George Kassis

EDUCATION

University of Rochester School of Medicine and Dentistry   **Rochester, NY**
MD/PhD Candidate   *Aug 2023 – Present*

University of Rochester   **Rochester, NY**
Bachelor of Science in Neuroscience   *Aug 2018 – May 2022*
Minor in Electrical & Computer Engineering

HONORS AND AWARDS

- Summa Cum Laude Honor, 2022: Latin honor that is awarded to graduates with a final cumulative grade point average that comprises the top 2% of the class.
- Best Poster Award, 2021: Recognizes excellence in research, poster design, and presentation.
- ICARE STAR, 2021: A recognition for significant volunteering contributions at the University of Rochester Medical Center.
- Phi Beta Kappa, 2021: An honorary membership that recognizes and honors exceptional academic achievement in the arts and sciences.
- The Discover Grant for Undergraduate Summer Research, 2019: Supports immersive, full-time summer research experiences for select students at the University of Rochester.
- Dean's List all eligible semesters, 2018 - 2022: Students are placed on the dean's list for a certain semester if they have an overall semester grade point average above 3.4 and have completed 16 or more credit hours.
- Dean's Scholarship, 2018: Awarded to students who have demonstrated both academic achievement and the potential to make unique contributions to Rochester student life.

EMPLOYMENT HISTORY

The Pivot Group   **Remote | Washington, DC**
Political Data Coordinator   *June 2022 – Nov 2022*
- Implemented a Python algorithm and a Graphical User Interface to track and coordinate the flow of 500+ jobs between the data team and other teams at the company.
- Ran several statistical analyses in order to provide clients with visualizations of the demographics and voting history at the state, county, and district levels.
- Worked with Excel and IBM SPSS to store, preprocess, and statistically analyze lists of potential voters, with the aim of maximizing the voting turnout for client candidates.
- Queried USPS databases weekly to track over 10 million mail letters through printing facilities and monitor their reception by households.

- Assessed the prediction accuracy of several machine learning models, such as boosted decision trees and random forests, with regards to voters' propensity and partisanship scores.
- Met weekly with colleagues and clients to discuss steps that would further support the candidates' legislative plans.

Thakar Lab at the University of Rochester Medical Center   Rochester, NY
Research Assistant and Data Analyst   *May 2021 – Aug 2022*
- Queried online scientific databases for the topologies of twenty cellular networks and obtained gene annotations from the Ensembl genome database project by using their Perl API.
- Used R and Python to filter, normalize, and integrate single-cell RNA expression datasets.
- Investigated gene expression patterns using dimensionality reduction techniques such as PCA as well as clustering and visualization algorithms such as K-means, t-SNE, and UMAP.
- Used a genetic algorithm to computationally model and simulate the activation of immune cells in HIV, breast cancer, lung cancer, and COVID-19 patients.
- Used statistical tests such as the Chi-squared test, t-test, and ANOVA to quantify the significance of findings.
- Presented new findings at the University of Rochester Medical Center.

Biomedical Engineering Department at the University of Rochester   Rochester, NY
Teaching Assistant   *Jan 2021 – May 2021*
- Debugged and graded students' coding scripts and Arduino Uno projects.
- Held weekly office hours to answer students' questions and lead C/C++ coding tutorials.

Neuroscience Department at the University of Rochester   Rochester, NY
Teaching Assistant   *Aug 2020 – Dec 2020*
- Led one neuroscience recitation to facilitate students' discussion and guide them in solving questions.
- Assisted the professor in preparing sheep brains and guiding students' use of statistical software for a neurobiology lab.
- Held several review sessions prior to exams and replied to students' emails about assignments.

