Sashank Santhanam

Department of Computer Science
University of North Carolina at Charlotte
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Education

University of North Carolina – Charlotte Charlotte, NC
Ph.D. in Computer Science May 2021

- Research area: Dialogue Systems, Human Behavior Modeling
- Advisors: Dr. Samira Shaikh
- Committee: Dr. Wlodek Zadrozny, Dr. Minwoo Jake Lee, Dr. Nicholas Davis

University of North Carolina – Charlotte Charlotte, NC
MS in Computer Science Dec 2015

- Research area: Social Media Analysis
- Advisors: Dr. Shaoting Zhang

Anna University Tamil Nadu, India
BE in Computer Science and Engineering May 2014

- Research area: Bayesian Networks

Work Experience

JP Morgan & Chase Seattle, WA
Senior Applied AI/ML Researcher July 2021 - Present

- Leading the efforts to develop NLU models to identify the domain, intent, and entity for conversational agents.
- Built data augmentation library to help generate more training data in low-resource settings.

University of North Carolina – Charlotte Charlotte, NC
Research Assistant Jan 2017 - May 2021

- **Conversational Agents for Cybersecurity Defense**
  - Understanding the importance of relationships between speakers in dialogue generation and modeling relationships across social networks.
  - Generating personalized messages through conversational agents and engaging countermeasures strategies for social engineering and phishing attacks.

- **Understanding Decision Making**
  - Evaluating the impact of anchoring and confirmation bias on decision making through visual interfaces for tasks on identifying and interpreting misinformation.
  - Evaluating the impact of cognitive biases and experiment design towards conversational dialogue output evaluation.

- **Human Behavior Modeling**
  - Analysis of Twitter and Gab.com to understand how the online community comes together to express messages of solidarity through text and emojis
  - Cross-platform analysis on Twitter and Gab.com for abusive language through various crisis events.

Amazon Remote
Applied Research Intern Sept 2020 - Dec 2020

- Worked on developing approaches to make conversational agents more factually consistent with regards to external knowledge
- Created a new large factual detection dataset called "Conv-FEVER" (~350K)
- Built a fact detector that improves the SOTA performance from 72.9% to 85.4%
- Integrated multiple retrievers: DPR and KNN-LM into the GPT2 based response generation pipeline
- Evaluated the impact of different decoding strategies Beam Search, Nucleus Sampling, and Delayed Beam Search to produce factual consistent responses
- Mentors: Behnam Hedayatnia, Spandana Gella, Dilek Hakkani-Tur

Nvidia Remote
Research Intern May 2020 - Sept 2020

- Worked on incorporating external knowledge into conversational agents
- Collected a new large scale dataset (50M) for incorporating external knowledge to conversational agents from the Reddit social media
- Trained large conversational agents (8.3B) by combining KNN-based retrieval search to provide more accurate knowledge to the conversational agents.
- Mentors: Wei Ping, Raul Puri, Mohammad Shoeybi, and Mostofa Patwary

Walmart, Global Shared Service Charlotte, NC
Data Analyst Mar 2016 – Nov 2016

- Developed software to help the associates at Walmart to process invoices and other receipts.
- Reduced workload of the associates by auto-matching invoices and the receipts.
- Developed workflows in alteryx and dashboards using Tableau to help in tracking the backlogs.

Indian Institute of Technology, Madras Tamil Nadu, India
Intern Jun 2013 – Dec 2013

- Implemented a scoring algorithm in R to analyze the emotional variation on Twitter data during sporting events
- Advisor: Dr. Saji K. Matthew

Conference Publications

1) **Santhanam S.,** Hedayatnia B., Gella S., Padmakumar A., Kim S., Liu Y., Hakkani-Tur D., "Rome was built in 1776: A Case Study on Factual Correctness in Knowledge-Grounded Response Generation", in 3rd Workshop on Natural Language Processing for Conversational AI, EMNLP, 2021

2) Gehrmann S. et al., "The GEM Benchmark: Natural Language Generation, its Evaluation and Metrics", in 1st Workshop on Natural Language Generation, Evaluation, and Metrics, ACL, 2021

3) **Santhanam S.,** Ping W., Puri R., Shoeybi M., Patwary M., Catanzaro B., "Local Knowledge Powered Conversational Agents", in 3rd Workshop on Natural Language Processing for Conversational AI, EMNLP, 2021

4) **Santhanam S.,** Cheng Z., Brodie M., Dorr BJ., Bhatia A., Hebenstreit B., Zemel A., Dalton A., Strzalkowski T., Shaikh S, "Learning to Plan and Realize Separately for Open-Ended Dialogue Systems", in Findings of Empirical Methods in Natural Language Processing, 2020

