NSF BIOGRAPHICAL SKETCH

NAME: Lovitz, Benjamin

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POSITION TITLE & INSTITUTION: Teaching assistant, University of Waterloo

(a) PROFESSIONAL PREPARATION -(see PAPPG Chapter II.C.2.f.(a))

INSTITUTION	LOCATION	MAJOR / AREA OF STUDY	DEGREE (if applicable)	YEAR YYYY
Bates College	Lewiston, Maine	Double degree in Mathematics and Physics (Honors)	BA	2015
University of Waterloo	Waterloo, Ontario	Physics (Quantum Information)	MS	2017
University of Waterloo	Waterloo, Ontario	Applied Mathematics (Quantum Information)	PHD	2022

(b) APPOINTMENTS -(see PAPPG Chapter II.C.2.f.(b))

2015 - present Teaching assistant, University of Waterloo
2019 - 2019 Fall course instructor MATH 127, University of Waterloo
2015 - 2015 Summer research assistant to Norbert Lütkenhaus, University of Waterloo
2014 - 2014 Winter research assistant to Catherine Buell, Bates College
2014 - 2014 Summer research assistant to Nathan Lundblad, Bates College
2014 - 2014 Summer mathematics REU, SUNY Potsdam, NY

(c) PRODUCTS -(see PAPPG Chapter II.C.2.f.(c))

Products Most Closely Related to the Proposed Project

1. Lovitz B, Petrov F. A generalization of Kruskal's theorem on tensor decomposition. Submitted to Forum of Mathematics, Sigma. 2021 October. Available from: https://arxiv.org/abs/2103.15633v2
2. Lovitz B, Steffan V. New techniques for bounding stabilizer rank. Submitted to Quantum. 2021 October. Available from: https://arxiv.org/abs/2110.07781
3. Lovitz B, Johnston N. Entangled subspaces and generic local state discrimination with pre-shared entanglement. Submitted to Quantum. 2021 October. Available from: https://arxiv.org/abs/2010.02876v2
4. Lovitz B. On decomposable correlation matrices. Linear and Multilinear Algebra. 2019 August; 69(11):2115-2129. Available from: https://www.tandfonline.com/doi/full/10.1080/03081087.2019.1661347
5. Johnston N, Lovitz B, Puzzuoli D. The Non-m-Positive Dimension of a Positive Linear Map. Quantum. 2019 August; 3:172. Available from: https://quantum-journal.org/papers/q-2019-08-12-172/

Other Significant Products, Whether or Not Related to the Proposed Project

1. Lovitz B, Lütkenhaus N. Families of quantum fingerprinting protocols. Physical Review A. 2018 August; 97(3). Available from: https://link.aps.org/doi/10.1103/PhysRevA.97.032340

2. Touchette D, Lovitz B, Lütkenhaus N. Practical quantum appointment scheduling. Physical Review A. 2018 February; 97(4). Available from: https://link.aps.org/doi/10.1103/PhysRevA.97.042320
3. Alvir R, Dever S, Lovitz B, Myer J, Tamon C, Xu Y, Zhan H. Perfect state transfer in Laplacian quantum walk. Journal of Algebraic Combinatorics. 2015 October; 43(4):801-826. Available from: http://link.springer.com/10.1007/s10801-015-0642-x

(d) SYNERGISTIC ACTIVITIES -(see PAPPG Chapter II.C.2.f.(d))

1. Mentoring: In collaboration with William Slofstra, the PI is mentoring Daniel Han, an undergraduate student, for the Fall 2021 term. The PI has independently devised Daniel's research project, which involves computing (in Sage) r-entanglers (see Objective 2(c) in the project description). The PI holds twice-weekly meetings with Daniel.
2. Teaching: The PI completed the "Fundamentals of University Teaching Program" offered by the University of Waterloo Centre for Teaching Excellence, consisting of six workshops and three micro-teaching sessions. This program helped the PI to develop an evidence-based approach to teaching, which he applied in MATH 127 as a course instructor. His students rated his delivery 4.0/5 in the course evaluations, and his course coordinator, Owen Woody, wrote, "I had only praise to offer after being a guest in his lecture."
3. Community engagement: The PI participated in the three-month-long program "Tensor methods and Emerging Applications to the Physical and Data Sciences" offered by the Industry for Pure and Applied Mathematics, held online due to COVID-19. During the program, he gave two research presentations (one talk and one poster), and began several successful collaborations on Objective 1 and Objective 2(b) in the project description.
4. Research dissemination: The PI takes every opportunity to disseminate his research. This calendar year, he has been invited to speak at ten research seminars, and has presented at three poster sessions. He also produced a short video describing his research, for which he received third place in the Banff international "Cut to the Chase" video competition. This video is freely available on his website.
5. www.benjaminlovitz.com: As part of the PI's commitment to open-access education, he maintains a personal website that includes information about his research approachable to a non-specialist audience; his successful scholarship/grant applications as a resource for future applicants; and open-access links to course materials, publications, and talks (slides, and videos when available).