Jordan Safer

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PERSONAL PROFILE

Protein Bioinformaticist passionate about leveraging computational techniques to study disease mechanisms and advance therapeutic discovery. Experienced in integrating bioinformatics approaches with experimental biology to drive collaborative research and innovation.

EDUCATION

Technion - Israel Institute of Technology, Haifa, IL - *Doctorate in Computer Science*

DECEMBER 2025 - PRESENT

- Bioinformatics and Systems Biology under Professor Roy Kishony

Massachusetts Institute of Technology, Cambridge, MA - *Advanced Study Program*

SEPTEMBER 2023 - MAY 2024

- Coursework: Graduate Biochemistry, Protein Engineering

Carnegie Mellon University, Pittsburgh, PA - *Master of Science in Electrical and Computer Engineering*

SEPTEMBER 2017 - MAY 2018

- Teaching Assistant for Digital Signal Processing
- Coursework: Neural Signal Processing, Algorithm Design, Algebraic Structures (Group Theory), Information Theory, Neuroscience for Engineers, Continuous Time Finance (Stochastic Calculus)

Carnegie Mellon University, Pittsburgh, PA - *Bachelor of Science in Electrical and Computer Engineering*

SEPTEMBER 2014 - MAY 2017

- Worked 3 semesters as a Teaching Assistant for Functional Programming
- Selected Coursework
    - Computer Engineering: Embedded Systems, Computer Architecture
    - Computer Science: Compiler Design, Computer Systems, Functional Programming

EXPERIENCE

Broad Institute of MIT and Harvard, Cambridge, MA
Center for the Development of Therapeutics (CDoT), 2023 - 2024
Iqbal Lab, Ladders 2 Cures (L2C) Accelerator, 2024 - 2025
Computational Associate
PI: Sumaiya Iqbal, PhD

APRIL 2023 - SEPTEMBER 2024

- Led development for Genomics 2 Proteins portal project - to make bringing genomic information to the protein space accessible to all. Added structural features, MAVEdb data, and integrations to view variants in the context of sequence and structure
- Led a research project analyzing the outputs of *in silico* mutagenesis scanning data for AlphaFold structures

- Co-led a research project for predicting the impact of missense variants on voltage gated ion channels
- Developed a pipeline to identify hits and analyze readouts for a Liquid Chromatography - Mass Spectrometry (LCMS) drug discovery project

Data Sciences Platform (DSP), Analysis Journeys Team
Senior Software Engineer, July 2022 - April 2023
Software Engineer, October 2021 - June 2022

OCTOBER 2021 - MARCH 2023

- Maintained data management system for Terra.bio high throughput sequencing platform
- Developed automated infrastructure deployment for Microsoft Azure as an embedded engineer within a Microsoft team for initiative to make Terra available to hospital systems through Microsoft Azure
- Integrated Azure infrastructure to deliver Python Notebook support as an embedded engineer on the DSP applications team
- Coordinated with the Terra Data Repository (TDR) team to support datasets from TDR in Terra

Amazon Robotics, North Reading, MA
Robotic Inventory Team
L5 Software Engineer, April 2021 - September 2021
L4 Software Engineer, July 2018 - April 2021

JULY 2018 - SEPTEMBER 2021

- Worked alongside the station and planning teams to deliver a robotic solution to last mile delivery
    - Led the move from internal legacy systems to AWS serverless technology for our team
- Subject matter expert and lead for shelf stability and station hardware
- Talent development
    - Gave tech talks at Carnegie Mellon Fall and Spring career fairs on our technology
    - Interviewed over 25 applicants intern and full-time positions, worked with a team to automate reducing systematic bias in the interview process by detecting use of pronouns, candidates names, and other identifying and biased language
    - 1-on-1 mentored an undergraduate intern, whose outstanding projected was selected out of 50 as the model for a successful internship for training future mentors

University of Pittsburgh - Department of Neurobiology, Pittsburgh, PA
Research Assistant
PI: Bryan M. Hooks, PhD

FEBRUARY 2018 - JUNE 2018

- Analyzed spectroscopy data from mouse brains to understand the connectivity between regions
- Exploration: tried using Hough transforms and Sobel filters to emphasize activated neuron axons
- Achievements: Used PCA to differentiate regions based on connectivity, improved downsampling for high-resolution data

PUBLICATIONS & PREPRINTS

Kwon, S.*, **Safer, J.F.***, Nguyen, D.T., Hoksza, D., May, P., Arbesfeld, J.A., Rubin, A.F., Campbell, A.J., Burgin, A., Iqbal, S. *Genomics 2 Proteins Portal: A Resource and Discovery Tool for Linking Genetic Screening Outputs to Protein Sequences and Structures*. ***Nat Methods***, 18 Sep 2024. https://doi.org/10.1038/s41592-024-02409-0.

