAL LANGUAGE PROCESSING”, *US63503701 US patent*, Filing Date: Sep 26 (2023).

17. Wojciech Kryscinski, Alex Fabbri, Caiming Xiong, **Shafiq Joty**, Jason Wu, Divyansh Agarwal, Philippe Laban, “Measuring LLM Ability at Factual Reasoning Through The Lens of Summarization”, *US63503701 US patent*, Filing Date: May 22 (2023).
18. Hailin Chen, Amrita Saha, Akash Gokul, Doyen Sahoo, **Shafiq Joty**, Henry Le , “CodeChain: Towards Modular Code Generation Through Chain of Self-revisions with Representative Sub-modules”, *US63585865 US patent*, Filing Date: Sep 27 (2023).
19. Amrita Saha, Hailin Chen, **Shafiq Joty**, Steven Hoi, “SYSTEMS AND METHODS FOR PERSONALIZED DISTILLATION FOR LARGE LANGUAGE MODELS”, *SFDC/P/104883/US/UTL/1 US patent*, Filing Date: Aug 23 (2023).
20. Yue Wang, Weishi Wang, **Shafiq Joty** and Chu Hong Hoi., “Retrieval-Augmented Patch Generation with CodeT5 for Automatic Program Repair”, *70689.220US01 (63/189,857) US patent*, Filing Date: Jul 19, 2022 (2022).
21. DING Bosheng, LIU Linlin, BING Lidong, NGUYEN Hai Thien, **Joty Shafiq**, MIAO Chunyan, Si LUO., “Method And Apparatus For Training A Text Tagging Model”, *202011075457.0. (NTU Ref: 2021-023) Chinese patent*, Filing Date: 9 October (2021).
22. Yingzhu Zhao, Chongjia Ni, Cheung-Chi Leung, **Shafiq Joty**, Eng Siong, and Bin Ma, “Speech Recognition System, Method, Apparatus And Device.”, *NTU Ref: 2021-077-01-CN Chinese patent*, Filing Date: 22 February (2021).
23. DING Bosheng, LIU Linlin, BING Lidong, **Joty Shafiq**, MIAO Chunyan, Si LUO., “Data Augmentation Method, Named Recognition Method, Equipment and Electronic Device”, *(NTU Ref: 2021-520) Chinese patent*, Filing Date: 15 January (2022).

## PEER-REVIEWED JOURNAL PAPERS

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\* Indicates co-lead author;

\*\* Most of the codes of my papers can be found in the [NTU-NLP](#) group page

### • NLP

1. Kung-Hsiang Huang, Hou Chan, Yi Fung, Haoyi Qiu, Mingyang Zhou, **Shafiq Joty**, Shih-Fu Chang, and Heng Ji, “[From Pixels to Insights: A Survey on Automatic Chart Understanding in the Era of Large Foundation Models](#)”, *IEEE Transactions on Knowledge and Data Engineering* **x:x**, (TKDE) (Dec, 2024).
2. Ansong Ni, Pengcheng Yin, Yilun Zhao, Martin Riddell, Troy Feng, Rui Shen, Stephen Yin, Ye Liu, Semih Yavuz, Caiming Xiong, **Shafiq Joty**, Yingbo Zhou, Dragomir Radev, and Arman Cohan., “[L2CEval: Evaluating Language-to-Code Generation Capabilities of Large Language Models](#)”, *In Transactions of ACL (TACL)*, (2024).
3. Lingzhi Wang, **Shafiq Joty**, Wei Gao, Xingshan Zeng, and Kam-Fai Wong, “[Improving conversational recommender system via contextual and time-aware modeling with less domain-specific knowledge](#)”, *IEEE Transactions on Knowledge and Data Engineering* **x:x**, (TKDE) (Dec, 2024).
4. Tasnim Mohiuddin and **Shafiq Joty**, “[Unsupervised Word Translation with Adversarial Autoencoder](#)”, *Computational Linguistics* **46:2**, (presented at ACL-2020) (Jun, 2020).



