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## RESEARCH INTERESTS

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- Natural Language Processing
  - NLP tools (Syntactic/Semantic/Discourse Parsing, Coherence models, Topic models)
  - Multi-lingual NLP (Machine Translation, Cross-lingual tasks)
  - Text generation (text2text, data2text)
  - Robust and fair NLP
  - NLP Applications (Question answering, Dialogue systems)
  - Multi-modal NLP (Visual-Language Pretraining, Speech, NLP for programming)
- Machine Learning & Data Science
  - Deep/Representation learning
  - Probabilistic graphical models
  - Reinforcement learning

## PROFESSIONAL EMPLOYMENTS

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Research Director (full time) <i>Salesforce AI Research,</i> <i>Palo Alto, USA</i>	Aug'22 - present
Associate Professor (tenured, <b>on leave</b> ) <i>Nanyang Technological University (NTU), Singapore</i> <i>Founder of NTU-NLP Group</i>	Mar'22 - present
Senior Manager (part time)	Feb'19 - Aug'22

*Salesforce AI Research, Singapore*  
*Founding member of the Asia lab*

**Assistant Professor** Aug'17 - Feb'22  
*Nanyang Technological University (NTU), Singapore*

**Research Scientist** Jan'14 - Jul'17  
*Qatar Computing Research Institute, Qatar*

**Research & Teaching Assistant** Aug'06 - Dec'13  
*University of British Columbia*  
*University of Lethbridge*

**Research Intern** Sep'10 - Nov'10  
*Microsoft Research*

**Lecturer** Jan'05 - Aug'06  
*Islamic University of Technology, Bangladesh*

## EDUCATION

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**Ph.D. (Computer science)** 2008-2013  
*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

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- NTU College of Engineering (CoE) Young Faculty Award (Research)  
2022 (Nominated by SCSE, Under evaluation)
- 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

## TEACHING EXPERIENCE

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Instructor, Nanyang Technological University (NTU) 2017 - present

- **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)

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

(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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### **Published/Granted 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. Karan Aggarwal, Swaraj Khadanga, **Shafiq Joty**, Louis Kazaglis, and Jaideep Srivastava, “[COMPUTER ARCHITECTURE FOR IDENTIFYING SLEEP STAGES](#)”, **US 2021/0023331 A1**, US Patent (2021).
3. 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).
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. 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).
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. 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).
8. 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).
9. Samson Tan and **Shafiq Joty.**, “[SYSTEMS AND METHODS FOR CODE-MIXING ADVERSARIAL TRAINING](#)”, *Patent Nb:US20220164547A1* **US Patent**, Filing Date: January 15, 2021 (2021).

## Filed Patents

1. 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).
2. 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).
3. Yue Wang, Weishi Wang, **Shafiq Joty** and Chu Hong Hoi., “SYSTEMS AND METHODS FOR CODE UNDERSTANDING AND GENERATION”, *70689.170PV01 (63/189,857) US patent*, Filing Date: May 18, 2021 (2021).
4. Akhilesh Deepak Gotmare, Junnan Li, **Shafiq Joty** and Chu Hong Hoi., “SYSTEMS AND METHODS FOR SEMANTIC CODE SEARCH”, *70689.166PV01 (63/189,854) US patent*, Filing Date: May 18, 2021 (2021).
5. 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).
6. 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).
7. 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).
8. 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. Tasnim Mohiuddin and **Shafiq Joty**, “[Unsupervised Word Translation with Adversarial Autoencoder](#)”, *Computational Linguistics* **46:2**, (presented at ACL-2020) (Jun, 2020).
2. **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).
3. **Shafiq Joty**, Francisco Guzmán, Lluís Màrquez, and Preslav Nakov., “[Discourse Structure in Machine Translation Evaluation.](#)”, *Computational Linguistics*. **43:4**, 683–722 (Dec, 2017).