*Denotes Co-First Author

Arbesfeld JA, Da EY, Stevenson JS, Kuzma K, Paul A, Farris T, Capodanno BJ, Grindstaff SB, Riehle K, Saraiva-Agostinho N, **Safer JF,** Milosavljevic A, Foreman J, Firth HV, Hunt SE, Iqbal S, Cline MS, Rubin AF, Wagner AH. Mapping MAVE data for use in human genomics applications. Genome Biology, 25 June 2025. doi: 10.1186/s13059-025-03647-x.

[preprint] Rissom, P.F., Sarmiento, P.Y., **Safer, J.F.,** Coley, C.W., Renard, B.Y., Heyne, H.O., Iqbal, S. *Ema-Tool: A Python Library for the Comparative Analysis of Embeddings from Biomedical Foundation Models*. bioRxiv, 27 June 2024, p. 2024.06.21.600139. *bioRxiv*, https://doi.org/10.1101/2024.06.21.600139.

POSTERS & PRESENTATIONS

Invited Talk

Genomics to Proteins Portal: A Discovery Portal to Link Genetic Screening Outputs to Protein Sequence and Structure, **Mutational Scanning Symposium**, Cambridge, MA. May 23, 2024

Workshops

Protein Structure Bioinformatics with Genomics 2 Proteins Portal, **BroadHacks Hackathon**, Cambridge, MA. June 18, 2025.

Genomics 2 Proteins portal: Scalable bioinformatics resources and tools to connect genetic screening outputs to protein sequence and structures, **Great Lakes Bioinformatics Conference,** Minneapolis, MN. May 12, 2025

Introduction to Genomics 2 Proteins platform: A scalable, discovery portal to connect genetic screening outputs to protein sequence and structures, **BroadE Workshop,** Cambridge, MA. March 12, 2025

Predicting Loss- and Gain-of-Function in Ion Channel Variants Using Machine Learning, **MIT-HPI Spring Workshop**, Cambridge, MA. March, 2024

Posters

Predicting Loss- and Gain-of-Function in Ion Channel Variants Using Machine Learning. **Safer, J.**, Rissom, P., Yanez Sarmiento, P., Brunklaus, A., Balaz, D., Castelli, R., Coley, C. W., Depienne, C., George, A. L., Kurganov, E., Marini, C., Steensbjerre Møller, R., Moroni, A., Pan, J., Santoro, B., Renard, B. Y., Heyne, H., Iqbal, S. **American Society of Human Genetics Annual Meeting**, Denver, CO. November 5-9, 2024

Characterizing 127 understudied kinases through in silico saturation mutagenesis of predicted protein structures. **Safer, J.**, Kwon, S., Arnaudi, M., Tiberti, M., Papaleo, E., Iqbal, S. **Biophysical Society Annual Meeting**, Philadelphia, PA. February 10-14, 2024

Genomics To Proteins portal: A discovery tool to link genetic screening outputs to protein sequence and structure. Iqbal, S., **Safer, J.**, Nguyen, D., Kwon, S., May, P., Hoksza, D., Campbell, A., Burgin, A. **American Society of Human Genetics Annual Meeting,** Washington, DC. November 1-5, 2023

LEADERSHIP

Symposium Organizer, Machine Learning in Drug Discovery Symposium, 2023 & 2024
Broad Institute of MIT

- Led event website development, organized speaker dinner, and served as poster judge

CodeRATS Chair, 2024 - Present

Broad Institute of MIT and Harvard

- Lead CodeRATS steering committee to organize events for Computational Associates at the Broad Institute of MIT and Harvard including monthly lunches, office hours, and a hackathon

BroadHacks Co-Chair, 2024, 2025
Broad Institute of MIT and Harvard

- Launched inaugural 24-hour hackathon; organized teams, offered workshops, led project planning, and developed participant resources.
- Oversaw second annual hackathon, securing our first sponsors, industry partners, and our first keynote speaker

Counter Bias Group Member, 2020 - 2021
Amazon Inc.

