Hannah Park-Kaufmann

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Education

B.A. in Mathematics, B.M. in Classical Piano Performance 2020-2024 (expected)
Bard College Annandale-on-Hudson, NY
Cumulative GPA: 3.82/4.00

Research Experience

MIT.nano Immersion Lab Research Intern and Visiting Student + Study Lead - Physiological Correlates of Healthy vs. Injury-prone Pianist Movement 01.2023 - 05.2023 and 07.2023 - present
MIT - Department of Mechanical Engineering (Virtual) | Cambridge, MA
- Designed experiment script, recruited subjects, managed IRB protocol, directing data collection and analysis towards understanding the physiology of pianist movement. **Advisors:** Dr. Praneeth Namburi, Dr. Brian Anthony

Topology REU Researcher - Topological Methods for Combinatorics and Data Analysis 05.2023 - 07.2023
Carnegie Mellon University - Department of Mathematical Sciences Pittsburgh, PA
- Introduced topological generalizations to derive results in zero-sum Ramsey theory.
- Investigated nerve complexes & minimal distortion embeddings. **Advisors:** Prof. Florian Frick, Prof. Steven Simon

Murthy Lab Research Intern - Ant Gait Analysis On Video Data With Comp. Ethology 08.2022 - 09.2022
Harvard University - Department of Molecular and Cellular Biology Cambridge, MA
- Assembled cleaning, dimensionality reduction & modeling pipeline. **Advisor:** Dr. Souvik Mandal

Comp. Math & Data Science REU Researcher - Data Assimilation for Geophysics Models 06.2022 - 08.2022
Emory University - Department of Mathematics, Scientific Computing Group Atlanta, GA
- Integrated an Ensemble Kalman filter to improve simplified glacier model's predictions; coupled a storm surge model to explore sea level rise impact on storm surges. **Advisor:** Prof. Talea Mayo

Numerical Semigroups and Polyhedra REU Researcher - Minimal Presentation Sizes 06.2021 - 08.2021
Polymath Jr. REU (Virtual)
- Introduced a combinatorial approach involving posets to determine the attainable minimal presentation sizes given a fixed multiplicity. **Advisor:** Prof. Christopher O'Neill

Publications

[1] Florian Frick, Jacob Lehmann Duke, Meenakshi McNamara, **Hannah Park-Kaufmann**, Steven Simon, Darrion Thornburgh, Zoe Wellner. Topological methods in zero-sum Ramsey theory. *Submitted to Forum of Mathematics, Sigma*. arXiv:2310.17065 (2023)

[2] Ceyhun Elmacioglu, Kieran Hilmer, Christopher O'Neill, Melin Okandan, **Hannah Park-Kaufmann**. On the cardinality of minimal presentations of numerical semigroups. *Submitted to Algebraic Combinatorics*. arXiv:2211.16283 (2022).

[3] Emily Corcoran, Logan Knudsen, Talea Mayo, **Hannah Park-Kaufmann**, Alexander Robel. Ensemble Kalman Filtering for Glacier Models. *Submitted to La Matematica*. arXiv:2210.02647 (2022).

Grants & Awards

- Bard...: Distinguished Scientist Scholar (DSS) Award ($10,000) - Independent Research Grant from Bard-President Botstein ($2,000) - DSS Independent Summer Research Grant ($1,500) - Anonymous community donation for my research ($1,000) - Mind, Brain and Behavior Award ($700) - Seniors to Seniors Award ($625) - Community Action Award ($350)
- Education track 1st place winner | Top 10 overall project at HackMIT 2023 (International MIT Hackathon)
  Sustainability track 1st place winner | Top 10 overall project at HackMIT 2022 (International MIT Hackathon)
- 1st place winner at: International piano competition "Piano Talents" | Austrian national piano comp. "Prima la Musica"

Outreach, Teaching & Leadership

Math Tutor at Green Haven Correctional Facility and Eastern Correctional Facility 02.2022 - present
Bard Prison Initiative (BPI) and Math Department Green Haven | Napanoch | Annandale-on-Hudson, NY

President of Association for Women in Mathematics (AWM) Club & Chapter 09.2022-present
Bard College Annandale-on-Hudson, NY

Member of Outreach Committee 06.2022 - 08.2022
Emory University Computational Mathematics for Data Science REU+RET Atlanta, GA

Relevant Skills

Languages: English (native), German (native), Chinese (fluent), Korean (conversational), French (beginner)
Programming: Proficient in Python, Java and MATLAB, and experience with Mathematica, C++ and R