4. **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).
5. 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).
6. **Shafiq Joty**, Giuseppe Carenini and Raymond Ng, “[CODRA: A Novel Discriminative Framework for Rhetorical Analysis.](#)”, *Computational Linguistics*. **41:3**, 385–435, MIT press (2015).
7. **Shafiq Joty**, Giuseppe Carenini and Raymond Ng, “[Topic Segmentation and Labeling in Asynchronous Conversations.](#)”, *Journal of AI Research*. **47**, 521-573 (2013).
8. 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).
9. 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 Offi, 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

### 2022

1. Xuan-Phi Nguyen, **Shafiq Joty**, Wu Kui and Ai Ti., "[Refining Low-Resource Unsupervised Translation by Language Disentanglement of Multilingual Translation Model.](#)", In *2022 Conference on Neural Information Processing Systems (NeurIPS'22)*, New Orleans, USA (2022).
2. Iva Bojic, Qi Ong, Megh Thakkar, Esha Kamran, Irving Shua, Rei Pang, Jessica Chen, Vaaruni Nayak, **Shafiq Joty** and Josip Car., "[SleepQA: A Health Coaching Dataset on Sleep for Extractive Question Answering.](#)", In *2022 Machine Learning for Health (Proceedings Track) (ML4H@NeurIPS'22)*, New Orleans, USA (2022).
3. Mathieu Ravaut, **Shafiq Joty** and Nancy Chen, "[Towards Summary Candidates Fusion](#)", In *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP-2022)*, Abu Dhabi, UAE (2022).
4. Hailin Chen, Amrita Saha, **Shafiq Joty**, and Steven Hoi., "Learning Label Modular Prompts for Text Classification in the Wild", In *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP-2022)*, Abu Dhabi, UAE (2022).
5. Linlin Liu, Xin Li, Ruidan He, Lidong Bing, **Shafiq Joty**, and Luo Si, "[Enhancing Multilingual Language Model with Massive Multilingual Knowledge Triples.](#)", In *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP-2022)*, Abu Dhabi, UAE (2022).
6. Shankar Kantharaj, Xuan Long Do, Rixie Leong, Jia Tan, Ahmed Masry, Enamul Hoque and **Shafiq Joty**, "[OpenCQA: Open-ended Question Answering with Charts.](#)", In *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP-2022)*, Abu Dhabi, UAE (2022).
7. Ramit Sawhney, Megh Thakkar, Vishwa Shah, Shrey Pandit and **Shafiq Joty**, "AdaPT: A Set of Guidelines for Hyperbolic Multimodal Multilingual NLP.", In *Findings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP-2022)*, Abu Dhabi, UAE (2022).
8. Tasnim Mohiuddin, Philipp Koehn, Vishrav Chaudhary, James Cross, Shruti Bhosale and **Shafiq Joty**, "[Data Selection Curriculum for Neural Machine Translation.](#)", In *Findings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP-2022)*, Abu Dhabi, UAE (2022).
9. Qian Li, **Shafiq Joty**, Daling Wang, Shi Feng, Yifei Zhang, "[Alleviating Sparsity of Open Knowledge Graphs with Ternary Contrastive Learning.](#)", In *Findings of the 2022 Conference*



on *Empirical Methods in Natural Language Processing (EMNLP-2022)*, Abu Dhabi, UAE (2022).

