

**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

## **AWARDS AND HONORS**

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

## **RESEARCH INTERESTS**

I am broadly interested in controllable generation, and also in designing more modular and/or language-controllable agents. I have worked primarily in the NLP and biochemistry domains, and am also interested in game-playing agents.

## **PUBLICATIONS**

### **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**

**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.

## **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](mailto:regina@csail.mit.edu)