

# Subhro Roy

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## CONTACT INFORMATION

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## POSITIONS

**Principal Researcher**, Microsoft Semantic Machines, Mar 2023 - present

**Senior Researcher**, Microsoft Semantic Machines, Oct 2019 - Mar 2023

**Postdoctoral Associate**, Massachusetts Institute of Technology, Aug 2017 - Sep 2019

## EDUCATION

**University of Illinois, Urbana Champaign**

Ph.D., Computer Science, 2017

Thesis: Reasoning about Quantities in Natural Language

Advisor: Prof. Dan Roth

**Indian Institute of Technology, Kharagpur**

B.Tech, Computer Science and Engineering, 2012

## EXPERIENCE

**Tech Lead, Foundation Model for User Actions in Office 365, Microsoft Semantic Machines** Mar 2023 - present

- Led a team of 25 researchers and engineers to build a foundation model for user actions in Microsoft Office 365. Developed research vision and provided guidance for research exploration for the team.
- Co-ordinated with numerous teams across Office 365 to develop data pipelines which can support training and shipping our foundation model on search and recommendation tasks.
- Shipped our model to power file recommendations for Microsoft employees and work is underway to ship it world wide.

**Researcher, Scaling Dialogue Agent to New Domains, Microsoft Semantic Machines** Oct 2019 - Mar 2023

- Developed and open sourced low resource semantic parsing solutions using LLMs; released benchmark system to allow easy evaluation of new LLMs on semantic parsing.
- Built a scalable data collection system powered by LLM semantic parser for new domains for the Semantic Machines bot.

**Postdoctoral Associate, Massachusetts Institute of Technology** Aug 2017 - Sep 2019

- Represented MIT in Robotics Collaborative Technology Alliance (RCTA) project funded by the US Army Research Labs to develop intelligence for human-robot teams in army scenarios. Developed the language understanding component allowing for voice commanding of robots. Collaborated with several academic and research institutions to develop end-to-end robotic systems.
- Represented CSAIL MIT at the Reading the Mind with Language and Vision project funded by Toyota Research Institute targeting home service robots. Developed language grounding and high level planning systems for indoor robots.

## CONFERENCE PUBLICATIONS

*ZeroTOP: Zero-Shot Task-Oriented Semantic Parsing using Large Language Models*

Dheeraj Mekala, Jason Wolfe, **Subhro Roy**

EMNLP 2023

*BenchCLAMP: A Benchmark for Evaluating Language Models on Semantic Parsing*

**Subhro Roy**, Sam Thomson, Tongfei Chen, Richard Shin, Adam Pauls, Jason Eisner, Benjamin Van Durme

NeurIPS 2023 Datasets and Benchmarks Track

*Addressing Resource and Privacy Constraints in Semantic Parsing Through Data Augmentation*

Kevin Yang, Olivia Deng, Charles Chen, Richard Shin, **Subhro Roy**, Benjamin Van Durme

Findings of ACL 2022

*Constrained Language Models Yield Few-Shot Semantic Parsers*

Richard Shin, Christopher H. Lin, Sam Thomson, Charles Chen, **Subhro Roy**, Emmanouil Antonios Platanios, Adam Pauls, Dan Klein, Jason Eisner, Benjamin Van Durme  
EMNLP 2021

*Value-Agnostic Conversational Semantic Parsing*

Emmanouil Antonios Platanios, Adam Pauls, **Subhro Roy**, Yuchen Zhang, Alex Kyte, Alan Guo, Sam Thomson, Jayant Krishnamurthy, Jason Wolfe, Jacob Andreas, Dan Klein  
ACL 2021

*An Intelligent Architecture for Grounded Language Communication with Field Robots*

T. Howard, N. Roy, J. Fink, J. Arkin, R. Paul, D. Park, **S. Roy**, D. Barber, R. Bendell, K. Schmeckpeper, J. Tian, J. Oh, M. Wigness, L. Quang, B. Rothrock, J. Nash, M. Walter, F. Jentsch, E. Stump  
Field Robotics 2021

*Task-Oriented Dialogue as Dataflow Synthesis\*\**

J. Andreas, J. Bufe, D. Burkett, C. Chen, J. Clausman, J. Crawford, K. Crim, J. DeLoach, L. Dorner, J. Eisner, H. Fang, A. Guo, D. Hall, K. Hayes, K. Hill, D. Ho, W. Iwaszuk, S. Jha, D. Klein, J. Krishnamurthy, T. Lanman, P. Liang, C. H. Lin, I. Lintsbakh, A. McGovern, A. Nisnevich, A. Pauls, D. Petters, B. Read, D. Roth, **S. Roy**, J. Rusak, B. Short, D. Slomin, B. Snyder, S. Striplin, Y. Su, Z. Tellman, S. Thomson, A. Vorobev, I. Witoszko, J. Wolfe, A. Wray, Y. Zhang and A. Zotov  
TACL 2020

*Multimodal estimation and communication of latent semantic knowledge for robust execution of robot instructions*

Jacob Arkin, Daehyung Park, **Subhro Roy**, Matthew R Walter, Nicholas Roy, Thomas Howard, Rohan Paul  
IJRR 2020