5. **Shafiq Joty** and Tasnim Mohiuddin, “[Modeling Speech Acts in Asynchronous Conversations: A Neural-CRF Approach.](#)”, *Computational Linguistics (Special Issue on Language in Social Media)* **44:4**, 859 - 894 (2018).
6. **Shafiq Joty**, Francisco Guzmán, Lluís Màrquez, and Preslav Nakov., “[Discourse Structure in Machine Translation Evaluation.](#)”, *Computational Linguistics*. **43:4**, 683–722 (Dec, 2017).
7. **Shafiq Joty**, Nadir Durrani, Hassan Sajjad, and Ahmed Abdelali., “[Domain Adaptation Using Neural Network Joint Model.](#)”, *Journal of Computer Speech and Language (Special Issue on Deep Learning for Machine Translation)*. **45:C**; **cs1.2016.12.006**, 161–179 (Sep, 2017).
8. Francisco Guzmán, **Shafiq Joty**, Lluís Màrquez, and Preslav Nakov., “[Machine Translation Evaluation with Neural Networks.](#)”, *Journal of Computer Speech and Language (Special Issue on Deep Learning for Machine Translation)*. **45:C**; **cs1.2016.12.005**, 180–200 (Sep, 2017).
9. **Shafiq Joty**, Giuseppe Carenini and Raymond Ng, “[CODRA: A Novel Discriminative Framework for Rhetorical Analysis.](#)”, *Computational Linguistics*. **41:3**, 385–435, MIT press (2015).
10. **Shafiq Joty**, Giuseppe Carenini and Raymond Ng, “[Topic Segmentation and Labeling in Asynchronous Conversations.](#)”, *Journal of AI Research*. **47**, 521-573 (2013).
11. Yllias Chali\*, Sadid Hasan\* and **Shafiq Joty\***, “[Improving graph-based random walks for complex question answering using syntactic, shallow semantic and extended string subsequence kernels.](#)”, *Information Processing and Management*. **47:6**, 843–855, Elsevier (2011).
12. Yllias Chali\*, **Shafiq Joty\*** and Sadid Hasan, “[Complex Question Answering: Unsupervised Learning Approaches and Experiments.](#)”, *Journal of AI Research*. **35**, 1-47 (2009). (I was a co-lead author of this paper.)

#### • Interdisciplinary

1. Dhakshenya Ardhithy Dhinakaran, Laura Martinengo, Moon-Ho Ringo Ho, **Shafiq Joty**, Tobias Kowatsch, Rifat Atun, Lorainne Tudor Car , “[Designing, developing, evaluating, and Implementing a Smartphone-delivered, rule-based CONVERsational agent \(DISCOVER\): a conceptual framework.](#)”, *JMIR mHealth and uHealth*. **35**, 1-38 (2022).
2. Althaf Marsoof, Andrés Luco, Harry Tan, and **Shafiq Joty**, “[Content-filtering AI systems—limitations, challenges and regulatory approaches.](#)”, *Information Communications Technology Law*. **35**, 1-38 (2022).
3. Hui Li, Mengting Xu, Sourav Bhowmick, **Shafiq Joty**, Changsheng Sun, and Jiangtao Cui, “[PIANO: Influence Maximization Meets Deep Reinforcement Learning](#)”, *IEEE Transactions on Computational Social Systems* , (IEEE TCSS) (Apr, 2022).
4. Xiangxi Shi, Jianfei Cai, Jiuxiang Gu, and **Shafiq Joty.**, “[Video Captioning with Boundary-Aware Hierarchical Language Decoding and Joint Video Prediction](#)”, *Neurocomputing* **417**, 347-356 (Dec, 2020).
5. Jing Ma, Wei Gao, **Shafiq Joty**, and Kam-Fai Wong, “[An Attention-based Rumor Detection Model with Tree-structured Recursive Neural Networks](#)”, *ACM Transactions on Intelligent Systems and Technology (TIST)* **11:04**, (42) (2020).

6. Lorainne Car, Dhakshenya Dhinakaran, Bhone Kyaw, Tobias Kowatsch, **Shafiq Joty**, Yin Theng, and Rifat Atun, “[Conversational agents in healthcare: a scoping review and conceptual analysis](#)”, *Journal of Medical Internet Research (JMIR)* **22:8**, (Aug, 2020).
7. Aarti Sathyanarayana, **Shafiq Joty**, Luis Fernandez-Luque, Ferda Ofli, Jaideep Srivastava, Ahmed Elmagarmid, Shahrads Taheri, and Teresa Arora., “[Sleep Quality Prediction From Wearable Data Using Deep Learning](#)”, *JMIR Mhealth Uhealth (JMU)* (4(4):e125), JMIR (2016).

