Panupong (Ice) Pasupat

ppasupat@cs.stanford.edu | (+1) 857-919-5187 | https://ppasupat.github.io

Education

Stanford University **Stanford, CA**
Ph.D. in Computer Science 2013–2019
Advisor: Percy Liang
Dissertation Title: Natural Language Interfaces for Semi-Structured Web Pages

Massachusetts Institute of Technology **Cambridge, MA**
B.S. in Electrical Engineering and Computer Science 2009–2013
B.S. in Mathematics (double major)
GPA: 5.0 / 5.0

Work Experience

Google AI, Google **Mountain View, CA**
Research Scientist 2019–present
- Conducted research on semantic parsing, retrieval-augmented models, and few-shot learning.
- Led a collaboration with Google Assistant to improve their semantic parsers.
- Supervised Ph.D. research interns.

Facebook Conversational AI, Facebook **Menlo Park, CA**
Research Intern 2018
- Improved a neural shift-reduce model for parsing sentences into a hierarchical semantic representation.
- Analyzed errors and designed novel top-down and bottom-up parsing algorithms to address the errors.

Google Research, Google **Mountain View, CA**
Software Engineering Intern 2015
- Developed deep learning models in TensorFlow for paraphrase detection.
- Proposed negative sampling methods using linguistic resources to better distinguish closely related words.
- Demonstrated how appropriate combinations of model choices and negative samplers improve the accuracy.

Speech and Dialog Research Group, Microsoft Research **Mountain View, CA**
Research Intern 2014
- Bootstrapped classifiers for detecting knowledge base relations in spoken queries in an unsupervised fashion.
- Mined queries from search engine query click logs and automatically labeled relations using distant supervision from knowledge graphs.

Natural Language Processing Lab, Tokyo Institute of Technology **Yokohama, Japan**
Exchange Student 2013
- Experimented on Tweet sentiment analysis using different classifiers and features.
- Applied structural correspondence learning to incorporate unlabeled data.

Spoken Language Systems Group, MIT CSAIL Lab **Cambridge, MA**
Researcher Intern 2012–2013
- Designed web interfaces on Amazon Mechanical Turk to collect spoken sentences and their semantic labeling.
- Trained sequence tagging models by implementing features for conditional random fields, resulting in English and Chinese models for categorizing words in speech queries.
- Deployed the models in speech-enabled mobile applications for movie, flight, and restaurant recommendations.

Dropbox Inc. **San Francisco, CA**
Engineering Intern 2011
- Wrote scripts to periodically analyze the usage pattern of Dropbox users. Investigated methods to optimize data calculation and caching for the analytics team.
- Implemented bug filtering and email notification system in the error log viewer, making critical errors get noticed and fixed faster.

Reflective Commonsense Thinking, MIT Media Lab **Cambridge, MA**
Researcher Intern 2010
- Implemented algorithms to solve error-correcting subgraph isomorphism and analogical matching problems.
- Applied the algorithms on analogy problems, enabling the system to make decisions based on past experiences.

Language of Thought, MIT Department of Linguistics **Cambridge, MA**
Researcher Intern 2010
- Designed algorithms to automatically measure vowel formant frequencies from sound files in order to observe the patterns and constraints of vowels in spoken languages.
- Designed experiments on Amazon Mechanical Turk to study sound constraints during language acquisition.

Publications

Attributed Text Generation via Post-hoc Research and Revision
Luyu Gao, Zhuyun Dai, Panupong Pasupat, Anthony Chen, Arun Tejasvi Chaganty, Yicheng Fan, Vincent Y. Zhao, Ni Lao, Hongrae Lee, Da-Cheng Juan, Kelvin Guu
arXiv preprint, 2022

Evaluating the Impact of Model Scale for Compositional Generalization in Semantic Parsing
Linlu Qiu, Peter Shaw, Panupong Pasupat, Tianze Shi, Jonathan Herzig, Emily Pitler, Fei Sha, Kristina Toutanova
Empirical Methods in Natural Language Processing (EMNLP), 2022

Meta-Learning Fast Weight Language Models
Kevin Clark, Kelvin Guu, Ming-Wei Chang, Panupong Pasupat, Geoffrey Hinton, Mohammad Norouzi
Empirical Methods in Natural Language Processing (EMNLP), 2022

