Address Salesforce AI Research

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Computer Science & Engineering (SCSE), NTU

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CURRENT INTERESTS AND PROJECTS THAT I LEAD

• 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

Sr. Research Director Salesforce Research, Palo Alto, USA Leading efforts on Agents (SFR-Agentic-RAG, SFR-Agent-Judge)	Feb'25 - present
Research Director Salesforce Research, Palo Alto, USA Leading efforts on foundation LLMs (xGen, SFR-RAG, SFR-Judge)	Aug'22 - Jan'24
Associate Professor (tenured, on leave since Aug'22) Nanyang Technological University (NTU), Singapore Founder of NTU-NLP Group	Mar'22 - present
Senior Manager Salesforce AI Research, Singapore Founding manager of the lab	Feb'19 - Aug'22
Assistant Professor Nanyang Technological University (NTU), Singapore	Aug'17 - Feb'22
Research Scientist Qatar Computing Research Institute, Qatar	Jan'14 - Jul'17
Research & Teaching Assistant University of British Columbia, University of Lethbridge	Aug'06 - Dec'13
Research Intern Microsoft Research	Sep'10 - Nov'10
Lecturer Islamic University of Technology, Bangladesh	Jan'05 - Aug'06

EDUCATION

Ph.D. (Computer science)

2008-2014

University of British Columbia (UBC), Vancouver, Canada

"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

- Presidential Award, Salesforce T&P 2025
- 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 Scholarship¹ (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

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

KEYNOTES

- 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 Seminer, 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

- 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

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

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 METH-ODS 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).
- 16. 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).
- 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. 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).

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 METH-ODS 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 EVAL-UATING 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. 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).
- 12. 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).
- 13. Wojciech Kryscinski, Alex Fabbri, Caiming Xiong, **Shafiq Joty**, Jason Wu, Divyansh Agarwal, Philippe Laban, "SYSTEMS AND METHODS FOR FACTUAL NATURAL LANGAUGE PROCESSING", *US63503701* **US patent**, Filing Date: Sep 26 (2023).

- 14. 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).
- 15. **Shafiq Joty**, Peifeng Wang, Bert Legrand, Lifu Tu, Sarah Tan, Casey O'Donnell, Jimmy Bowen, "LARGE LANGUAGE MODEL (LLM) BENCHMARKS FOR ARTIFICIAL INTELLIGENT (AI) AGENTS USE CASES IN A CUSTOMER RELATIONSHIP MANAGEMENT (CRM) ENVIRONMENT", US19042737 US patent, Filing Date: Jan 31 (2025).
- 16. **Shafiq Joty**, Peifeng Wang, Bert Legrand, Lifu Tu, Sarah Tan, Casey O'Donnell, Jimmy Bowen, "LARGE LANGUAGE MODEL (LLM) BENCHMARK FOR CUSTOMER RE-LATIONSHIP MANAGEMENT (CRM)", *US19042920* **US patent**, Filing Date: Jan 31 (2025).
- 17. 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).
- 18. 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).
- 19. 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).
- 20. 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

• 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).
- 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).

^{*} Indicates co-lead author;

^{**} Most of the codes of my papers can be found in the NTU-NLP group page

- 4. Tasnim Mohiuddin and **Shafiq Joty**, "Unsupervised Word Translation with Adversarial Autoencoder", Computational Linguistics **46:2**, (presented at ACL-2020) (Jun, 2020).
- 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).
- Shafiq Joty, Francisco Guzmán, Lluís Màrquez, and Preslav Nakov., "Discourse Structure in Machine Translation Evaluation.", Computational Linguistics. 43:4, 683–722 (Dec, 2017).
- 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; csl.2016.12.006, 161–179 (Sep, 2017).
- 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; csl.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).
- 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 Dhinagaran, 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).
- 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", *Neuro-computing* **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 Dhinagaran, 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).
- Aarti Sathyanarayana, Shafiq Joty, Luis Fernandez-Luque, Ferda Offi, Jaideep Srivastava, Ahmed Elmagarmid, Shahrad 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]

- * Indicates co-lead author;
- ** Most of the codes of my papers can be found in the NTU-NLP group page

- 1. Fangkai Jiao, Geyang Guo, Xingxing Zhang, Nancy F., **Shafiq Joty**, and Furu Wei., "Preference Optimization for Reasoning with Pseudo Feedback", In International Conference on Learning Representations (ICLR-25 spotlight), Singapore (2025).
- 2. Yifei Ming, Senthil Purushwalkam, Shrey Pandit, Zixuan Ke, Xuan-Phi Nguyen, Caiming Xiong, and Shafiq Joty., "FaithEval: Can Your Language Model Stay Faithful to Context, Even If "The Moon is Made of Marshmallows", In International Conference on Learning Representations (ICLR-25), Singapore (2025).
- 3. David Wan and Jesse Vig and Mohit Bansal and **Shafiq Joty**., "On Positional Bias of Faithfulness for Long-form Summarization", In 2025 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL-25), New Mexico, USA (2025).
- 4. Yixin Liu, Kejian Shi, Alexander Fabbri, Yilun Zhao, Peifeng Wang, Chien-Sheng Wu, Shafiq Joty, and Arman Cohan., "ReIFE: Re-evaluating Instruction-Following Evaluation", In 2025 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL-25), New Mexico, USA (2025).
- 5. Xingxuan Li, Xuan-Phi Nguyen, **Shafiq Joty**, and Lidong Bing., "ParaICL: Towards Robust Parallel In-Context Learning", In 2025 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL-25), New Mexico, USA (2025).
- 6. Do Long, Hai Ngoc, Tiviatis Sim, Hieu Dao, Shafiq Joty, Kenji Kawaguchi, Nancy Chen, and Min-Yen Kan., "LLMs Are Biased Towards Output Formats! Systematically Evaluating and Mitigating Output Format Bias of LLMs", In 2025 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL-25), New Mexico, USA (2025).

- Ahmed Masry, Megh Thakkar, Aayush Bajaj, Aaryaman Kartha, Enamul Hoque, and Shafiq Joty, "ChartGemma: Visual Instruction-tuning for Chart Reasoning in the Wild", In Proceedings of the 31st International Conference on Computational Linguistics (COLING-25), Abu Dhabi, UAE (2025).
- 8. Minzhi Li, Zhengyuan Liu, Shumin Deng, **Shafiq Joty**, Nancy Chen, and Min-Yen Kan., "DnA-Eval: Enhancing Large Language Model Evaluation through Decomposition and Aggregation", *In Proceedings of the 31st International Conference on Computational Linguistics* (COLING-25), Abu Dhabi, UAE (2025).

- 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 (2024). Outstanding paper award.
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- 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 3rd place in English subtask of Task 3)
- 7. Shafiq Joty, Francisco Guzman, Lluis 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

- 1. Language Model Adaptation for Low-Resource Languages and Dialects., "Ministry of Education (MOE) Tier-2", 713,000 SGD (Feb, 2023 Feb, 2026).
- 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).
- 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

- 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

- 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)
- 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

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

STUDENTS

- 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)