## **PEER-REVIEWED CONFERENCE PAPERS [BY YEAR]**

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\* Indicates co-lead author;

\*\* Most of the codes of my papers can be found in the [NTU-NLP](#) group page

### **2024**

1. Fangkai Jiao, Chengwei Qin, Zhengyuan Liu, Nancy F. Chen, and **Shafiq Joty**., “[Learning Planning-based Reasoning by Trajectories Collection and Process Reward Synthesizing](#)”, In *Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP-2024)*, Miami, USA (2023). **Outstanding paper award.**
2. Mohammed Islam, Md Laskar, Md Parvez, Enamul Hoque and **Shafiq Joty**., “[DataNarrative: Automated Data-Driven Storytelling with Visualizations and Texts](#)”, In *Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP-2024)*, Miami, USA (2023).
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2. Yllias Chali and **Shafiq Joty**., “[University of Lethbridge’s Participation in TREC-2007 Main Task](#).”, *In Proceedings of the Sixteenth Text REtrieval Conference (TREC-2007)*, Gaithersburg, USA. (2007). (I was a co-lead author.)
3. **Shafiq Joty** and Sadid Hasan., “[Advances in Focused Retrieval: A General Review](#).”, *In Proceedings of the 10th IEEE International Conference on Computer and Information Technology (ICCIT-2007)*, pages 1-5, Dhaka, Bangladesh. (2007).

## PEER-REVIEWED WORKSHOP PAPERS

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1. Nafise Sadat Moosavi, Angela Fan, Vered Shwartz, Goran Glavas, **Shafiq Joty**, Alex Wang, and Thomas Wolf., “[Proceedings of SustaiNLP: Workshop on Simple and Efficient Natural Language Processing](#)”, In *Proceedings of SustaiNLP Workshop (EMNLP’20 SustaiNLP Workshop)*, Online (2020).
2. Dat Nguyen, **Shafiq Joty**, Basma Boussaha, and Maarten de Rijke., “[Thread Reconstruction in Conversational Data using Neural Coherence Models.](#)”, In *Proceedings of the Neu-IR 2017 SIGIR Workshop on Neural Information Retrieval (NeuIR’17)*, Tokyo, Japan (2017).
3. Alberto Barrón-Cedeño, Giovanni Da San Martino, **Shafiq Joty**, Alessandro Moschitti, Fahad Al-Obaidli, Salvatore Romeo, Kateryna Tymoshenko and Antonio Uva., “[ConvKN at SemEval-2016 Task 3: Answer and Question Selection for Question Answering on Arabic and English Fora.](#)”, In *Proceedings of the 10th International Workshop on Semantic Evaluation. (SemEval 2016)*, San Diego, USA (2016). (**2<sup>nd</sup> place in both English & Arabic subtasks of Task 3**)
4. Giovanni Da San Martino, Alberto Barrón-Cedeño, Salvatore Romeo, Alessandro Moschitti, **Shafiq Joty**, Fahad Al-Obaidli, Kateryna Tymoshenko, Antonio Uva and Daniele Bonadiman., “[Addressing Community Question Answering in English and Arabic.](#)”, In *Second WebQA workshop. (SIGIR-WebQA 2016)*, Pisa, Italy (2016).
5. Dat Tien Nguyen, **Shafiq Joty**, Muhammad Imran, Hassan Sajjad, and Prasenjit Mitra., “[Applications of Online Deep Learning for Crisis Response Using Social Media Information.](#)”, In *the 4th International Workshop on Social Web for Disaster Management (co-located with CIKM 2016), (SWDM 2016)*, Indianapolis, USA (2016).
6. Massimo Nicosia, Simone Filice, Alberto Barrón-Cedeño, Iman Saleh, Hamdy Mubarak, Wei Gao, Preslav Nakov, Giovanni Da San Martino, Alessandro Moschitti, Kareem Darwish, Lluís Màrquez, **Shafiq Joty** and Walid Magdy., “[QCRI: Answer Selection for Community Question Answering - Experiments for Arabic and English.](#)”, In *Proceedings of the 9th International Workshop on Semantic Evaluation. (SemEval-2015)*, pages 203-209, Denver, USA (2015). (**Winner in Arabic and 3<sup>rd</sup> place in English subtask of Task 3**)
7. **Shafiq Joty**, Francisco Guzman, Lluís Marquez and Preslav Nakov., “[DiscoTK: Using Discourse Structure for Machine Translation Evaluation.](#)”, In *Proceedings of the Ninth Workshop on Statistical Machine Translation (WMT-2014)*, pages 402-408, Baltimore, USA (2014). (**Winner of the metric task.**)
8. Enamul Hoque, Giuseppe Carenini and **Shafiq Joty.**, “[Interactive Exploration of Asynchronous Conversations: Applying a User-centered Approach to Design a Visual Text Analytic System.](#)”, In *Proceedings of the Workshop on Interactive Language Learning, Visualization, and Interfaces (ILLVI-2014)*, pages 45-52, Baltimore, USA. (2014).
9. Wei Jin, **Shafiq Joty**, Giuseppe Carenini and Raymond Ng., “[Detecting Informative Blog Comments using Tree Structured Conditional Random Fields.](#)”, *The Pacific Northwest Regional NLP Workshop (NWNLP-2012)*, Microsoft Research, Redmond, USA. (2012).
10. **Shafiq Joty**, Giuseppe Carenini, Gabriel Murray and Raymond Ng., “[Finding Topics in Emails: Is LDA enough?](#)”, *NIPS-2009 workshop on applications for topic models: text and beyond. (NIPS-2009)*, Whistler, Canada (2009).

