

Charbel Abi Younes

Seattle, WA | cyounes@uw.edu

EDUCATION

- **University of Washington** Seattle, WA
Ph.D. in Applied Mathematics | Advisor: Tom Trogdon Sep 2023 - Jun 2028 (Expected)
- **University of Washington** Seattle, WA
M.S. in Applied Mathematics | GPA: 3.99 Sep 2022 - June 2023
- **Lebanese American University** Beirut, Lebanon
B.S. in Mathematics, Minor in Computer Science | GPA: 4.00 Aug 2019 - May 2022

PUBLICATIONS AND PREPRINTS

1. C. Abi Younes, T. Trogdon. Banded Hermitian matrices, matrix orthogonal polynomials, and the Toda lattice. arXiv preprint 2604.09883, 2026.
2. C. Abi Younes, X. Ding, T. Trogdon. A Lanczos-based algorithmic approach for spike detection in large sample covariance matrices. arXiv preprint 2504.03066, 2025.

INVITED TALKS

5. *Asymptotics of orthogonal polynomials with applications to density estimation of random matrices.* SIAM Annual Meeting, Cleveland, OH, July 2026.
4. *Spectral density estimation for random matrices.* 27th Conference of the International Linear Algebra Society, Virginia Tech, May 2026.
3. *Density estimation for sample covariance matrices.* SIAM PNW Fifth Biennial Meeting, Seattle, WA, October 2025.
2. *A Lanczos-based approach for spike detection in large sample covariance matrices.* The Second Conference on Random Matrix Theory and Numerical Linear Algebra, Seattle, WA, June 2025.
1. *Asymptotics of orthogonal polynomials with applications in spectral density estimation.* The Thirteenth International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, GA, April 2025.

POSTERS

1. *A Lanczos-based approach for spike detection in large sample covariance matrices.* The Second Conference on Random Matrix Theory and Numerical Linear Algebra, Seattle, WA, June 2025.

CONFERENCE ORGANIZATION

1. Section co-organizer, SIAM Annual Meeting, Minisymposium on “Orthogonal Polynomials and Special Functions in Mathematical Physics”, Cleveland, OH, July 2026.

TEACHING EXPERIENCE

- **University of Washington**

- Instructor of Record, AMATH 352 (Applied Linear Algebra And Numerical Analysis), Summer 2026.
- Teaching Assistant, AMATH 501 (Vector Calculus and Complex Variables), Autumn 2025.
- Teaching Assistant, AMATH 402 (Dynamical Systems And Chaos), Winter 2025, Winter 2026.
- Teaching Assistant, AMATH 352 (Applied Linear Algebra And Numerical Analysis), Winter 2024.
- Teaching Assistant, AMATH 352 (Introduction to Differential Equations), Spring 2026.
- Teaching Assistant, CFRM 420 (Computational Finance and Financial Econometrics), Autumn 2024.
- Teaching Assistant, MATH 124-126 (Calculus with Analytic Geometry), Autumn 2022, Winter 2023, Spring 2023, Autumn 2023.

- **Lebanese American University**

- Teaching Assistant, MTH 207 (Discrete Structures), Fall 2020.

HONORS AND AWARDS

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| • O'Molloy Fellowship | Mar - Jun, 2025 |
| • Provost Recruitment Funds Fellowship | Mar - Jun, 2024 |
| • Carl E. Pearson Award for Outstanding Performance | June, 2023 |
| • LAU Highest GPA Award in Mathematics and Computer Science | May, 2022 |

SERVICE

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| • SIAM UW Chapter Secretary | 2024 - 2025 |
| • Numerical Analysis Research Club Student organizer | Autumn 2024 |
| • LAU Math Club Treasurer | 2021 - 2022 |

SKILLS SUMMARY

- **Programming:** Julia, Matlab, Python, Mathematica, R.
- **Languages:** Arabic - Native speaker, English – Advanced proficiency, French – Conversational.

PROFESSIONAL MEMBERSHIPS

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| • International Linear Algebra Society (ILAS) | 2025 - Present |
| • Society for Industrial and Applied Mathematics (SIAM) | 2022 - Present |
| • American Mathematical Society (AMS) | 2022 - Present |