*Inferring Task Goals and Constraints using Bayesian Nonparametric Inverse Reinforcement Learning*

Daehyung Park, Michael Noseworthy, Rohan Paul, **Subhro Roy**, and Nicholas Roy  
CoRL 2019

*Task-Conditioned Variational Autoencoders for Learning Movement Primitives*

Michael Noseworthy, Rohan Paul, **Subhro Roy**, Daehyung Park and Nicholas Roy  
CoRL 2019

*Leveraging Past References for Robust Language Grounding*

**Subhro Roy\***, Michael Noseworthy\*, Rohan Paul, Daehyung Park and Nicholas Roy  
CoNLL 2019

*Mapping to Declarative Knowledge for Word Problem Solving*

**Subhro Roy** and Dan Roth  
TACL 2018

*Grounding Robot Plans from Natural Language Instructions with Incomplete World Knowledge*

Daniel Nyga\*, **Subhro Roy\***, Rohan Paul\*, Daehyung Park, Mihai Pomarlan, Michael Beetz and Nicholas Roy  
CoRL 2018

*Real-Time Human-Robot Communication for Manipulation Tasks in Partially Observed Environments*

Jacob Arkin, Rohan Paul, Daehyung Park, **Subhro Roy**, Nicholas Roy and Thomas M. Howard  
ISER 2018

*CogCompNLP: Your Swiss Army Knife for NLP*

D. Khashabi, M. Sammons, B. Zhou, T. Redman, C. Christodoulopoulos, V. Srikumar, N. Rizzolo, L. Ratnoff, G. Luo, Q. Do, C. Tsai, **S. Roy**, S. Mayhew, Z. Feng, J. Wieting, X Yu, Y. Song, S. Gupta, S. Upadhyay, N. Arivazhagan, Q. Ning, S. Ling and D. Roth  
LREC 2018

*Unit Dependency Graph and its Application to Arithmetic Word Problem Solving*

**Subhro Roy** and Dan Roth

AAAI 2017

*Equation Parsing: Mapping Sentences to Grounded Equations*

**Subhro Roy**, Shyam Upadhyay and Dan Roth

EMNLP 2016

*Approximating the Maximum Overlap of Polygons under Translation\*\**

Sariel Har-Peled and **Subhro Roy**

Algorithmica 2016

*MAWPS: A Math Word Problem Repository*

Rik Koncel-Kedziorski\*, **Subhro Roy**\*, Aida Amini, Nate Kushman and Hannaneh Hajishirzi

NAACL 2016

*Solving General Arithmetic Word Problems*

**Subhro Roy** and Dan Roth

EMNLP 2015

*Reasoning about Quantities in Natural Language*

**Subhro Roy**, Tim Vieira and Dan Roth

TACL 2015

*Approximating the Maximum Overlap of Polygons under Translation\*\**

Sariel Har-Peled and **Subhro Roy**

ESA 2014

*Learning for Mining Outlier Subgraphs from Network Datasets*

M. Gupta, A. Mallya, **S. Roy**, J. Cho, J. Han

SDM 2014

\* denotes equal contribution

\*\* denotes author names in alphabetical order

#### INTERNSHIPS

**Allen Institute for Artificial Intelligence, Seattle**

**May-Jul 2016**

Supervisor : Mark Hopkins

Developed open domain algebra word problem solver.

**Microsoft Research, Redmond, USA**

**May-Aug 2015**

Supervisor : Scott Yih, Ming-wei Chang, Chris Meek

Developed relation extraction systems for knowledge base completion.

**Google, Mountain View, USA**

**May-Aug 2014**

Supervisor : J.D. Chen

Built a system to automatically classify reviews for apps.

#### MEDIA

*Software teaches computers to translate words to math*

Illinois News Bureau

Link: <https://news.illinois.edu/view/6367/204435>

HONOURS AND  
AWARDS

- **List of Teachers Ranked as Outstanding** by Their Students, UIUC, Spring 2017.
- **List of Teachers Ranked as Excellent** by Their Students, UIUC, Fall 2013.
- Felicitated by the **Governor of West Bengal** for securing 2nd position in the state in ICSE 2006, and 5th position in ISC 2008 Examination.
- Selected among top 30 students from the state of West Bengal in **Indian National Mathematical Olympiad, 2007**
- Selected among top 1% students from all over India in **Indian National Chemistry Olympiad, 2007**
- Secured 2nd position in **Yahoo HackU** contest. Developed an online **Railway Reservation system** for Indian Railways
- Recipient of the **Kishore Vaigyanik Protsahan Yojana (KVPY) Scholarship**, awarded by the Department of Science and Technology, Government of India, 2006
- Recipient of **O.P.Jindal Engineering and Management Scholarship (OPJEMS), 2010**
- Recipient of **Goralal Syngal Memorial Scholarship**, IIT Kharagpur

TEACHING  
EXPERIENCE

- **Teaching Assistant** for Machine Learning, Spring 2017
- **Teaching Assistant** for Undergraduate Algorithms, Fall 2013
- **Teaching Assistant** for Undergraduate Algorithms, Spring 2013
- **Teaching Assistant** for Ethical and Professional Issues in CS course, Fall 2012