11. Yllias Chali and **Shafiq Joty.**, “[Word Sense Disambiguation Using Lexical Cohesion.](#)”, *In Proceedings of the 4th International Conference on Semantic Evaluations (SemEval-2007)*, pages 476-479, Prague, Czech Republic. (2007).

## RESEARCH GRANTS

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1. Language Model Adaptation for Low-Resource Languages and Dialects., “Ministry of Education (MOE) Tier-2”, 713,000 SGD (Feb, 2023 – Feb, 2026).
2. NLP for WHO’s Workforce Intelligence., “WHO International”, 375,000 USD (Dec, 2021 – Oct, 2022).
3. Trustworthy and Explainable AI: Text Data Augmentation, Multi-Lingual NLP Generation., “AISG2-PhD-2021-01-001”, 480,000 SGD (Jan, 2021 – Sep, 2025).
4. Inference Capable Natural Language Generation for Conversational AI., “AI.SG 100ER”, 400,000 SGD (Sep, 2021 – Aug, 2023).
5. Zero-shot and few-shot learning for NER with/without a small In-domain KB., “Alibaba-NTU Singapore Joint Research Institute”, 136,104 SGD (Nov, 2020 – Nov, 2021).
6. AI-supported collaborative activity design., “AI.SG 100 Experiments”, 180,665.76 SGD (Apr, 2020 – Sep, 2021).
7. Customised Tamil-English Translation Engine., “Joint Project with A-star”, 149,400 SGD (Sep, 2019 – Apr, 2021).
8. Knowledge Graph Mining for Educational Domain., “Delta-NTU-NRF”, 199,964 SGD (Jan, 2020 – Dec, 2021).
9. Language Understanding and Generation with Deep Neural Networks., “Start Up-Grant (NTU, Singapore)”, 200,000 SGD (Jul, 2017 – Jul, 2020).
10. Multilingual Language Processing Using Generative Adversarial Autoencoders., “Tier-1 program (NTU, Singapore)”, 100,000 SGD (Mar, 2018 - Aug, 2019).
11. A Malay-English Translation System., “SCSE demo fund (NTU, Singapore)”, (Jan, 2018 – Jun, 2018).