10. Guangsen Wang, Samson Tan, **Shafiq Joty**, Gang Wu, Jimmy Au and Steven Hoi., “[BotSIM: An End-to-End Bot Simulation Framework for Commercial Task-Oriented Dialog Systems.](#)”, In *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP-2022 demo)*, Abu Dhabi, UAE (2022).
11. Chengwei Qin and **Shafiq Joty**, “[LFPT5: A Unified Framework for Lifelong Few-shot Language Learning Based on Prompt Tuning of T5](#)”, In *International Conference on Learning Representations (ICLR-2022)*, (Online).
12. Xuan-Phi Nguyen, Hongyu Gong, Yun Tang, Chaghan Wang, Philipp Koehn and **Shafiq Joty**, “[Contrastive Clustering to Mine Pseudo Parallel Data for Unsupervised Translation](#)”, In *International Conference on Learning Representations (ICLR-2022)*, (Online).
13. Chengwei Qin and **Shafiq Joty**, “[Continual Few-shot Relation Learning via Embedding Space Regularization and Data Augmentation](#)”, In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics (ACL-2022)*, Dublin, Ireland (2022).
14. Prathyusha Jwalapuram, **Shafiq Joty** and Xiang Lin, “[Rethinking Self-Supervision Objectives for Generalizable Coherence Modeling](#)”, In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics (ACL-2022)*, Dublin, Ireland (2022).
15. Mathieu Ravaut, Nancy Chen and **Shafiq Joty**, “[SummaReranker: A Multi-Task Mixture-of-Experts Re-Ranking Framework for Abstractive Summarization](#)”, In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics (ACL-2022)*, Dublin, Ireland (2022).
16. Shankar Kantharaj, Rixie Leong, Xiang Lin, Ahmed Masry, Megh Thakkar, Enamul Hoque and **Shafiq Joty**, “[Chart-to-Text: A Large-Scale Benchmark for Chart Summarization](#)”, In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics (ACL-2022)*, Dublin, Ireland (2022).
17. Ahmed Masry, Do Xuan, Jia Qing, **Shafiq Joty** and Enamul Hoque, “[ChartQA: A Benchmark for Question Answering about Charts with Visual and Logical Reasoning](#)”, In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics (ACL-2022)*, Dublin, Ireland (2022).
18. Bosheng Ding, Junjie Hu, Lidong Bing, Mahani Aljunied, **Shafiq Joty**, Luo Si, and Chunyan Miao., “[GlobalWoZ: Globalizing MultiWoZ to Develop Multilingual Task-Oriented Dialogue Systems](#)”, In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics (ACL-2022)*, Dublin, Ireland (2022).
19. Han-Cheol Moon, **Shafiq Joty**, and Xu Chi., “[GradMask: Gradient-Guided Token Masking for Textual Adversarial Example Detection](#)”, In *28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD’22)*, Washington, USA (2022).
20. Xuan Do, Bowei Zou, Liangming Pan, Nancy Chen, **Shafiq Joty**, and Ai Ti., “[CoHS-CQG: Context and History Selection for Conversational Question Generation.](#)”, In *Proceedings of the 29th International Conference on Computational Linguistics. (COLING’22)*, Gyeongju, Republic of Korea (2022).



21. Linlin Liu, Thien Hai Nguyen, **Shafiq Joty**, Lidong Bing and Luo Si., “[Towards Multi-Sense Cross-Lingual Alignment of Contextual Embeddings.](#)”, In *Proceedings of the 29th International Conference on Computational Linguistics. (COLING’22)*, Gyeongju, Republic of Korea (2022).
22. Amrita Saha, **Shafiq Joty**, and Steven Hoi., “[Weakly Supervised Neuro-Symbolic Module Networks for Numerical Reasoning.](#)”, In *Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI-2022)*, Vancouver, Canada (2022).
23. Jiahui Gao, Yi Zhou, Philip Yu, **Shafiq Joty**, and Jiuxiang Gu., “[Unsupervised Cross-lingual Image Captioning.](#)”, In *Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI-2022)*, Vancouver, Canada (2022).
24. Peng Chen, Hui Li, Sourav Bhowmick, **Shafiq Joty**, and Weiguo Wang, “[LANTERN: Boredom-conscious Natural Language Description Generation of Query Execution Plans for Database Education](#)”, In *Proceedings of 2022 ACM SIGMOD International Conference on Management of Data (SIGMOD’22 Demo)*, Philadelphia, PA, USA (2022).

