

## RESEARCH AREAS

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**Primary Interest:** Natural Language Generation, with specific interests in style transfer, data-to-text generation, narrative generation and low-resource & creative NLG.

**Secondary Interest:** Data Augmentation, with specific interests in data augmentation for generation, data augmentation for evaluation and domain shift

## EDUCATION

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- **Language Technologies Institute, CMU** Pittsburgh, Pennsylvania  
PhD in Language Technologies; **GPA:** 3.97/4.33 Sep. 2016 – Ongoing
  - **Advisor:** Eduard Hovy
  - Key Courses: *Grammars & Lexicons, Machine Translation, Language Grounding For Vision & Control, Neural Networks For NLP, Algorithms for NLP, Deep Reinforcement Learning, Structured Prediction for NLP*
- **Indian Institute of Technology, Madras (IIT-M)** Chennai, India  
B.Tech/M.Tech. in Computer Science and Engineering; **CGPA:** 9.27/10 Aug. 2011 – May. 2016
  - **Advisor:** Balaraman Ravindran
  - Key Electives: *Machine Learning, NLP, Reinforcement Learning, Memory Based Reasoning, Searching & Indexing, Knowledge Representation, Distributed Algorithms, Ontologies, Graph Theory*
  - Core Courses: *Networks, Databases, Operating Systems, Automata Theory, Compilers, Algorithms*
  - **GRE:** 337/340 ( **Quant:** 170/170 **Verbal:** 167/170 **Analytical Writing:** 5.5/6)
  - **TOEFL:** 118/120 ( **Reading:** 30/30 **Writing:** 30/30 **Listening:** 30/30 **Speaking:** 28/30)

## PUBLICATIONS

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- Investigating Robustness of Dialog Models to Popular Figurative Language Constructs [PDF]  
*Authors: Harsh Jhamtani\*, Varun Gangal\*, Eduard Hovy, Taylor Berg-Kirkpatrick*  
Accepted for **EMNLP 2021**
- Coarse2Fine: Fine-grained Text Classification on Coarsely-grained Annotated Data [PDF]  
*Authors: Dheeraj Mekala, Varun Gangal, Jingbo Shang*  
Accepted for **EMNLP 2021**
- Retrieve, Caption, Generate: Visual Grounding for Enhancing Commonsense in Text Generators [PDF] [ArXiv]  
*Authors: Steven Feng, Kevin Lu, Zhuofu Tao, Malihe Alikhani, Teruko Mitamura, Eduard Hovy, Varun Gangal*  
Accepted for **Workshop on Commonsense Reasoning and KBs (CSKB) at AKBC 2021**
- SAPPHERE: Approaches for Enhanced Concept-to-Text Generation [PDF] [ArXiv] [CODE]  
*Authors: Steven Feng, Jessica Huynh, Chaitanya Narisetty, Eduard Hovy, Varun Gangal*  
Accepted for **INLG 2021**
- Automatic Construction of Evaluation Suites for Natural Language Generation Datasets [PDF] [ArXiv] [CODE]  
*Authors: Simon Mille, Kaustubh D Dhole, Saad Mahamood, Laura Perez, Varun Gangal, Mihir Kale, Emiel van Miltenburg, Sebastian Gehrmann*  
Accepted for **NeurIPS 2021 Datasets and Benchmarks Track**
- Improving Automated Evaluation of Open Domain Dialog via Diverse Reference Augmentation [PDF] [ArXiv] [CODE] [POSTER]  
*Authors: Varun Gangal\*, Harsh Jhamtani\*, Eduard Hovy, Taylor Berg-Kirkpatrick*  
Accepted for **Findings of ACL 2021**
- A Survey of Data Augmentation Approaches for NLP [PDF] [ArXiv] [REPO] [TALK (for Google Research)]  
*Authors: Steven Feng\*, Varun Gangal\*, Jason Wei, Sarath Chandar, Soroush Vosoughi, Teruko Mitamura, Eduard Hovy*  
Accepted for **Findings of ACL 2021**
- The GEM benchmark: Natural Language Generation, its Evaluation and Metrics [ArXiv] [CODE]  
*Authors: Sebastian Gehrmann, Tosin Adeyemi, ... Varun Gangal, ... (Multiple Authors)*