## INVITED TALKS

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1. “[Unleashing the Potential of LLMs through Task and Data Engineering](#)”, [University of California Santa Cruz](#), Santa Clara, CA, USA, Jun. 2024
2. “[Unleashing the Potential of LLMs through Task and Data Engineering](#)”, [VISA Research](#), Foster City, CA, USA, Nov. 2023
3. “Novel Data and Task Engineering Methods for NLP”, Baidu Research Speaker Series, Baidu Research, May. 2022
4. “[Model, Data and Task Engineering for NLP](#)”, University of California Santa Cruz , UCSC seminar, Apr. 2022

5. [“Model, Task and Data Engineering for NLP”](#), Open Data Science Conference (ODSC), APAC Region, Sept. 2021
6. “Model, Task and Data Engineering for NLP”, Tech Talk (Topic AI and NLP) at IIT Roorkee, Hyderabad, BHU, KGP, Delhi, Guwahati, Kanpur, ISM Dhanbad, Salesforce, Aug, 2021
7. “Panel Discussion - Get Started with AI Startups”, International Student Conference On Artificial Intelligence (STCAI, NTU), Aug, 2021,
8. “Model, Task and Data Engineering for NLP”, UBC, Canada, June. 2021
9. “Model, Task and Data Engineering for NLP”, York University, Canada, June. 2021
10. “Model, Task and Data Engineering for NLP”, SEA AI Lab, Singapore, June. 2021
11. [“Model, Task and Data Engineering for NLP”](#), NUS, Singapore, June. 2021
12. “Towards Robust Multi-lingual Multi-dialectal NLP Models”, Alibaba Damo Academy, Singapore, Mar. 2021
13. [“A Rights-Based Approach to the Design and Use of AI”](#), Algorithmic Justice Knowledge Sharing Session,, NBS Communications, Webinar, Nov 2020
14. “NLP Research at NTU-NLP”, Alibaba NTU JRI, Online, Nov. 2020
15. [“Panel Discussions: Ethics in AI”](#), The 2019 Singapore Symposium on Natural Language Processing, SSNLP-2019, Nov. 2019
16. “Discourse Analysis with Deep Learning”, TU-Darmstadt, Germany, July. 2019
17. “Deep Structured Models for Natural Language Processing”, NTU-WeBank Training Program, NTU, Singapore,, Jun. 2019
18. “Deep Structured Models for Natural Language Processing”, IET x MLDA@EEE NLP Workshop, NTU,, NTU, Singapore,, Apr. 2019
19. “Structured Models for Discourse Analysis and NLP Applications ”, Alibaba, Singapore, Jan. 2019
20. [“Deep Structured Models for Natural Language Processing”](#), NTU-SenseTime Research Seminar, NTU, Singapore, Nov. 2018
21. “Deep Structured Models for Natural Language Processing ”, Salesforce AI Research, Palo Alto, USA, Oct. 2018
22. “Deep Learning for Multilingual and Multimodal Processing”, DSO National Laboratories, Singapore, Oct. 2018
23. [“Deep Learning for Multilingual and Multimodal Processing”](#), Industry-NTU Dialogue: AI Research, Innovation and Talent, NTU, Singapore, Sep. 2018
24. “Discourse Analysis and Its Applications”, Gwangju Institute of Science and Technology (GIST), South Korea, Dec. 2017



