Saadia K. Gabriel

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**Education:**

**University of Washington**  
PhD in Computer Science & Engineering, advised by Prof. Yejin Choi  
Fall 2017 – Current

**Mount Holyoke College, Summa Cum Laude**  
BA in Computer Science & Mathematics  
Thesis Adviser: Prof. Dan Sheldon  
May 2017

**Honors and Achievements:**

- MSR Ada Lovelace Fellowship Nomination (Fall 2018)
- CRA-W Grad Cohort Workshop Participant (Spring 2018)
- CRA URMD Grad Cohort Workshop Participant (Spring 2018)
- Phi Beta Kappa (May 2017)
- Weaver Award for Computer Science and Math (May 2017)
- David Notkin Endowed Graduate Fellowship in Computer Science & Engineering (March 2017)
- ARCS Foundation Fellowship (March 2017)
- Class of 1937 Prize in Math for outstanding achievement as a junior (May 2016)
- Sarah Williston Prize for top 5 students in class of 2017 (November 2015)
- Mildred L. Sanderson Prize for excellence in Mathematics (Spring 2014)

**Publications and Presentations:**

- Co-opNet: Cooperative Generator-Discriminator Networks for Abstractive Summarization with Narrative Flow  
  Saadia Gabriel; Antoine Bosselut; Ari Holtzman; Kyle Lo; Asli Celikyilmaz; Yejin Choi  
  arXiv preprint 2019
- Social Bias Frames: Reasoning about Social and Power Implications of Language  
  Maarten Sap; Saadia Gabriel; Lianhui Qin; Dan Jurafsky; Noah A. Smith; Yejin Choi  
  arXiv preprint 2019
- Detecting and Tracking Communal Bird Roosts in Weather Radar Data  
  Zezhou Cheng; Saadia Gabriel; Pankaj Bambhani; Daniel Sheldon; Subhransu Maji; Andrew Laughlin; David Winkler  
  AAAI 2020 (Social Impact Track)
- The Risk of Racial Bias in Hate Speech Detection  
  Maarten Sap; Dallas Card; Saadia Gabriel; Yejin Choi; Noah A. Smith  
  ACL 2019 – Best Short Paper Nominee
- MathQA: Towards Interpretable Math Word Problem Solving with Operation-Based Formalisms  
  Aida Amini; Saadia Gabriel; Shanchuan Lin; Rik Koncel-Kedziorski; Yejin Choi; Hannaneh Hajishirzi  
  NAACL 2019
- Early Fusion for Goal Directed Robotic Vision  
  Aaron Walsman; Yonatan Bisk; Saadia Gabriel; Dipendra Misra; Yoav Artzi; Yejin Choi; Dieter Fox  
  IROS 2019 – Best Paper Nominee
- Ruling the Roost with CNNs: Detecting and Tracking Communal Bird Roosts in Weather Radar Data  
  Zezhou Cheng; Saadia Gabriel; Pankaj Bambhani; Daniel Sheldon; Subhransu Maji; Andrew Laughlin; David Winkler  
  Fine-Grained Visual Categorization Workshop (FGVCS) at CVPR 2018
Recent Research Projects:

Cooperative Generator-Discriminator Networks
Collaborators: Antoine Bosselut (UW/Ai2), Ari Holtzman (UW/Ai2), Asli Celikyilmaz (MSR)

In this work, we introduce a new Transformer-based architecture for large-scale abstractive summarization of scientific papers that incorporates an inherent notion of coherent narrative flow. Additionally, we present a new dataset for natural language generation tasks extracted from arXiv. We show how the dataset challenges state-of-the-art summarization models, including pointer-generator networks and reinforcement learning-based models.

Social Bias Frames
Collaborators: Maarten Sap (UW), Lianhui Qin (UW/Ai2), Prof. Noah Smith (UW/Ai2), Prof. Dan Jurafsky (Stanford)

In this project, we present an adversarial crowdsourcing framework for dynamically training models to classify toxic language in social media. The framework trains models dynamically through the use of adversarial crowdsourcing. We reason about biases and implied stereotypes in social media posts through the use of structured annotations that consider audience vs. poster perspectives and targeted demographics.