Generate-and-Retrieve: Use Your Predictions to Improve Retrieval for Semantic Parsing
Yury Zemlyanskiy, Michiel de Jong, Joshua Ainslie, Panupong Pasupat, Peter Shaw, Linlu Qiu, Sumit Sanghai, Fei Sha
International Conference on Computational Linguistics (COLING), 2022

Improving Compositional Generalization with Latent Structure and Data Augmentation
Linlu Qiu*, Peter Shaw*, Panupong Pasupat, Pawel Nowak, Tal Linzen, Fei Sha, Kristina Toutanova
North American Chapter of the Association for Computational Linguistics (NAACL), 2022

Controllable Semantic Parsing via Retrieval Augmentation
Panupong Pasupat, Yuan Zhang, Kelvin Guu
Empirical Methods in Natural Language Processing (EMNLP), 2021

Graph-Based Decoding for Task Oriented Semantic Parsing
Jeremy Cole, Nanjiang Jiang, Panupong Pasupat, Luheng He, Peter Shaw
Empirical Methods in Natural Language Processing (EMNLP) Findings, 2021

QA-Driven Zero-shot Slot Filling with Weak Supervision Pretraining
Xinya Du, Luheng He, Qi Li, Dian Yu, Panupong Pasupat, Yuan Zhang
Association for Computational Linguistics (ACL), 2021

Unlocking Compositional Generalization in Pre-trained Models Using Intermediate Representations
Jonathan Herzig, Peter Shaw, Ming-Wei Chang, Kelvin Guu, Panupong Pasupat, Yuan Zhang
arXiv preprint, 2021

Few-shot Intent Classification and Slot Filling with Retrieved Examples
Dian Yu, Luheng He, Yuan Zhang, Xinya Du, Panupong Pasupat, Qi Li
North American Chapter of the Association for Computational Linguistics (NAACL), 2021

Compositional Generalization and Natural Language Variation: Can a Semantic Parsing Approach Handle Both?
Peter Shaw, Ming-Wei Chang, Panupong Pasupat, Kristina Toutanova
Association for Computational Linguistics (ACL), 2020

REALM: Retrieval-Augmented Language Model Pre-Training
Kelvin Guu*, Kenton Lee*, Zora Tung, Panupong Pasupat, Ming-Wei Chang
International Conference on Machine Learning (ICML), 2020

SPoC: Search-based Pseudocode to Code
Sumith Kulal*, Panupong Pasupat*, Kartik Chandra, Mina Lee, Oded Padon, Alex Aiken, Percy Liang
Conference on Neural Information Processing Systems (NeurIPS), 2019

Span-based Hierarchical Semantic Parsing for Task-Oriented Dialog
Panupong Pasupat, Sonal Gupta, Karishma Mandyam, Rushin Shah, Mike Lewis, Luke Zettlemoyer
Empirical Methods on Natural Language Processing (EMNLP), 2019

Improving Semantic Parsing for Task Oriented Dialog
Arash Einolghozati, Panupong Pasupat, Sonal Gupta, Rushin Shah, Mrinal Mohit, Mike Lewis, Luke Zettlemoyer
Conversational AI Workshop at NeurIPS, 2018

Mapping Natural Language Commands to Web Elements
Panupong Pasupat, Tian-Shun Jiang, Evan Liu, Kelvin Guu, Percy Liang
Empirical Methods on Natural Language Processing (EMNLP), 2018

Reinforcement Learning on Web Interfaces using Workflow-Guided Exploration
Evan Zheran Liu*, Kelvin Guu*, Panupong Pasupat*, Tianlin Shi, Percy Liang
International Conference on Learning Representations (ICLR), 2018

Macro Grammars and Holistic Triggering for Efficient Semantic Parsing
Yuchen Zhang, Panupong Pasupat, Percy Liang
Empirical Methods on Natural Language Processing (EMNLP), 2017

From Language to Programs: Bridging Reinforcement Learning and Maximum Marginal Likelihood
Kelvin Guu, Panupong Pasupat, Evan Zheran Liu, Percy Liang
Association for Computational Linguistics (ACL), 2017

Inferring Logical Forms From Denotations
Panupong Pasupat, Percy Liang
Association for Computational Linguistics (ACL), 2016