25. “How Computational Linguistics can help Computational History”, Johannesburg Institute for Advanced Study (JIAS), Johannesburg, South Africa, Nov. 2017
26. “Discourse Analysis and Its Applications”, National University of Singapore (NUS), Singapore, Oct. 2017
27. “Discourse Analysis and Its Applications”, Institute for Infocomm Research A\*Star, Singapore, Sep. 2017
28. [“Structured Predictions for Discourse Analysis and Applications in Natural Language Processing”](#), Singapore University of Technology and Design (SUTD), Singapore, Sep. 2017
29. “Structured Predictions for Discourse Analysis and Applications in Natural Language Processing”, University of Calgary, Calgary, Canada, Mar. 2017
30. “Structured Predictions for Discourse Analysis and Applications in Natural Language Processing”, University of Waterloo, Waterloo, Canada, Feb. 2017
31. “Structured Predictions for Discourse Analysis and Applications in Natural Language Processing”, Nanyang Technological University (NTU), Singapore, Nov. 2016
32. “Introduction to Machine Learning”, Global Entrepreneurship Week, Doha, Nov. 2015
33. “Discourse Analysis & its Applications”, Chinese University of Hong Kong., Oct. 2015
34. “CODRA: A Complete Discriminative Framework for Rhetorical Analysis”, Universite Paul Sabatier, Toulouse, France., Sep. 2014
35. “Discourse Analysis of Asynchronous Conversations”, University of British Columbia, Vancouver, Canada., Dec. 2013
36. “Intra- and Multi-sentential Rhetorical Parsing for Document-level Discourse Analysis”, NSERC Business Intelligence Network AGM, IBM Software Labs, Canada., Nov. 2012
37. “A Novel Discriminative Framework for Sentence-Level Discourse Analysis”, NW-NLP workshop, Microsoft Research Redmond., May, 2012
38. “Discourse Analysis of Asynchronous Conversations (e.g., emails, blogs)”, Business Intelligence (BI) Workshop-NSERC BIN Watson, IBM Watson center, Feb, 2012
39. “Discourse Analysis of Asynchronous Conversations (e.g., emails, blogs)”, UBC Social Network Group, Feb, 2012
40. “Unsupervised Modeling of Dialog Acts in Asynchronous Conversations”, UBC Laboratory for Computational Intelligence (LCI) Forum Talk, Apr, 2011
41. “Topic and Dialog Act Modeling of Asynchronous Conversations”, Microsoft Research Asia, Nov, 2010
42. “What are they talking about?” Finding Topics in Email Conversations”, UBC Laboratory for Computational Intelligence Forum (LCI) Talk, Feb, 2010
43. “Answering Simple and Complex Questions”, University of Alberta NLP Group, Jan, 2008

## SERVICE

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1. **PC co-chair:** SIGDIAL-2023
2. **Best paper award committee:** NAACL-22, ICLR-23
3. **Senior area chair:** [EMNLP-2023](#) (Discourse) [ACL-2022](#) (ML), [EMNLP-2021](#) (Applications)
4. **Area chair:** [ICLR-2024](#) (NLP), [NeurIPS-2023](#) (NLP), [ICLR-2023](#) (NLP), [ACL-2023 EMNLP-2022](#) (Discourse), [COLING-2022](#) (Discourse), [ACL-2021](#) (ML), [ACL-2020](#) (Discourse), [NAACL-2021](#) (Discourse), [ACL-2019](#) (QA), [EMNLP-2019](#) (Discourse)
5. **Action editor:** [ACL rolling review](#) [2021 - present]
6. **Associate editor:** ACM Transactions on Asian and Low Resource Language Resource language Processing (TALLIP) [Jan 2020, Feb 2021]
7. **Senior Program Committee member:** [IJCAI-2019](#), AAAI-2020
8. **Journal/Conference Reviewing:** TACL [2015-2019], ACL/EMNLP/SigDial/\*SEM/NAACL/IJCAI/IUI/K [2008 - present]
9. **Grant Proposal Reviewing:** [NSERC Canada Discovery Grant](#) [2018], Israel Science Foundation (ISF) [2021].
10. Organizing committee member of EMNLP-2014, ICCIT-2005.
11. Associate VP position in the Bangladesh Students' Association, UBC (2009-2010).

## PROFESSIONAL MEMBERSHIP

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- ACL, SIGDAT, SIGGEN, SIGSEM, ACM, IEEE.

## STUDENTS

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### • Current PhD Students

1. [Li Xingxuan](#) [Aug, 2021 - Present, EDB IPP]
2. [Fangkai Jiao](#) [Aug, 2022 - Present, A\*Star SINGA]

### • Thesis Submitted

1. [Esther \(Ruochen\) Zhao](#) [Jan, 2021 - Present, AISG Fellowship]
2. [Chen Hailin](#) [Jan, 2021 - Present, Salesforce IPP NTU]
3. [Chengwei Qin](#) [Jan, 2021 - Present, NTU Graduate Scholarship]



