

Ryan Young | Ph.D.

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☎ On Request
Waltham, MA

SUMMARY

Engineer Scientist with experience intersecting computing, biology, and machine learning. Skilled in developing end-to-end solutions, from raw data processing to ML models. Proficient in Python (advanced), ML/statistics, SQL, and cloud computing. Seeking to leverage my broad expertise in the domain of biology, healthcare, or tech to deploy impactful data/ML-powered solutions in tech, biotech, or healthcare.

SKILLS

Machine Learning & AI: Machine Learning · Probabilistic Programming · Bayesian Models · Deep Learning · LLMs · Multi-Agent Systems · Time-Series Analysis · Statistical Modeling · Markov-decision Process

Data Analysis & Processing: Data Analysis & Visualization · Data Pipelines · Data Cleaning & Preprocessing · Feature Engineering · Model Evaluation

Programming & Software: Python (Advanced), C/C++, Julia, SQL, Shell · Git, DVC, CI/CD · Cloud Computing (AWS, Google Cloud, Docker, Azure - Familiar) · Unix/Linux Environments · TensorFlow, PyTorch, Jax, Scikit-learn

Collaboration & Communication: Teamwork · Cross-Functional Collaboration · Technical Communication · Presentation Skills · Data Storytelling · Scientific Writing

RELEVANT EXPERIENCE

Machine Learning Engineer (Part-time) - Stealth Startup (April 2024 - Present)

- Architected and implemented a multi-agent network of LLMs using DSPy to optimize a novel healthcare solution.
- Engineered data pipelines to generate a fine-tuning dataset, increasing response quality 5% with a 30x smaller model size.
- Deployed an AI application via Streamlit, integrating real-time speech transcription using the Whisper API.

Postdoctoral Scientist - Brandeis University, Waltham, MA (Jan 2024 - Sep 2024)

- Developed Python- and Julia-based machine learning tools to extract a manifold representing the coordinated activity of two brain areas (w/ CCA and TCA).

Predoctoral Scientist - Brandeis University, Waltham, MA (Aug 2016 - Dec 2023)

- Decoded animal behavior from terabyte-scale neural time-series data using ML algorithms in Python and Julia – for two separate first-author results.
- Engineered data pipelines for large-scale biological datasets, reducing data footprint by 50%, accelerating data access by 30% – removing deeply nested cell arrays in favor of Apache Arrow tidy data.
- Presented research at scientific conferences and public forums (audiences up to 250/year, ranking in the top third for audience engagement (based on anonymous reviews)).

Convolutional Neural Network (CNN) Decoding Project (2019 - 2020)

- Developed and optimized a CNN model in TensorFlow to decode animal kinematics and goals from neural time-series image data, achieving over 90% accuracy predicting animal behavior from brain cells.
- Employed explainable AI techniques to determine the contribution of specific brain areas and frequencies to the accurate decoding of multiple animal behaviors.
- (Ongoing, 2024) Exploring a paired autoencoder architecture to reconstruct neural activity between brain regions, aiming to reveal underlying communication patterns.

ADDITIONAL PROJECTS & EXPERIENCE

- **Closed-Loop Brain Disruption System (2015 - 2016):** Developed and implemented a feature for a C++ real-time brain stimulation system, achieving a 3ms latency reduction through signal processing optimization. The system contributed to a \$400,000 NIH grant.
- **Decoding human reaction times via Muse EEG Headset (2016):** Designed a data processing pipeline in Python and MATLAB to analyze human EEG data, successfully decoding reaction times using linear modeling. Utilized JavaScript to create a web-based platform to sample human reaction time data.
- **Active open-source project collaborator (Ongoing):** Contributed to RatInABox, SpikeGadgets, and Julia packages (DTW.jl, Plots.jl), demonstrating experience with collaborative software development.
- **Odor Perception Prediction Library (“Gin”, May 2024 - Present):** Developed a Python library using a message-passing Graph Convolutional Network (GCN) to predict odor perception. Utilized cheminformatics RDKit tools to process and visualize SMILE strings.

AWARDS & RECOGNITION

- **1st Place - MIT GrandHack Hacking HealthCare (GenAI, Tech Solution) (2024):** Led a team to develop a generative AI solution for addressing memory and loneliness issues in the elderly.
- NIH Computational Neuroscience Training Grant Recipient
- 1st Place - UTSA Brain Bowl Neuroscience Competition
- Harvard Data Science Competition, Top 15 solution

PUBLICATIONS

- Sheth BR, Young, RA. “Two Visual Pathways in Primates Based on Sampling of Space: Exploitation and Exploration of Visual Information.” *Front Integr Neurosci* 10, 37 (2016).
- Young, RA, Shin, JD, Guo, Z, & Jadhav, SP. “Hippocampal-prefrontal communication subspaces align with behavioral and network patterns in a spatial memory task.”
- (In-preparation) Young, RA, Jadhav SP. “Differential Impact of Cue- and Memory-Dependent Tasks on CA1-PFC Temporal Coding.”
- Ding, M, Tomsick P, Young RA, & Jadhav, SP. “VTA dopamine neural activity switches simultaneously with rule representations in the prefrontal cortex and hippocampus.”

EDUCATION

Brandeis University, Waltham, USA

Ph.D. in Computational Neuroscience (GPA: 3.95)

Fall 2016 - Fall 2023

Thesis: “*Retro-prospective Representations and Communication Subspaces of the Cognitive Map*”

Awards: Computational Neuroscience Training Grant M.Sc. in Neuroscience

Aug. 2014 - May 2015

Baylor University, Waco, TX

B.S. in Neuroscience, Minor in Computer Science/Engineering

Aug. 2006 - May 2010

Awards: Dean’s List, 1st Place in UTSA Brain Bowl

CERTIFICATIONS

Machine Learning in Production

DeepLearning.AI (MOOC)