Timothy Yun-Chung Lund

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Education

Houghton University Sep 2019–Present

Bachelor of Science expected May 2023

Majors: Mathematics & Computer Science
Minor: Digital Animation Techniques
GPA: 3.88/4.0

Research Experience

Senior Honors Research Sep 2022–Apr 2023

Supervisor: Dr. Rebekah Yates • Houghton University
Topic: Finite field numerical ranges

We investigated the numerical ranges of square matrices with entries from finite fields, namely $Z_7[i]$. We devoted particular attention to the numerical ranges of matrices with self-orthogonal eigenvectors.

Discrete and Continuous Analysis in Appalachia Jun 2022–Aug 2022

Supervisor: Dr. Tom Cuchta • Fairmont State University
Topic: The polynomial shift operator on time scales

We attempted to derive a functional representation for the polynomial shift operator on the quantum time scale. The main approach we used involved taking the Laplace transform of a polynomial function, differentiating in the complex numbers, and then taking the inverse Laplace.

Topic: The discrete Anger function

We derived a discrete analogue to the continuous Anger function by solving the discrete Anger differential equation. We then investigated various properties of the discrete Anger function, including its hypergeometric representation, recurrence relations, and derivative relations.

Computer Science Collaborative Research Sep 2021–Dec 2021

Supervisor: Dr. Wei Hu • Houghton University
Topic: Comparing the diversity and similarity of molecules generated by GAN, VAE, Flow, and Diffusion models using SELFIES

We explored four different approaches to generating molecules as SELFIES strings, evaluating the diversity scores and Tanimoto similarity for each method.

Research Experience (cont'd)

Computational Methods with Apls. in Materials Science Jun 2021–Aug 2021

Supervisor: Dr. Gautam Rupak • Mississippi State University
Topic: Bayesian parameter estimation and model comparison for $^{14}C(n,\gamma)^{15}C$

We used the Bayesian nested sampling algorithm implemented in Python to determine unknown parameters and compare models for neutron capture on carbon-14.

Mathematics Research Seminar Jan 2021–May 2021

Supervisor: Dr. Brandon Bate • Houghton University
Topic: Patterns in the coefficients of Chebyshev polynomials of the second kind

We summed the coefficients of Chebyshev polynomials and arranged them in a triangular array, observing fractal-like characteristics in their prime factorizations that appear similar to those in Pascal's triangle.

Presentations

Houghton University · Houghton, NY Apr 2023

Honors Thesis Defense

Topic: Finite field numerical ranges

Houghton University · Houghton, NY Apr 2023

Math & Science Colloquium

Topic: Finite field numerical ranges

Houghton University · Houghton, NY Mar 2023

Math & Science Colloquium

Topic: Infinite beauty—Exploring mathematics within the art of M. C. Escher

Joint Mathematics Meetings · Boston, MA Jan 2023

AMS-PME Student Poster Session

Topic: The polynomial shift operator on time scales

Houghton University · Houghton, NY Nov 2022

Math & Science Colloquium

Topic: The polynomial shift operator on time scales

West Virginia University · Morgantown, WV Jul 2022

Undergraduate Research Symposium

Topics: The discrete Anger function, The polynomial shift operator on time scales

Presentations (cont'd)

Houghton University · Houghton, NY Nov 2021

Math & Science Colloquium

Topic: Bayesian parameter estimation and model comparison for $^{14}C(n,\gamma)^{15}C$

Mississippi State University · Mississippi State, MS Jul 2021

Undergraduate Research Symposium

Topic: Bayesian parameter estimation and model comparison for $^{14}C(n,\gamma)^{15}C$

Work Experience

Multicultural Center Ambassador Sep 2021–Present

- Lead ambassador since September 2022
- Planned educational opportunities open to all campus
- Introduced a series of community-building activities for students of color
- Coordinated student multicultural groups
- Supported multicultural students in individual and administrative capacities

Teaching Assistant: STEM Reason & Abstraction Sep 2022–Dec 2022

- Assisted non-science major students with concepts in class
- Ran weekly help sessions to assist struggling students

Grader: Multivariate Calculus Sep 2021–Dec 2021

- Graded assignments and provided feedback to students

Grader: Differential Equations Sep 2020–Dec 2021

- Graded assignments and provided feedback to students

Tutor: Humanities 101, 102 Sep 2020–May 2021

- Guided students in understanding and analyzing literary texts

Technical Skills

Programming Languages

Python · Java · Scala · SQL · R · Arduino · LaTeX

Design Software

Autodesk Maya · Fusion 360 · AutoCAD · Adobe Suite

Honors and Awards

Teaching Assistantship, Department of Mathematics
Rensselaer Polytechnic Institute
Offered for Fall 2023–Spring 2024

Mathematical Achievement Award: Outstanding Graduating Senior
Houghton University
April 2023

MANRRS Resumé Competition: 2nd Place
Houghton University
February 2023

Ortlip Gallery Juried Student Exhibition: 3rd Place
Houghton University
February 2023

Adrien R. LaBombarde Math Scholarship
Houghton University
Fall 2021–Spring 2023

President's List
Houghton University
Fall 2020 · Fall 2022

Dean's Honor List
Houghton University
Fall 2019 · Spring 2020 · Spring 2021 · Fall 2021

Dean's List
Houghton University
Spring 2022

Institutional Involvement

Intercultural Student Association Sep 2021–Present

- President since January 2021
- Scheduled and moderated weekly cabinet meetings
- Organized campus-wide events celebrating global cultures
- Managed the transition to a new faculty advisor in January 2021

Institutional Involvement (cont'd)

Diversity Committee Sep 2021–Present

- Reviewed a campus-wide survey to evaluate cultural climate

Martin Luther King Jr. Day Planning Committee Sep 2021–Present

- Planned campus-wide festivities and educational activities for MLK Day

International Student Pre-Orientation Leader Aug 2021–Sep 2022

- Coordinated arrival and move-in for incoming international students
- Organized community-building activities for students
- Led workshops and discussions on cultural transition

Languages

English · Fluent

Mandarin Chinese · Proficient

References

Dr. Rebekah Yates · Houghton University

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Dr. Tom Cuchta · Fairmont State University

Assistant Professor of Mathematics

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Dr. Gautam Rupak · Mississippi State University

Professor of Nuclear Theory

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