## • Graduated Students (PhD)

1. [Nguyen Thanh Tung](#) [Aug, 2017 - Jul, 2021]  
First Employment: Research Scientist, I2R A-star, Singapore  
**PhD Thesis:** “Pointing Network for Natural Language Understanding”
2. [Tasnim Mohiuddin](#) [Jan, 2018 - Dec, 2021]  
First Employment: NLP Researcher, Huawei Research Center, Singapore  
**PhD Thesis:** “Neural Machine Translation with Limited Resources” (1st runner up for best thesis award 2022 - 2023)
3. [Samson Tan \(industry advisor\)](#) [Aug, 2019 - Mar, 2022, Salesforce IPP NUS] [NUS Dean’s Research Excellence Award 2021, Research Achievement Award, 2020](#)  
First Employment: Applied Scientist at AWS AI Research Education, Santa Clara, USA  
**PhD Thesis:** “Linguistically-inclusive Natural Language Processing”
4. [Prathyusha Jwalapuram](#) [Aug, 2018 - Jul, 2022] [A\\*STAR International Fellowship \(AIF\)](#)  
First Employment: Research Scientist, Rakuten, Singapore  
**PhD Thesis:** “Building Generalizable Models for Discourse Phenomena Evaluation and Machine Translation”
5. [Saiful Bari](#) [Jan, 2019 - Dec, 2022] [NTU Graduate Scholarship](#)  
First Employment: Senior Research Scientist, Saudi Data & AI Authority (SDAIA), KSA  
**PhD Thesis:** “Transfer Learning for Language Model Adaptation”
6. [Lin Xiang](#) [Jan, 2019 - Dec, 2022]  
First Employment: Quantitative/NLP Researcher, GIC, Singapore  
**PhD Thesis:** “Natural Language Processing as Autoregressive Generation”
7. [Han-Cheol Moon](#) [PhD, Aug, 2019 - Jul, 2023] [SINGA-SINGA fellowship](#)  
First Employment: ML engineer, Samsung Research, South Korea  
**PhD Thesis:** “Toward Robust Natural Language Systems”
8. [Linlin Liu \(co-supervision\)](#) [PhD, Jan, 2019 - Dec, 2022] [Alibaba-NTU IGS fellowship](#)  
First Employment: Data Scientist, Cubist Systematic Strategies, Singapore  
**PhD Thesis:** “Towards Robust Natural Language and Image Processing in Low-Resource Scenarios”
9. [Xuan Phi Nguyen](#) [PhD, Aug, 2019 - Mar, 2023] [SDSC dissertation fellowship, A\\*STAR ACIS fellowship](#)  
First Employment: Research Scientist (Ali Star), DAMO Academy, Alibaba, Singapore  
**PhD Thesis:** “Improving Neural Machine Translation: Data Centric Approaches”
10. [Bosheng Ding \(co-supervision\)](#) [Jan, 2020 - Apr, 2024] [Alibaba-NTU fellowship](#)  
**PhD Thesis:** “Advancing Low Resource Information Extraction and Dialogue System Using Data Efficient Methods”

11. [Mathieu Ravaut](#) [PhD, Jan, 2021 - Jul, 2024] [SDSC dissertation fellowship, A\\*Star RSS-SINGA fellowship](#)

First Employment: Research Scientist, Abu Dhabi Investment Authority (ADIA)

**PhD Thesis:** “Neural Abstractive Summarization: Improvements at the Sequence-Level”

- **Undergraduate FYP Students**

1. [Do Xuan Long](#) (URECA FYP) [Aug, 2021 - Jul, 2023] [[Outstanding Undergraduate Award](#); Current Position: PhD student @NUS]
2. [Han Simeng](#) [Mar, 2019 - Jul, 2021] [[Best Final Year Thesis Gold Medal](#); Current Position: PhD student in CS @ Yale University, USA]
3. Shen Youlin [Mar, 2020 - Dec, 2020]
4. Rixie Tiffany Ko Leong [Jan, 2021 - Dec, 2021]
5. Angshuk Dutta [Aug, 2021 - Mar, 2022]

- **Visiting Students**

1. [Sameer Khurana](#) [May, 2018 - Aug, 2018]. (Now PhD student at MIT-CSAIL, USA)
2. [Jing MA](#) [Dec, 2018 - Aug, 2019]. (Now Asst Prof at Hong Kong Baptist University)
3. Lingzhi Wang [Aug 2021 - Nov 2021] (Now a PhD student at HKUST, Hong Kong)
4. [Enamul Hoque](#) [Feb, 2016 - May, 2016] (Now Asst. Prof. at York Univ, Canada)
5. [Aarti Sathyanarayana](#) [July, 2016 - Dec, 2016] (Now Asst Prof at Northeastern University, USA)