KEVIN YANG
CURRICULUM VITAE

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EDUCATION

Ph.D. in Artificial Intelligence *2019-*
UC Berkeley
Advisor: Prof. Dan Klein

M.Eng., Computer Science *2018-2019*
MIT
Advisor: Prof. Regina Barzilay
Thesis: *Are Learned Molecular Representations Ready for Prime Time?*

B.S, Computer Science and Mathematics *2015-2019*
MIT
Double major; GPA 5.0/5.0

RESEARCH INTERESTS

I am broadly interested in planning and control methods for natural language and/or structured settings, especially as they apply to long-form generation tasks such as creative writing.

PUBLICATIONS

DOC: Generating Longer Stories with Recursive Reprompting and Revision
Kevin Yang, Dan Klein, Nanyun Peng, Yuandong Tian
ACL 2023
We improve coherence in several-thousand-word-long stories by constructing a more detailed outline and improving the generator's ability to stay faithful to that outline. Humans prefer DOC to our previous Re^3 system by a wide margin in both automatic and interactive generation.

Re^3: Generating Longer Stories with Recursive Reprompting and Revision
Kevin Yang, Yuandong Tian, Nanyun Peng, Dan Klein
EMNLP 2022
We generate plot-coherent 2000+ word stories using a structured system which repeatedly re-prompts a language model based on the plan and previous story, followed by revising for coherence, premise relevance, and factual consistency.

Automated Crossword Solving
Eric Wallace, Nicholas Tomlin*, Albert Xu*, Kevin Yang* et al.*
ACL 2022
We create a system for automatically solving crossword puzzles, and achieve superhuman performance for the first time.

Addressing Resource and Privacy Constraints in Semantic Parsing Through Data Augmentation
Kevin Yang, Olivia Deng, Charles Chen, Richard Shin et al.
Findings of ACL 2022
We propose a data augmentation scheme for low-resource semantic parsing in complex realistic environments, which simultaneously maintains user privacy.

Multi-Objective Optimization by Learning Space Partitions
Yiyang Zhao, Linnan Wang, Kevin Yang, Tianjun Zhang et al.
ICLR 2022
We propose a space-partitioning search algorithm for finding the Pareto frontier in multi-objective optimization problems.

Learning Space Partitions for Path Planning
Kevin Yang, Tianjun Zhang*, Chris Cummins, Brandon Cui et al.*
NeurIPS 2021
We propose a path planning method inspired by a theoretical analysis of search space partitioning, and show strong performance on difficult multimodal, long-horizon path planning problems.

FUDGE: Controlled Text Generation with Future Discriminators
Kevin Yang, Dan Klein
NAACL 2021
We propose a simple, flexible, and highly effective method for controlling generation toward desired attributes using lightweight classifiers.

A Streaming Approach for Efficient Batched Beam Search
Kevin Yang, Violet Yao, John DeNero, Dan Klein
EMNLP 2020
We propose an efficient batching strategy for variable-length decoding on GPU architectures, demonstrating substantial speedups over existing fixed-width and variable-width beam searches.

Improving Molecular Design by Stochastic Iterative Target Augmentation
Kevin Yang, Wengong Jin, Kyle Swanson, Regina Barzilay, Tommi Jaakkola
ICML 2020
We use a simple and theoretically motivated self-training approach guided by an external property predictor to substantially improve over state-of-the-art approaches in molecular design.

Uncertainty Quantification Using Neural Networks for Molecular Property Prediction
Lior Hirschfeld, Kyle Swanson, Kevin Yang, Regina Barzilay, Tommi Jaakkola
JCIM 2020
We comprehensively evaluate and compare several approaches for uncertainty estimation in neural models on molecular property prediction tasks.

A Deep Learning Approach to Antibiotic Discovery
Jonathan Stokes, Kevin Yang, Kyle Swanson, Wengong Jin et al.
Cell 2020
We use computational property prediction models to screen drug databases for potential antibiotic activity, and discover previously unknown antibiotics with novel mechanisms of action which are effective even against bacteria which are resistant to commonly used antibiotics.

Analyzing Learned Molecular Representations for Property Prediction
Kevin Yang, Kyle Swanson, Wengong Jin, Connor Coley et al.
JCIM 2019
We introduce a new variant of message-passing neural networks, demonstrating consistently strong performance that significantly improves over existing baselines on many datasets. We also carefully benchmark models on both public and proprietary industry datasets.

Learning Multimodal Graph-to-Graph Translation for Molecular Optimization
Wengong Jin, Kevin Yang, Regina Barzilay, Tommi Jaakkola
ICLR 2019

We introduce an encoder-decoder architecture for molecular optimization that operates directly on the molecular graph, substantially outperforming string-based baselines as well as pre-existing state of the art.

PROFESSIONAL ACTIVITIES

Visiting Researcher, Meta AI *2022-2023*
Part-time work on methods for advancing AI story generation: topics include long-range factual consistency, improving planning and outlining, and RLHF training methods.

Research Intern, Microsoft Research (Semantic Machines) *2021*
12-week summer internship working on multiturn semantic parsing with a particular focus on data privacy.

Teaching Assistant, MIT *2018*
Course: Introduction to Inference

Research Intern, ASAPP *2018*
12-week summer internship researching and productionizing natural language processing models on difficult real-world text datasets.

Equities Research Intern, DE Shaw *2017*
11-week summer internship in equities research group. I developed a model predicting existence of hidden liquidity in equities exchanges, with strong results on real-world data.

Software Engineering Intern, Google *2016*
12-week summer internship focusing on improving search ad efficiency and optimization.

AWARDS AND HONORS

NSF Graduate Fellowship *2019*
Putnam Top 200 *2016-2018*
International Linguistics Olympiad Gold Medal (5th place) *2015*
USA Math Olympiad Honorable Mention (14th place) *2013-2015*

LANGUAGES

Proficient in Python and Java; experienced in C, R, HTML, Javascript. Also proficient in PyTorch. Natively fluent in Mandarin Chinese, advanced Japanese (JLPT N3), advanced Spanish.

REFERENCES

Dan Klein, Professor
Computer Science Division, UC Berkeley
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Regina Barzilay, Professor
CSAIL, MIT
617-258-5706 regina@csail.mit.edu