## 2021

1. Junnan Li, Ramprasaath R., Akhilesh Deepak, **Shafiq Joty**, Caiming Xiong, and Steven Hoi., “[Align before Fuse: Vision and Language Representation Learning with Momentum Distillation.](#)”, In *2021 Conference on Neural Information Processing Systems (NeurIPS’21 (Spotlight ~3%))*, Online (2021).
2. Xiang Lin, Simeng Han and **Shafiq Joty.**, “[Straight to the Gradient: Learning to Use Novel Tokens for Neural Text Generation.](#)”, In *Proceedings of the Thirty-eighth International Conference on Machine Learning (ICML’21 (Long talk ~3%))*, Virtual Conference (2021).
3. Xuan-Phi Nguyen, **Shafiq Joty**, Wu Kui and Ai Ti Aw., “[Cross-model Back-translated Distillation for Unsupervised Machine Translation.](#)”, In *Proceedings of the Thirty-eighth International Conference on Machine Learning (ICML’21)*, Virtual Conference (2021).
4. M Saiful Bari and Tasnim Mohiuddin and **Shafiq Joty**, “[UXLA: A Robust Unsupervised Data Augmentation Framework for Cross-Lingual NLP.](#)”, In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics (ACL’21)*, Bangkok, Thailand (2021).
5. Samson Tan, **Shafiq Joty**, Kathy Baxter, Araz Taeihagh, Gregory A. Bennett and Min-Yen Kan, “[Reliability Testing for Natural Language Processing Systems: An Adversarial Perspective.](#)”, In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics (ACL’21)*, Bangkok, Thailand (2021).
6. Thanh-Tung Nguyen, Xuan-Phi Nguyen, **Shafiq Joty** and Xiaoli Li., “[A Conditional Splitting Framework for Efficient Constituency Parsing.](#)”, In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics (ACL’21)*, Bangkok, Thailand (2021).
7. Linlin Liu, Bosheng Ding, Lidong Bing, **Shafiq Joty**, Luo Si and Chunyan Miao, “[MulDA: A Multilingual Data Augmentation Framework for Low-Resource Cross-Lingual NER.](#)”, In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics (ACL’21)*, Bangkok, Thailand (2021).

8. Tasnim Mohiuddin, M Saiful Bari and **Shafiq Joty**., “[AugVic: Exploiting BiText Vicinity for Low-Resource NMT.](#)”, *In Findings of the 59th Annual Meeting of the Association for Computational Linguistics (ACL’21)*, Bangkok, Thailand (2021).
9. Yue Wang, Weishi Wang, **Shafiq Joty**, and Steven Hoi., “[CodeT5: Identifier-aware Unified Pre-trained Encoder-Decoder Models for Code Understanding and Generation.](#)”, *In Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing (EMNLP’21)*, Punta Cana, Dominican Republic (2021).
10. Tao Yu and **Shafiq Joty**, “Effective Fine-tuning Methods for Cross-lingual Adaptation.”, *In Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing (EMNLP’21)*, Punta Cana, Dominican Republic (2021).
11. Yingzhu Zhao, Chongjia Ni, Cheung-Chi LEUNG, **Shafiq Joty**, Eng Siong, and Bin Ma., “A Unified Speaker Adaptation Approach for ASR.”, *In Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing (EMNLP’21)*, Punta Cana, Dominican Republic (2021).
12. Ben Krause, Akhilesh Deepak, Bryan McCann, Nitish Shirish, **Shafiq Joty**, Richard Socher, and Nazneen Fatema., “[GeDi: Generative Discriminator Guided Sequence Generation.](#)”, *In Findings of the 2021 Conference on Empirical Methods in Natural Language Processing (EMNLP’21)*, Punta Cana, Dominican Republic (2021).
13. Samson Tan and **Shafiq Joty**, “[Code-Mixing on Sesame Street: Dawn of the Adversarial Polyglots.](#)”, *In Proceedings of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-2021)*, Mexico City, Mexico (2021).
14. Thanh-Tung Nguyen, Xuan-Phi Nguyen, **Shafiq Joty**, and Xiaoli Li, “[RST Parsing from Scratch.](#)”, *In Proceedings of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-2021)*, Mexico City, Mexico (2021).
15. Alexander Fabbri, Simeng Han, Haoyuan Li, Haoran Li, Marjan Ghazvininejad, **Shafiq Joty**, Dragomir Radev, and Yashar Mehdad, “[Improving Zero and Few-Shot Abstractive Summarization with Intermediate Fine-tuning and Data Augmentation.](#)”, *In Proceedings of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-2021)*, Mexico City, Mexico (2021).
16. Weiwen Xu, AiTi Aw, Yang Ding, Kui Wu and **Shafiq Joty**, “[Addressing the Vulnerability of NMT in Input Perturbations.](#)”, *In Proceedings of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (Industry track) (NAACL-2021)*, Mexico City, Mexico (2021).
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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 (ILIVI-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).