Simpler Context-Dependent Logical Forms via Model Projections
Reginald Long, Panupong Pasupat, Percy Liang
Association for Computational Linguistics (ACL), 2016

Compositional Semantic Parsing on Semi-Structured Tables
Panupong Pasupat, Percy Liang
Association for Computational Linguistics (ACL), 2015

Unsupervised Relation Detection Using Automatic Alignment of Query Patterns Extracted from Knowledge Graphs and Query Click Logs
Panupong Pasupat, Dilek Hakkani-Tür
Interspeech, 2015

Zero-Shot Entity Extraction from Web Pages
Panupong Pasupat, Percy Liang
Association for Computational Linguistics (ACL), 2014

Query Understanding Enhanced by Hierarchical Parsing Structures
Jingjing Liu, Panupong Pasupat, Yining Wang, Scott Cyphers, Jim Glass
Automatic Speech Recognition and Understanding Workshop (ASRU), 2013

ASGARD: a Portable Architecture for Multilingual Dialogue Systems
Jingjing Liu, Panupong Pasupat, Scott Cyphers, Jim Glass
International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2013

A Conversational Movie Search System Based on Conditional Random Fields
Jingjing Liu, Scott Cyphers, Panupong Pasupat, Ian Mcgraw, Jim Glass
Interspeech, 2012

Honors and Awards

Putnam Mathematical Competition
Ranked 23rd — 2009

International Olympiad in Informatics (IOI)
Gold Medal (Ranked 2nd) — 2008

International Mathematical Olympiad (IMO)
Gold Medal 2007
2 Silver Medals 2005, 2006

Teaching Experience

Information Retrieval and Web Search (CS 276) **Stanford University**
Head Course Assistant Spring 2016

Artificial Intelligence: Principles and Techniques (CS 221) **Stanford University**
Head Course Assistant Fall 2014

Services

International Conference on Computational Linguistics (COLING)
Area Chair (Question Answering and Inference track) 2022

Empirical Methods on Natural Language Processing (EMNLP)
Area Chair (Semantics track) 2021

North American Chapter of the Association for Computational Linguistics (NAACL)
Website Chair 2021, 2022

Conference Reviewer
Transactions of the Association for Computational Linguistics (TACL), 2022
Empirical Methods on Natural Language Processing (EMNLP), 2022
Natural Language Processing for Programming (NLP4Prog), 2021
North American Chapter of the Association for Computational Linguistics (NAACL), 2021
Machine Reading for Question Answering (MRQA), 2021
Conference on Automated Knowledge Base Construction (AKBC), 2021
Association for Computational Linguistics (ACL), 2021
European Chapter of the Association for Computational Linguistics (EACL), 2021
Empirical Methods on Natural Language Processing (EMNLP), 2020
International Conference on Computational Linguistics (COLING), 2020
Widening Natural Language Processing (WiNLP), 2020
Conference on Automated Knowledge Base Construction (AKBC), 2020
Association for Computational Linguistics (ACL), 2020
International Conference on Learning Representations (ICLR), 2020
Association for the Advancement of Artificial Intelligence (AAAI), 2020
North American Chapter of the Association for Computational Linguistics (NAACL), 2019
Conference on Natural Language Learning (CoNLL), 2019
Empirical Methods on Natural Language Processing (EMNLP), 2019
Conference on Automated Knowledge Base Construction (AKBC), 2019
Joint Conference on Lexical and Computational Semantics (*SEM), 2019
Association for Computational Linguistics (ACL), 2018
Joint Conference on Lexical and Computational Semantics (*SEM), 2018
Empirical Methods on Natural Language Processing (EMNLP), 2017
Joint Conference on Lexical and Computational Semantics (*SEM), 2017

Association for Computational Linguistics (ACL), 2017
Association for Computational Linguistics (ACL), 2016
Empirical Methods on Natural Language Processing (EMNLP), 2015

International Mathematical Olympiad (IMO) **Chiang Mai, Thailand**
Coordinator and Grader 2015

Skills

Programming: fluent in Python (TensorFlow, PyTorch), Java, JavaScript

Languages: Thai (native), English (fluent), Japanese (intermediate), Chinese (beginner)