

EDUCATION

- **The Johns Hopkins University** Baltimore, MD
B.S. in Applied Math & Statistics + B.A. in Mathematics; Senior; 4.00 GPA Aug. 2022 – June 2026
- **Scarsdale High School** Scarsdale, NY
High School Diploma; 4.00 (4.15/4.30) GPA Aug. 2018 – July. 2022

SKILL SET AND INTERESTS

- **Programming:** Python, Java, Bash, C++, Javascript
- **Research:** Population Models, Stochastic Processes, Analysis, Probability

EXPERIENCE

- **Teaching Assistant/Tutoring** Baltimore, MD
The Johns Hopkins University Sept 2024 - Present
 - **Machine Learning Teacher Assistant (Spring, 2025):** Graded assignments for 100 students
 - **Probability Teacher Assistant (Fall, 2024):** Lead discussion sections, grade assignments, and proctor exams.
 - **Intro to Computing Teacher Assistant (Fall, 2024; Spring, 2024):** Hold office hours for students, grade assignments, and assist in class.
 - **Physics II Learning Assistant (Spring, 2024):** Assist students during discussion section on problem sets.
 - **Learning Den Personalized Tutor (Fall, 2023):** Tutor students on subjects ranging from Organic Chemistry to Honors Linear Algebra.
- **Foo Lab** Minneapolis, MN
Student Researcher Jan 2025 - Present
 - **Investigating effect of senescent cells on tumor and cancer-treatment dynamics:** Leading a project investigating theoretical therapeutic strategies containing both anti-cancer and senolytic treatments to effectively reduce the tumor burden.
 - **Examining the site-frequency-spectrum in a population with selection:** Working with both Profs. Jasmine Foo and Kevin Leder to examine the site frequency spectrum in a population having driver and neutral mutations.
- **Noble Lab** London, England
Student Researcher Feb 2024 - Present
 - **Investigating properties of a universal tree balance index:** Performing analytical work to investigate expected values of the J_1 index, along with minimal values in a special class of trees.
 - **Investigating extinction therapy:** Used simulations and analytical work to understand the theoretical merits of a two-sequence cancer therapy, where the second drug is applied whilst the tumor is still undetectable.

MANUSCRIPTS & PREPRINTS

1. **Ahmed, A.**, Leder, K., & Foo, J. (2025). The Site Frequency Spectrum in an Exponentially Growing Population with Selection. *In preparation*.
2. **Ahmed, A.**, & Foo, J. (2025). A Theoretical Investigation into Incorporating Senolytics into Anti-Cancer Therapies. *In preparation*.
3. Manojlović, V.*, **Ahmed, A.***, Viossat, Y., Noble, R. (2025). Expected and minimal values of a universal tree balance index. *arXiv*. doi:10.48550/arXiv.2507.08615. (*Currently Submitting*)
4. Patil, S., **Ahmed, A.**, Viossat, Y., & Noble, R. (2024). Preventing Evolutionary Rescue In Cancer. *biorxiv*. doi:10.1101/2023.11.22.568336. (*Accepted, Pending Publication to Genetics*)
5. **Ahmed, A.**, Whittington, J., & Shafaei, Z. (2023). Impact of Commission on Cancer Accreditation on Cancer Survival: A SEER Database Analysis. *Annals of Surgical Oncology*. doi:10.1245/s10434-023-14709-4

*These authors contributed equally to the work.

CONFERENCES AND WORKSHOPS

1. Patil, S., **Ahmed, A.**, Viossat, Y., & Noble, R. (2025). Preventing evolutionary rescue in cancer using two-strike therapy. Congress of the European Society for Evolutionary Biology, Barcelona.
2. Patil, S., **Ahmed, A.**, Viossat, Y., & Noble, R. (2025). A Theoretical Analysis of Sequential Two Drug Anti-Cancer Therapy. Society for Industrial and Applied Mathematics DC-Maryland-Virginia, Baltimore.
3. **Ahmed, A.**, Yang, R., & Zhang, Y. (2025). Exchange Dynamics of Single Molecule in Phase Separated Droplet. APS March Meeting, Anaheim.
4. **Ahmed, A.** & Zhang, Y. (2024). Computational investigation of a de novo designed protein that separates into liquid droplets before crystallization. Institute of Biophysical Research Retreat, Washington D.C.
5. Yang, R., Wang, C., **Ahmed, A.**, Grigorev, V., Moulick, R., Woodson, S., & Zhang, Y. (2024). Exchange Dynamics of Single Molecule in Phase Separated Droplet. Institute of Biophysical Research Retreat, Washington D.C.
6. Esparham, A., **Ahmed, A.**, Shoar, S., & Shafae, Z. (2024). Impact of Obesity on In-Hospital Outcomes Following Hepatic Resection: A Propensity Score Matched Analysis of the US National Inpatient Sample. Advanced Cancer Therapies, Puerto Rico.
7. **Ahmed, A.**, Whittington, J., & Shafae, Z. (2024). Patterns of presentation and delivery of care of appendiceal neoplasms in the municipal safety-net setting. Society of Surgical Oncology Annual Meeting, Atlanta.
8. Esparham, A., **Ahmed, A.**, Shoar, S., & Shafae, Z. (2024). National Trends, Complications, and In-hospital Outcomes for Patients Undergoing Immediate Implant-based versus autologous-based Breast Reconstruction: A Propensity Score Matched Analysis. Society of Surgical Oncology Annual Meeting, Atlanta.
9. **Ahmed, A.**, Whittington, J., & Shafae, Z. (2024). Patterns of presentation and delivery of care of appendiceal neoplasms in the largest municipal health care delivery system in the United States. ASCO Gastrointestinal Cancers Symposium, San Francisco. doi:10.1200/JCO.2024.42.3_suppl.14
10. Kang, J., Momčilo, G., Urteaga, R. M., **Ahmed, A.**, & Ha, T. (2023). Engineered Helicase Replaces Thermocycler in DNA Amplification. The UKC.
11. **Ahmed, A.** & Shafae, Z. (2023). Impact of Commission on Cancer Accreditation on Cancer Survival: A SEER Database Analysis. International Conference on Surgical Cancer Care, Boston. doi:10.1245/s10434-023-13332-7

RELEVANT COURSEWORK

(Unofficial transcript available [here](#))

- Honors Analysis I (110.415; A+)
- Honors Analysis II (110.416; A)
- Control Theory & Optimal Control (553.797; A)
- Graph Theory (553.672; A+)
- Stochastic Differential Equations: An Introduction With Applications (110.653; A)
- Game Theory (625.741; A+)
- Probability (553.620; A+)
- Honors Mathematical Statistics (553.431; A)

AWARDS

- **The Naddor Prize (\$300 Award)** Baltimore, MD
The Johns Hopkins University *Apr 2025*
 - **Award Description:** Provided for distinguished academic performance by an Applied Mathematics and Statistics student who is not a Senior.
- **Dean's ASPIRE Award Recipient (\$2,250 Research Award)** Baltimore, MD
The Johns Hopkins University *Jan 2024*
- **Dean's List (all semesters)** Baltimore, MD
The Johns Hopkins University *Jan 2023*
- **Regeneron STS Semifinalist** Washington D.C.
Society For Science *Jan 2022*

EXTRACURRICULAR ACTIVITIES

- **The Johns Hopkins News-Letter** Baltimore, MD
Writer *Jan 2023 - Sep 2023*
 - **Volunteer writer for the SciTech column:** I generally write articles weekly about different scientific topics. Duties include researching topics, interviewing scientists, and writing articles.