## **TUTORIALS AT INTERNATIONAL CONFERENCES**

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1. [NLP4Vis: Natural Language Processing for Information Visualization](#), Enamul Haque and **Shafiq Joty**, **IEEEVis-2012**, Oklahoma City, USA. ([Slides](#))
2. [Discourse Analysis and Its Applications](#), **Shafiq Joty**, Giuseppe Carenini, Raymond Ng, and Gabriel Murray, **ACL-2019**, Florence, Italy. ([Slides](#))
3. [Discourse Processing and Its Applications in Text Mining](#), **Shafiq Joty**, Giuseppe Carenini, Raymond Ng, and Gabriel Murray, **ICDM-2018**, Singapore. ([Slides](#))
4. [NLP for Conversations: Sentiment, Summarization, and Group Dynamics](#), Gabriel Murray, **Shafiq Joty**, and Giuseppe Carenini., **COLING-2018**, Santa Fe, New Mexico. ([Slides](#))

## **INVITED TALKS**

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### **Keynote at International Conference**

1. [“Model, Task and Data Engineering for NLP”](#), Baidu Research Speaker Series, International Conference on Natural Language Processing and Information Retrieval (NLPIR), Dec. 2022

### **Other Invited Talks**

1. “Novel Data and Task Engineering Methods for NLP”, Baidu Research Speaker Series, Baidu Research, May. 2022
2. [“Model, Data and Task Engineering for NLP”](#), University of California Santa Cruz , UCSC seminar, Apr. 2022

3. [“Model, Task and Data Engineering for NLP”](#), Open Data Science Conference (ODSC), APAC Region, Sept. 2021
4. “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
5. “Panel Discussion - Get Started with AI Startups”, International Student Conference On Artificial Intelligence (STCAI, NTU), Aug, 2021,
6. “Model, Task and Data Engineering for NLP”, UBC, Canada, June. 2021
7. “Model, Task and Data Engineering for NLP”, York University, Canada, June. 2021
8. “Model, Task and Data Engineering for NLP”, SEA AI Lab, Singapore, June. 2021
9. [“Model, Task and Data Engineering for NLP”](#), NUS, Singapore, June. 2021
10. “Towards Robust Multi-lingual Multi-dialectal NLP Models”, Alibaba Damo Academy, Singapore, Mar. 2021
11. [“A Rights-Based Approach to the Design and Use of AI”](#), Algorithmic Justice Knowledge Sharing Session,, NBS Communications, Webinar, Nov 2020
12. “NLP Research at NTU-NLP”, Alibaba NTU JRI, Online, Nov. 2020
13. [“Panel Discussions: Ethics in AI”](#), The 2019 Singapore Symposium on Natural Language Processing, SSNLP-2019, Nov. 2019
14. “Discourse Analysis with Deep Learning”, TU-Darmstadt, Germany, July. 2019
15. “Deep Structured Models for Natural Language Processing”, NTU-WeBank Training Program, NTU, Singapore,, Jun. 2019
16. “Deep Structured Models for Natural Language Processing”, IET x MLDA@EEE NLP Workshop, NTU,, NTU, Singapore,, Apr. 2019
17. “Structured Models for Discourse Analysis and NLP Applications ”, Alibaba, Singapore, Jan. 2019
18. [“Deep Structured Models for Natural Language Processing”](#), NTU-SenseTime Research Seminar, NTU, Singapore, Nov. 2018
19. “Deep Structured Models for Natural Language Processing ”, Salesforce AI Research, Palo Alto, USA, Oct. 2018
20. “Deep Learning for Multilingual and Multimodal Processing”, DSO National Laboratories, Singapore, Oct. 2018
21. [“Deep Learning for Multilingual and Multimodal Processing”](#), Industry-NTU Dialogue: AI Research, Innovation and Talent, NTU, Singapore, Sep. 2018
22. “Discourse Analysis and Its Applications”, Gwangju Institute of Science and Technology (GIST), South Korea, Dec. 2017