MathQA
Collaborators: Aida Amini (UW), Rik Koncel-Kedziorski (UW), Prof. Hannaneh Hajishirzi (UW/Ai2)

We develop a neural network architecture to solve complex math word problems through generation of natural language explanations. The neural network predicts which chain of actions lead to a word problem’s final solution by leveraging word knowledge to predict sequences of operators. We also introduce a new dataset (MathQA) and representation language that aligns word problems with action sequences to test the performance of neural networks at logical reasoning.

Experience:

Ai2 Research Intern (Fall 2019 – Current)
• Working on extracting and integrating commonsense knowledge as a member of the Mosaic team led by Yejin Choi

Computer Vision & Learning Intern, SRI International (Summer 2019)
• Working with Ajay Divakaran and Karan Sikka on using pre-trained models for commonsense knowledge extraction and integrating commonsense knowledge into multimodal applications of NLP, including visual question answering and generation

Graduate Research Assistant, University of Washington (Fall 2017 – Current)
• Researching machine learning techniques and implementing deep-learning models for natural language understanding, social commonsense and logical reasoning in text
• Investigating ways of representing effects of actions in stories dependent on logical reasoning, like math word problems

Data Science Research Assistant, University of Massachusetts Amherst (Summer 2016)
• Developed computer vision models to identify bird roosts in radar data
• Worked with SQL and JavaScript to display results of roost detection in web application
• Participated in UMass College of Information and Computer Sciences poster presentation

GEM CS Mentor (Google-Funded Program), Mount Holyoke College (Spring 2016)
• Developed an active learning plan for Intro to Object-Oriented Programming class
• Mentored students and gave feedback in CS 101 lab
• Reviewed students' code and gave feedback on assignments
REU Research Assistant, University of Massachusetts Amherst (Summer 2015)
- Analyzed large datasets using Python and Matlab
- Developed parametric model to identify birds in radar data
- Presented research to technical and non-technical audiences

Wearable Electronics Inventor (2013 – Current)
- Created a jacket called The Turtle that charges mobile devices
- Gave a presentation on The Turtle and wearable technology for Computer Science Week at Mount Holyoke in Fall 2013

CS Educator (2012 – Current)
- Developed interactive movie application for teaching intro computer science and discrete mathematics to beginning students using hand-drawn animation

Teaching:
- TA for Real Analysis (Math 301), Mount Holyoke College

Service:
- Secondary Reviewer for ICLR
- Secondary Reviewer for EMNLP
- PC for ACL 2019 SRW
- PC for NAACL 2019 SRW, NeuralGen and WNU workshops
- UW NLP Retreat Organizer (2018, 2019)
- Mount Holyoke College CS Department Chair Student Search Committee (2016 - 2017)

Selected Talks:
- Mount Holyoke Computer Science Week
  The Turtle: A Solar-powered Jacket for Charging Mobile Devices – December 2013
- Undergrad Thesis Defense
  Modeling Swallow Roosts Using Weather Radar – May 2017
- MSR 2018 PhD Summit Poster Session
  Neural Detox – October 2018
- MSR 2019 PhD Summit Poster Session
  Universal Frameworks for Commonsense Knowledge Integration – October 2019
- UW Quals Talk
  Co-opNet: Cooperative Generator-Discriminator Networks – October 2019
- Invited Talk at Carlson School of Management
  NLP State-of-the-Art Methods – November 2019
- Invited Talk at Mount Holyoke College
  MathQA to Co-opNet: Can We Teach NLP Models to Reason? – November 2019

Skills:

Programming: Python, Java, Matlab, R, ActionScript, HTML, C, JavaScript, SQL
Language: English (Native Speaker), French (Intermediate), Russian (Beginner)