Preprint

- BERTing RAMS: What and How Much does BERT Already Know About Event Arguments? – A Study on the RAMS Dataset [[ArXiv](#)]  
*Authors: Varun Gangal, Eduard Hovy*  
Accepted for **BlackBoxNLP 2020 Workshop, EMNLP 2020**
- GenAug: Data Augmentation for Finetuning Text Generators [[ArXiv](#)] [[PDF](#)] [[CODE](#)] [[TALK](#)]  
*Authors: Steven Feng\*, Varun Gangal\*, Dongyeop Kang, Teruko Mitamura, Eduard Hovy*  
Accepted for **Deep Learning Inside Out Workshop, EMNLP 2020**
- SCDE: Sentence Cloze Dataset with High Quality Distractors From Examinations [[PDF](#)] [[DATA](#)] [[CODE](#)]  
*Authors: Xiang Kong\*, Varun Gangal\*, Eduard Hovy*  
Accepted for **ACL 2020, Seattle**
- Likelihood Ratios and Generative Classifiers For Unsupervised OOD Detection In Task-Based Dialog [[PDF](#)] [[DATA](#)]  
*Authors: Varun Gangal, Abhinav Arora, Arash Einolghozati, Sonal Gupta*  
Accepted for **AAAI 2020, New York City**
- (Male, Bachelor) and (Female, Ph.D) have different connotations: Parallely Annotated Stylistic Language Dataset with Multiple Personas [[PDF](#)] [[CODE+DATA](#)] [[PRESENTATION](#)]  
*Authors: Dongyeop Kang, Varun Gangal, Eduard Hovy*  
Accepted for **EMNLP 2019, Hong Kong**
- Learning to Generate Move-by-Move Commentary for Chess Games [[PDF](#)] [[POSTER](#)]  
*Authors: Harsh Jhamtani\*, Varun Gangal\*, Eduard Hovy, Graham Neubig, Taylor Berg-Kirkpatrick*  
Accepted for **ACL 2018, Melbourne**
- Charmanteau: Character Embedding Models For Portmanteau Creation [[ARXIV](#)][[DEMO](#)][[CODE](#)][[DATA](#)]  
*Authors: Varun Gangal\*, Harsh Jhamtani\*, Graham Neubig, Eduard Hovy, Eric Nyberg*  
Accepted for **EMNLP 2017, Copenhagen**
- Detecting and Explaining Causes From Text For a Time Series Event [[ARXIV](#)]  
*Authors: Dongyeop Kang, Varun Gangal, Ang Lu, Zheng Chen, Eduard Hovy*  
Accepted for **EMNLP 2017, Copenhagen**
- Shakespearizing Modern Language Using Copy-Enriched Sequence-to-Sequence Models [[ARXIV](#)][[CODE](#)]  
*Authors: Harsh Jhamtani\*, Varun Gangal\*, Eduard Hovy, Eric Nyberg*  
Accepted for **EMNLP 2017 Workshop on Stylistic Variation, Copenhagen**
- HEMI: Hyperedge Majority Influence Maximization [[PDF](#)]  
*Authors: Varun Gangal, Balaraman Ravindran, Ramasuri Narayanam*  
Accepted for **The Second IJCAI Workshop on Social Influence Analysis (SocInf 2016), New York**
- Trust And Distrust Across Coalitions: Shapley Value Centrality Measures For Signed Networks [[PDF](#)]  
*Authors: Varun Gangal, Abhishek Narwekar, Balaraman Ravindran, Ramasuri Narayanam*  
Accepted for **NIPS 2015 Workshop on Networks In the Social And Information Sciences**