5) Howcroft DM., Belz A., Clinciu M., Gkatzia D., Hasan SA., Mahamood S., Mille S., Rieser V., **Santhanam S.**, van-Miltenburg E., "Twenty Years of Confusion in Human Evaluation: NLG needs evaluation sheets and standardised definitions", in 13th International Natural Language Generation Conference, 2020

6) Bhatia A., Dalton A., Brodie M., **Santhanam S.**, Shaikh S., Zemel A., Strzalkowski T., Dorr BJ., "Adaptation of a Lexical Organization for Social Engineering Detection and Response Generation", in Social Threats in Online Conversations, LREC, 2020

7) Dalton A., Aghaei E., Al-Shaer E., Bhatia A., Castillo E., Cheng Z., Dhaduvai S., Duan Q., Hebenstreit B. , Islam M., Karimi Y., Masoumzadeh A., Mather B., **Santhanam S.**, Shaikh S., Zemel A., Strzalkowski T., Dorr BJ., "Active Defense Against Social Engineering: The Case for Human Language Technology", in Social Threats in Online Conversations, LREC, 2020

8) **Santhanam S**., Shaikh S., "Modeling Conversation Context by Adapting Cognitive Architectures", in Bridging AI and Cognitive Science, ICLR, 2020

9) **Santhanam S.,** Karduni A., Shaikh S., "Studying the effects of Cognitive Biases in Evaluation of Conversational Agents", in ACM CHI 2020, Hawaii **[Best Paper Honorable Mention]**

10) Dorr B., Bhatia A., Dalton A., Mather B., Hebenstreit B., **Santhanam S.**, Cheng Z., Shaikh S., Zemel A., Strzalkowski T., "Detecting Asks in Social Engineering Attacks: Impact of Linguistic and Structural Knowledge", in the 34th AAAI Conference on Artificial Intelligence, New York, USA

11) **Santhanam S**., Shaikh S., "Modeling Conversation Context by Adapting Cognitive Architectures", in 1st Workshop on Discourse Structure in Neural NLG 2019, Tokyo, Japan [Non-Archival]

12) **Santhanam S**., Shaikh S., "Emotional Neural Language Generation Grounded in Situational Contexts", in 4th Workshop on Computer Creativity in Natural Language Generation 2019, Tokyo, Japan

13) **Santhanam S**., Shaikh, S., "Towards Best Experiment Design in Evaluating Dialogue System Output", in 12th International Natural Language Generation Conference 2019, Tokyo, Japan

14) Wesslen R., **Santhanam, S.**, Karduni A., Cho I., Shaikh S., Dou W., "Investigating Effects of Visual Anchors on Decision-Making about Misinformation", in 21st International IEEE Conference on Visualization (EuroVis) 2019, Porto, Portugal

15) Karduni A., Cho I. Wesslen R., **Santhanam S.**, Volkova S., Arendt D., Shaikh S., Dou W., "Vulnerable to Misinformation? Verifi!", in 24th ACM Conference on Intelligent User Interfaces, Los Angeles, USA, Mar. 16-20 2019

16) Karduni A., Wesslen R., **Santhanam S.**, Cho I., Volkova S., Arendt D., Shaikh S., Dou W., "Can You Verifi This? Studying Uncertainty and Decision-Making about Misinformation in Visual Analytics", in 12th International AAAI Conference on Web and Social Media, Stanford, USA, Jun. 25-28 2018, (***Acceptance Rate**: 16%*)

17) **Santhanam S**., Srinivasan V., Glass S., Shaikh S., "I Stand With You: Using Emojis to Study Solidarity in Crisis Events", in Proceedings of 1st International Workshop on Emoji Understanding and Applications in Social Media (ICWSM), Stanford, USA, Jun. 25-28 2018, published by AAAI

18) **Santhanam S**., Shaikh S., "I Stand With You: Detecting and Characterizing Expressions of Solidarity in Social Media", in 4th International Conference on Computational Social Science (IC2S2), Chicago, USA, July. 12-15 2018

19) Cho I., Wesslen R., Karduni A., **Santhanam S.**, Shaikh, S., Dou, W., "The Anchoring Effect in Decision-Making with Visual Analytics", in 12th International IEEE Conference Visual Analytics Science and Technology, Phoenix, Arizona, Oct. 1-6 2017 (***Acceptance Rate**: 22% - 25%*)

Journal Publications

1) Srinivasan V., **Santhanam S**., Shaikh S., "Using Reinforcement Learning with External Rewards for Open-Domain Natural Language Generation", in Journal of Intelligent Information Systems, DOI: 10.1007/s10844-020-00626-5

2) **Santhanam. S**, Shaikh. S, "A Survey of Natural Language Generation Techniques with a Focus on Dialogue Systems - Past, Present and Future Directions", Arxiv 1906.00500

Poster Presentations

1) **Santhanam S**., Shaikh, S., "Salient Context Identification from Memory for Neural Dialog Systems", in 2nd Southern Data Science Conference, Atlanta, USA, Apr. 13-14 2019.