- Wrote programs to scan interview feedback for gendered and identifying language to remove it and combat bias and discrimination in the Amazon interview process

Jewish Student Association Vice President, 2017
Carnegie Mellon University

ABFilms Finance Chair, 2017
Carnegie Mellon University

Tartans4Israel President, 2016
Carnegie Mellon University

- Organize Israeli cultural and Hebrew language events at Carnegie Mellon

TECHNICAL SKILLS AND PROFICIENCIES

- **Protein Bioinformatics and Structural Analysis**: FoldX, fpocket, DSSP, PhosphoSitePlus, UniProt, PyMOL, AlphaFold2/3, DepMap, ThermoMPNN, ClinVar, gnomAD, MaveDB
- **Programming Languages:** Python, Javascript, Java, bash, C, Matlab, OCaml, SystemVerilog
- **Cloud Computing and DevOps Skills:** Unix & Linux shells, using version control (git), building cloud applications on AWS, GCP, and Azure with serverless & hosted technology stacks
- **Framework-Based Web Development:** React, Angular, Handlebars, and JSP
- **Hardware Operation and Embedded Systems:** microcontrollers, FPGAs, desktop components

STANDARDIZED TESTS

- GRE General (2024) - 170 Q (perfect score) / 168 V (98th percentile)

AWARDS

- National Science Foundation Graduate Research Fellowship Awardee - Awarded to approximately 12% of applicants, this award provides $159,000 in funding for 3 years of study in the US
- Center for Development of Therapeutics Spot Award (2x awarded) - Monthly department award to 1-3 high impact contributors out of 50 people in the department
- Mideast All-Region Honors Cross Country - Awarded to top 25 fastest runners out of ~1000 varsity athletes competing in the Mideast Region
- University Athletic Association All Academic (4x) - Awarded to Varsity athletes with GPA > 3.30 (B+)

MENTORSHIP

- Summer 2025: Mentor undergraduate intern working to expand the yEvo educational platform to teach high school students about the impact of mutation of protein function
- 2024 - 2025: Mentor for a UCLA undergraduate student on work to create computational tools to analyze the impact of post-translational modifications in Parkinson's disease
- 2024 - 2025: Mentor 3 Boston University students on computational projects developing tools for protein structure analysis
- Summer 2022: Mentor 1 software engineering intern to develop a monitoring system for our high throughput sequencing platform
- 2020-2021: Mentor 3 entry level software engineers at Amazon on developing serverless and server based cloud applications
- 2019: Mentor an intern at Amazon to develop a computational tool for emergency warehouse shutdowns for natural disasters and recovery. Recognized as top project of 50 interns

COMMUNITY OUTREACH

- 2024 - 2025: Reading mentor at Kennedy-Longfellow Elementary School
- 2023-24: Volunteer data curator for the OpenTECR reaction equilibrium database
- 2021-22: Volunteer tutor for Somerville Public Schools for Math and Computer Science for high school, middle school, and elementary school students

PROJECTS (https://github.com/jordansafer)

- 2024: Wordle adapted for a chess board, user has to guess the "mystery move"
    - GitHub: https://github.com/jordansafer/bulletle
    - Demo: https://bulletle.vercel.app/
- 2023: Webapp game integrated with GPT4 API where user directs LLM and LLM moves sprite
    - GitHub: https://github.com/jordansafer/chatgpt-team-game
    - Demo: https://jordansafer.github.io/chatgpt-team-game/
- 2021: Chrome extension using OpenCV to read text from a screen-selection
- 2020: Covid19 website to view case graphs on NYT covid data in March 2020, built a desktop computer and baked a GPU, mechanical turk experiment to transcribe old census data
- 2019: AI to play Screeps computer-game. Manages resources, defense, construction, etc
    - GitHub: https://github.com/JonathanSafer/screeps

PRE 2019/University

- Designed and implemented a compiler with a partner for the c0 language. Implemented in 5 stages. Lost sleep dealing with x[i] = ++x[i] + x[i]++ type memory handling
- Capstone project: Detect elderly falls from android camera with background subtraction and object tracking
- Superscalar pipeline implementing RISC-V in SystemVerilog
- Lukas-Kanade algorithm implementation in Matlab for object tracking
- Smart football with embedded IMU tracks and reports throw statistics and predicts the passer:
    - GitHub: https://github.com/jordansafer/determinator
- PacRunner python game supports python on an infinite grid
    - GitHub: https://github.com/jordansafer/pacrunnergame
    - Demo: https://www.youtube.com/watch?v=Q86Zm2wwvOM

Additional Skills & Interests

- **Languages:** Fluent Hebrew, Intermediate Mandarin Chinese, Elementary French
- **Long distance running:** Transitioned from 8 kilometer races in college to the marathon and ultramarathon distances. Completed first 50-mile race in 2022, 10th marathon in 2023, and first triathlon in 2024