23. “How Computational Linguistics can help Computational History”, Johannesburg Institute for Advanced Study (JIAS), Johannesburg, South Africa, Nov. 2017
24. “Discourse Analysis and Its Applications”, National University of Singapore (NUS), Singapore, Oct. 2017
25. “Discourse Analysis and Its Applications”, Institute for Infocomm Research A\*Star, Singapore, Sep. 2017
26. [“Structured Predictions for Discourse Analysis and Applications in Natural Language Processing”](#), Singapore University of Technology and Design (SUTD), Singapore, Sep. 2017
27. “Structured Predictions for Discourse Analysis and Applications in Natural Language Processing”, University of Calgary, Calgary, Canada, Mar. 2017
28. “Structured Predictions for Discourse Analysis and Applications in Natural Language Processing”, University of Waterloo, Waterloo, Canada, Feb. 2017
29. “Structured Predictions for Discourse Analysis and Applications in Natural Language Processing”, Nanyang Technological University (NTU), Singapore, Nov. 2016
30. “Introduction to Machine Learning”, Global Entrepreneurship Week, Doha, Nov. 2015
31. “Discourse Analysis & its Applications”, Chinese University of Hong Kong., Oct. 2015
32. “CODRA: A Complete Discriminative Framework for Rhetorical Analysis”, Universite Paul Sabatier, Toulouse, France., Sep. 2014
33. “Discourse Analysis of Asynchronous Conversations”, University of British Columbia, Vancouver, Canada., Dec. 2013
34. “Intra- and Multi-sentential Rhetorical Parsing for Document-level Discourse Analysis”, NSERC Business Intelligence Network AGM, IBM Software Labs, Canada., Nov. 2012
35. “A Novel Discriminative Framework for Sentence-Level Discourse Analysis”, NW-NLP workshop, Microsoft Research Redmond., May, 2012
36. “Discourse Analysis of Asynchronous Conversations (e.g., emails, blogs)”, Business Intelligence (BI) Workshop-NSERC BIN Watson, IBM Watson center, Feb, 2012
37. “Discourse Analysis of Asynchronous Conversations (e.g., emails, blogs)”, UBC Social Network Group, Feb, 2012
38. “Unsupervised Modeling of Dialog Acts in Asynchronous Conversations”, UBC Laboratory for Computational Intelligence (LCI) Forum Talk, Apr, 2011
39. “Topic and Dialog Act Modeling of Asynchronous Conversations”, Microsoft Research Asia, Nov, 2010
40. “What are they talking about?” Finding Topics in Email Conversations”, UBC Laboratory for Computational Intelligence Forum (LCI) Talk, Feb, 2010
41. “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:** [ACL-2022](#) (ML track), [EMNLP-2021](#) (Applications track)
4. **Area chair:** NeurIPS-2023 (NLP), [ICLR-2023](#) (NLP), [EMNLP-2022](#) (Discourse track), [COLING-2022](#) (Discourse track), [ACL-2021](#) (ML track), [ACL-2020](#) (Discourse track), [NAACL-2021](#) (Discourse track), [ACL-2019](#) (QA), [EMNLP-2019](#) (Discourse track)
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/KDD [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. [Esther \(Ruochen\) Zhao](#) [Jan, 2021 - Present, AISG Fellowship]
3. [Mathieu Ravaut](#) [Jan, 2021 - Present, A\*Star RSS-SINGA fellowship]
4. [Chen Hailin](#) [Jan, 2021 - Present, Salesforce IPP NTU]
5. [Chengwei Qin](#) [Jan, 2021 - Present, NTU Graduate Scholarship]
6. [Bosheng Ding \(co-supervision\)](#) [Jan, 2020 - Present]

- **Graduated Students (PhD) (Thesis submitted)**

1. [Xuan Phi Nguyen](#) [PhD, Aug, 2019 - Mar, 2023] [SDSC dissertation fellowship, A\\*STAR ACIS fellowship](#)
2. [Han-Cheol Moon](#) [PhD, Aug, 2019 - Mar, 2023] [SINGA-SINGA fellowship](#)
3. [Linlin Liu \(co-supervision\)](#) [PhD, Jan, 2019 - Dec, 2022] [Alibaba-NTU IGS fellowship](#)
4. [Saiful Bari](#) [Jan, 2019 - Mar, 2023] [NTU Graduate Scholarship](#)
5. [Lin Xiang](#) [Jan, 2019 - Mar, 2023]

- **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” ([Nominated for best thesis award 2022 \(under evaluation\)](#))
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”

- **Undergraduate FYP Students**

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

## • 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)

## REFERENCES

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### [Dr. Giuseppe Carenini](#)

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