2) Dalton, A., Zemal, A., Masoumzadeh, A., Bhatia, A., Dorr, B., Mather, B., Hebenstreit, B., Al-Shaer, E., Khoja, E., Castillo, E.J., Bunch, L., Vlahovic, M., Liu, P., Pirolli, P., Shah, R., Cartacio, S., Shaikh, S., **Santhanam S**., Dhaduvai, S., Strzalkowski, T., Karimi, Y., "Modeling Social Engineering Risk using Attitudes, Actions, and Intentions Reflected in Language Use", in 32nd International FLAIRS Conference, Florida, USA, May. 19-22 2019. [Alphabetical Ordering]

3) **Santhanam S**., Shaikh, S., "Propaganda or Clickbait? Understanding and Classifying Types of Misinformation using Recurrent Neural Networks", in 1st Southern Data Science Conference, Atlanta, USA, Apr. 13-14 2018.

Press Coverage

1) **Santhanam S**., Shaikh, S., "Understanding the emoji of solidarity", in The Conversation, July 16, 2018

Awards/Scholarships

Deep Mind, Facebook, Center for Brains, Minds, and Machines at MIT [ICLR] Conference Registration Support	Virtual 2020
Visual Dialog - Best Project Award Conversational International Summer School	Lowell, MA 2019
Association for Advancement of Artificial Intelligence Graduate Travel Support	Stanford, CA 2017
University of North Carolina – Charlotte Graduate Assistant Support Plan (GASP)	Charlotte, NC 2017 – 2021

Professional Activities

1) Service

- Reviewer of **Emoji Conference 2019, 2020, 2021.**
- Reviewer of **NAACL 2019, 2021.**
- Reviewer of **ACL 2019, 2020, 2021.**
- Reviewer of **ACM CHI 2019.**
- Reviewer of **WiNLP 2019, 2020, 2021.**
- Reviewer of **AAAI 2019, 2020, 2021, 2022.**
- Reviewer of **ICML 2020.**
- Reviewer of **EMNLP 2019, 2020, 2021.**
- Reviewer of **EACL 2021.**
- Reviewer of **ICLR 2021, 2022.**
- Reviewer of **Neurips 2020, 2021.**
- Reviewer of **LREC 2022.**
- Reviewer of **DSTC 2021, 2022.**

2) Organizer

- Workshop on evaluating NLG evaluation at INLG 2020.
- Human Evaluation subcommittee of GEM benchmark.

3) Invited Lectures/Talks

- **The World of Conversational AI -** JP Morgan and Chase
- **Natural Language Processing** - Neural Networks for Natural Language Generation
- **Natural Language Processing** - Machine Translation
- **Computation Human Behavior Modeling (ITCS 8050/6050, PSYC-6099)** – Survey of Natural Language Generation Techniques
- **Applied Machine Learning -** Introduction to Reinforcement Learning

Skills

Technical: Natural Language Processing, Deep Learning, Machine Learning, Social media analysis, Cognitive Biases, Human Behavior Modeling
Programming Languages: Python, Java, C/C++, R
Framework: PyTorch, Tensorflow, scikit-learn, NLTK, Transformers
Data Analysis Software: Tableau, Alteryx, Pandas, Spacy, d3.js
Cloud Computing: AWS
Language: English, Tamil (native)

References

1) Dr. Samira Shaikh
Assistant Professor,
Department of Computer Science,
University of North Carolina at Charlotte,
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Phone: (704) 687-7022,
Email: sshaikh2@uncc.edu

2) Dr. Bonnie J Dorr
Associate Director and Senior Research Scientist, IHMC
Professor of Computer Science, West Florida (faculty associate)
Professor, University of Maryland College Park (emerita)
Professor, University of Florida (courtesy)
Email: bdorr@ihmc.org

3) Dr. Tomek Strzalkowski
Professor, Cognitive Science,
Rensselaer Polytechnic Institute,
Email: tomek@rpi.edu

4) Dr. Minwoo Lee
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5) Dr. Wlodek Zadrozny
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