University of Rochester Center for Advanced Brain Imaging and Neurophysiology   Rochester, NY
Research Assistant   *Feb 2020 – May 2022*

- Prepared for research sessions by setting up, calibrating, and synchronizing EEG equipment, OptiTrack motion capture systems, and a Pupil Labs eye tracker.
- Administered Montreal Cognitive Assessment test to older adults in order to determine eligibility to participate in research.
- Prepped participants for experiments by applying conductive gel, placing EEG electrodes, and arranging motion capture markers.
- Monitored EEG signals, fixed technical issues, and ensured participants' comfort throughout the experiment.
- Trained and tested several classifiers including random forests, support vector machines, and recurrent neural networks to optimize the detection of different types of eye movements recorded by an eye tracker.
- Utilized dimensional reduction algorithms such as PCA and ICA to filter out artifacts in EEG data that are due to eye movements and muscle contractions.
- Performed data collection, data archiving, and data analysis using MATLAB, Python, and C++, with the purpose of identifying biological markers for Parkinson's disease and attention-deficit/hyperactivity disorder.
- Participated in the laboratory's journal club, where the research team met weekly to critically evaluate recent scientific articles.

Biology Department at the University of Rochester   **Rochester, NY**
Head Teaching Assistant   *Aug 2019 – May 2020*
• Led three workshops for two classes at the Biology Department to answer students' questions and provide
  them with studying resources.
• Arranged the review sessions and proctoring dates for the other teacher assistants at the Biology Department.
• Provided the other teacher assistants with advice and strategies to approach the various studying habits of
  students and lead effective workshops.

ORAL AND POSTER PRESENTATIONS

• George Kassis, Mukta G. Palshikar, & Juilee Thakar. Characterization of B Cell states with respect to BCR
  and HIF-1 Pathways using discrete-state modeling. 5 Aug. 2021. Summer Undergraduate Research
  Fellowship Exposition at the University of Rochester Medical Center. Rochester, NY. (Poster)

PUBLICATIONS

• Kassis, G., Palshikar, M. G., Hilchey, S. P., Zand, M. S., & Thakar, J. (2024a). Discrete-state models identify
  pathway specific B cell states across diseases and infections at single-cell resolution. *Journal of Theoretical
  Biology*, *583*, 111769. https://doi.org/10.1016/j.jtbi.2024.111769

• Patelaki, E., Foxe, J. J., Mantel, E. P., Kassis, G., & Freedman, E. G. (2023). Paradoxical improvement of
  cognitive control in older adults under dual-task walking conditions is associated with more flexible
  reallocation of neural resources: A mobile brain-body imaging (MOBI) study. NeuroImage, 273, 120098.
  https://doi.org/10.1016/j.neuroimage.2023.120098

VOLUNTEER ACTIVITES

Saunders Research Building Vaccination Clinics   **Rochester, NY**
Patient Care Volunteer   *Jan 2021 – June 2021*
• Assisted in the process of checking patients in and out of the clinics.
• Assembled patients' forms and vaccination cards.
• Greeted patients and provided them with information regarding the appointment process.
• Provided wheelchair assistance when needed and directed patients through the wait-lines and the
  postvaccination monitoring area.

Friends of Strong Memorial Hospital   **Rochester, NY**
Clinical Volunteer   *Aug 2019 – Dec 2019*
• Volunteered in the pediatric emergency department to assist nurses in responding to patients' questions.
• Monitored any changes in patients' vital signals and notified doctors when necessary.
• Transported persons via wheelchair or rolling bed.
• Provided support and assisted visitors with basic needs.

Stem Initiatives Club at the University of Rochester   **Rochester, NY**
Community Volunteer   *Sep 2018 – Mar 2020*
- Prepared Science Experiments for middle and high school students in order to foster their passion to learn science and support their pursuits of careers in STEM.
- Led and supervised high school students while preparing for their participation in national technology and science competitions.
- Guided students in building robots and reviewing competition questions from earlier years.

SKILLS

- Data Analysis: Python, C/C++, SQL, IBM SPSS, R, MATLAB.
- Data Visualization: Excel, Matplotlib, Seaborn, Tableau.
- Machine Learning: scikit-learn, Keras, Tensorflow.
- Imaging equipment: EEG, MRI
- Imaging software: Freesurfer, MNE, EEGLAB
- Signal processing: Digital Filters, Fourier Transforms, Laplace Transforms, Convolutions.
- Languages: English, Arabic, French.