## ABSTRACTS

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- Personifications are Cunning: Exploring Approaches For Personification Identification [[ABSTRACT PDF](#)]  
*Authors: Kevin Lu, Steven Feng, Varun Gangal, Harsh Jhamtani, Eduard Hovy*  
Accepted for **New Directions in Analyzing Text as Data (TADA) 2021**
- Trust And Distrust Across Coalitions: Shapley Value Centrality Measures For Signed Networks [[PDF](#)]  
*Authors: Varun Gangal, Abhishek Narwekar, Balaraman Ravindran, Ramasuri Narayanam*  
Accepted for **AAAI Student Abstract 2016**

## PREPRINTS

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- The GEM benchmark: Natural Language Generation, its Evaluation and Metrics [[ArXiv](#)] [[CODE](#)]  
*Authors: Sebastian Gehrmann, Tosin Adevumi, ... Varun Gangal, ... (Multiple Authors)*  
Preprint

## REVIEWING EXPERIENCE

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- ACL Rolling Review
- ACL 2019, Generation Track & Machine Learning Track
- EMNLP 2019, Generation Track
- AAAI 2020, Main Track, Natural Language Processing
- ACL 2020, Generation Track
- COLING 2020, Generation Track
- HAMLETS 2020 WS, NEURIPS 2020

## PROFESSIONAL EXPERIENCE

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- **Unsupervised OOD Detection For Task Based Dialog** Facebook Conversational AI, Menlo Park, CA  
Mentors : [Sonal Gupta](#), [Arash Einolghozati](#), Abhinav Arora May – August 2019
  - Task-based dialog systems on deployment often get user inputs which aren't actually intents pertaining to any domain, such as rhetorical remarks, subjective questions and ill-specified search queries.
  - If not filtered, these inputs can wreak havoc on downstream components like slot detection. Furthermore, it is infeasible to curate training data for these "OOD" inputs. Hence, we need unsupervised approaches to detect these at test-time jointly with intent classification.
  - We explore **likelihood ratio** with a **background** likelihood as an alternative to plain likelihood. We find this to consistently improve OOD detection for multiple types of likelihood functions.
  - We propose learning a **generative classifier** and computing a marginal likelihood (ratio) for OOD detection. This outperforms approaches based on simple likelihood as well as discriminative classifiers.
  - Accepted at AAAI 2020
- **Operation-Factored Models For Better Abstractive Summarization** AI2, Semantic Scholar, Seattle  
Mentor : [Iz Beltagy](#) May – July 2021
  - We investigate the question of whether explicit operation-generating modules overlaid over state of the art abstractive summarizers confer better factuality and greater user controllability.
- **Centrality and Influence in Unconventional Social Networks** IBM Research, India  
Mentor : [Ramasuri Narayanam](#) May – July 2015
  - Worked on centrality measures for signed networks, multiplex networks and hypergraphs.
- **Building Ad Customer Profile Using ML (CUPRUM)** Bing Ads Team, Microsoft India  
Mentor : [Prashant Rajoria](#) May – July 2014
  - Worked on building models of various aspects of Bing advertisers such as spamminess, malware and serveability using supervised machine learning methods, based on features from their ad pages.

## RESEARCH MENTORSHIP/ADVISING EXPERIENCE

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- Kevin Lu - Univ of Waterloo Undergrad, CS, Class of 2026 June-Sept 2021
- Zhuofu Tao - UCLA 1st Year PhD, CS June-Sept 2021
- Dheeraj Mekala - Univ of San Diego Masters, CS, Class of 2021 Jan-Sept 2021
- Sedrick Keh - CMU Masters, Machine Learning, Class of 2023 Sept- 2021

## TEACHING EXPERIENCE

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- Teaching Assistant - Neural Networks For NLP, Spring 2018 CMU
- Teaching Assistant - Grammars & Lexicons, Fall 2017 CMU
- Teaching Assistant - Machine Learning MOOC, Spring 2016 NPTEL & IIT Madras
- Teaching Assistant - Reinforcement Learning, Spring 2016 IIT Madras