

KYLE SWANSON

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EDUCATION

University of Cambridge (Trinity College), Cambridge, United Kingdom
MASt in Mathematical Statistics (Part III of the Mathematical Tripos)

Expected June 2020

Massachusetts Institute of Technology, Cambridge, MA

M.Eng. in Computer Science and Engineering, advised by Regina Barzilay

June 2019

B.S. in Computer Science and Engineering (Course 6-3) and Mathematics (Course 18)

June 2018

GPA: 5.0/5.0

Courses: Introduction to Machine Learning, Advances in Computer Vision, Advanced Natural Language Processing, Inference and Information, Design and Analysis of Algorithms, Software Construction, Linear Algebra, Real Analysis

RESEARCH/WORK EXPERIENCE

Scholarships: Marshall Scholarship, MIT EECS Angle Undergraduate Research and Innovation Scholar

Honor Societies: Phi Beta Kappa (PBK), Tau Beta Pi (TBP), Eta Kappa Nu (HKN)

Programming Skills: Python, PyTorch, scikit-learn, HTML, CSS, JavaScript

ASAPP, Inc. – Machine Learning Research Intern, New York, NY

Summer 2019

Investigated using optimal transport to increase the interpretability of neural models for natural language processing [3]

MIT CSAIL – Graduate Researcher in Machine Learning, Cambridge, MA

September 2018–June 2019

Worked with Regina Barzilay in MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) along with Amgen, BASF, and Novartis to develop message passing neural networks to improve molecular property prediction [4] collaborated with the Broad Institute of MIT and Harvard to apply these methods to antibiotic discovery [1]

ASAPP, Inc. – Machine Learning Research Intern, New York, NY

Summer 2018

Researched and built a retrieval-based chatbot with a 56% improvement in performance over ASAPP's previous model [5]

MIT CSAIL and MGH – Undergraduate Researcher in Machine Learning, Cambridge/Boston, MA

September 2016–June 2018

Collaborated with Regina Barzilay at MIT CSAIL and Constance Lehman at Massachusetts General Hospital (MGH) to use convolutional neural networks to improve breast cancer risk prediction in mammography [6]

Suleyman Demirel University – Machine Learning Teacher, Almaty, Kazakhstan

January 2018

Developed and taught a one-month machine learning course to 20 university students: <https://github.com/swansonk14/IntroML>

Driver, Inc. – Data Science Intern, San Francisco, CA

Summer 2017

Developed an algorithm to accurately detect near-duplicate content in cancer patients' medical records

Microsoft Corporation – Front-end Software Engineering Intern, Bellevue, WA

Summer 2016

Improved the performance and aesthetic of an internal web tool used to view application events in near real-time

PUBLICATIONS

[1] J. Stokes, K. Yang, **K. Swanson**, W. Jin, A. Cubillos-Ruiz, N. Donghia, C. MacNair, S. French, L. Carfrae, Z. Bloom-Ackerman, V. Tran, A. Chiappino-Pepe, A. Badran, I. Andrews, E. Chory, G. Church, E. Brown, T. Jaakkola, R. Barzilay, J. Collins. A Deep Learning Approach to Antibiotic Discovery. *Cell*, 2020.

[2] K. Swanson, S. Trivedi, J. Lequieu, **K. Swanson**, R. Kondor. Deep learning for automated classification and characterization of amorphous materials. *Soft Matter*, 2019.

[3] **K. Swanson**, L. Yu, T. Lei. Interpretable Text Matching by Learning a Constrained Alignment. *Workshop on Optimal Transport & Machine Learning at the Thirty-third Conference on Neural Information Processing Systems*, 2019.

[4] K. Yang, **K. Swanson**, W. Jin, C. Coley, P. Eiden, H. Gao, A. Guzman-Perez, T. Hopper, B. Kelley, M. Mathea, A. Palmer, V. Settels, T. Jaakkola, K. Jensen, R. Barzilay. Analyzing Learned Molecular Representations for Property Prediction. *Journal of Chemical Information and Modeling*, 2019.

[5] **K. Swanson**, L. Yu, C. Fox, J. Wohlwend, T. Lei. Building a Production Model for Retrieval-Based Chatbots. *Workshop on NLP for Conversational AI at the 57th Annual Meeting of the Association for Computational Linguistics*, 2019.

[6] C. Lehman, A. Yala, T. Schuster, B. Dontchos, M. Bahl, **K. Swanson**, and R. Barzilay. Mammographic Breast Density Assessment Using Deep Learning: Clinical Implementation. *Radiology*, 2018.