## Shosuke Kiami

kiami.sho@gmail.com • (206) 383-5764 • shokiami.com

Education	<b>University of Washington</b> , Seattle WA Non-Matriculated Research Student	Sep 2024 - Jun 2025	
	<b>University of Washington</b> , Seattle WA B.S. in Computer Science, B.A. in Mathematics Cumulative GPA: 3.98/4.00 Honors: Magna Cum Laude, Phi Beta Kappa, Annual Dean's List	Sep 2020 - Jun 2024	
PUBLICATIONS	<ul> <li>Shosuke Kiami. First-order hold lossless convexification: theoretical gamma time optimal control problems. <u>arXiv:2411.18004</u>.</li> <li>Planned submission to <i>IEEE Conference on Decision and Control</i></li> </ul>	guarantees for discrete- 2025.	
	<ul> <li>Alex Albors, François Clément, Shosuke Kiami, Braeden Sodt, Ding Yifan, Tony Zeng.</li> <li>Approximately Jumping Towards the Origin. <u>arXiv:2412.04284</u>.</li> <li>Under revision at <i>Involve 2025</i>.</li> </ul>		
	<ul> <li>Chris Jennings-Shaffer, David H Rich, Matthew Macaulay, Michael D Karcher, Tanvi Ganapathy, Shosuke Kiami, Anna Kooperberg, Cheng Zhang, Marc A Suchard, Frederick A Matsen IV. Finding high posterior density phylogenies by systematically extending a directed acyclic graph. <u>arXiv:2411.09074</u>.</li> <li>Under revision at Algorithms for Molecular Biology 2024.</li> </ul>		
	<ul> <li>Zoey Chen, Shosuke Kiami, Abhishek Gupta, Vikash Kumar. GenAug: Retargeting behaviors to unseen situations via Generative Augmentation. <u>arXiv:2302.06671</u>.</li> <li>Accepted to <i>Robotics: Science and Systems 2023</i>, awarded Best System Paper Finalist.</li> </ul>		
	<ul> <li>Michael Duan, Shosuke Kiami, Logan Milandin, Johnson Kuang, Michael Saugstad, Maryam Hosseini, and Jon E. Froehlich. Scaling Crowd+AI Sidewalk Accessibility Assessments: Initial Experiments Examining Label Quality and Cross-city Training on Performance. <u>dl.acm.org</u>.</li> <li>Accepted to ACM SIGACCESS Conference on Computers and Accessibility 2022.</li> </ul>		
Research Experience	<ul> <li>Autonomous Controls Lab, UW, Seattle WA</li> <li>Advisor: Behçet Açıkmeşe</li> <li>Single-authored a paper (arXiv) introducing a new optimal control lossless convexification theory from stepwise to piecewise-linear part</li> <li>Proved guarantees of the above algorithm using results from books st by Borwein &amp; Lewis and Numerical Optimization by Nocedal &amp; W</li> <li>Implemented various cutting-edge optimal control algorithms such cation with free-final-time and continuous-time constraint satisfact</li> </ul>	Jan 2024 - Present algorithm that extends cameterized controls. uch as <i>Convex Analysis</i> Vright. as successive convexifi- ion.	
	<ul> <li>Washington Experimental Mathematics Lab, UW, Seattle WA Advisor: Stefan Steinerberger</li> <li>Co-authored a paper (arXiv) examining a class of dynamical system</li> <li>Discovered and proved results for the stochastic variant, including garding the existence and expectation of the stationary measure in</li> <li>Used theory from Harris chains, measure-theoretic probability, and</li> <li>Presented at the Northwest Undergrad Math Symposium 2024, received</li> </ul>	Sep 2024 - Dec 2024 s in the complex plane. ; our main theorem re- higher dimensions. l integral equations. eiving 2nd place prize.	
	<ul> <li>Abstract Algebra Independent Reading, UW, Seattle WA Advisor: William Monty McGovern</li> <li>Independent reading of Abstract Algebra by Dummit &amp; Foote.</li> <li>Weekly proof exercises and one-on-one discussions covering group,</li> </ul>	Aug 2024 - Mar 2025 ring, and field theory.	

WEIRD Robot Learning Lab	, UW,	Seattle	WA
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Advisor: Abhishek Gupta

- Collaborated on a paper (arXiv) introducing generative models as an effective data augmentation technique for robot learning, winning Best System Paper Finalist at RSS 2023.
- Proved results about Markov decision processes and KL-divergence of distributions.

Matsen Group, Fred Hutchinson Cancer Center, Seattle WAJun 2021 - Sep 2021Advisor: Frederick Matsen

- Contributed to a paper (<u>arXiv</u>) introducing the sDAG: a data structure that compactly represents a collection of phylogenetic trees in order to perform Bayesian inference.
- Developed fast tree rearrangement algorithms necessary for MCMC steps.
- Proved combinatorial results such as the number of such graphs on a given set of taxa.
- Attended talks covering inverse problems, variational inference, Bayesian networks, etc.

Makeability Lab, UW, Seattle WA	
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UW Symphony Orchestra, Cellist

Jun 2020 - Jun 2022

- Advisor: Jon Froehlich
- Started an initiative to use deep learning for automatic sidewalk accessibility evaluation.
- Co-authored a paper (dl.acm.org) examining model performance across international cities.

Work Experience	<ul><li>Software Engineering Intern, Apple, San Diego CA</li><li>Introduced an improved adaptive bitrate algorithm reducing runtim</li></ul>	Jun 2023 - Sep 2023 e from $O(n^2)$ to $O(n)$ .	
	<ul><li>Software Engineering Intern, Microsoft, Redmond WA</li><li>Designed a custom image segmentation algorithm reducing runtime</li></ul>	Jun 2022 - Sep 2022 from 80 ms to $0.5$ ms.	
Teaching Experience	<ul><li>Fusion Math, Math Tutor, Seattle WA</li><li>Taught lessons covering curriculum in AP Calculus.</li></ul>	Jan 2025 - Present	
	<ul><li>CS Tutor, Self-employed, Seattle WA</li><li>Taught lessons covering curriculum in AP Computer Science.</li></ul>	Mar 2022 - Jun 2022	
	<ul><li>Seattle Music Partners, Cello Teacher</li><li>Taught cello lessons to students at underserved elementary schools.</li></ul>	Sep 2016 - Jun 2020	
PERSONAL       Euclideate       Now         PROJECTS       • A highly-optimized C++ algorithm that solves straightedge + compass co       lems, with the goal of finding/proving the minimal construction of the 17		Nov 2024 - Present bass construction prob- the 17-gon ( <u>GitHub</u> ).	
	<ul> <li>DanceTime May 2021 - Jul 2023</li> <li>A C++ Just Dance remake with a custom gesture scoring algorithm using pose estimation, conditional filtering, polynomial regression, and numerical optimization (<u>GitHub</u>).</li> </ul>		
	<ul><li>AlphaFour</li><li>A Python Connect 4 AI that learns via self-play deep reinforcement</li></ul>	Jun 2022 - Jul 2023 t learning ( $\underline{\text{GitHub}}$ ).	
	<b>GeoKnowr</b> • A Python <i>GeoGuessr</i> AI that reliably guesses within 2000 km of the g	Nov 2022 - Dec 2022 ground truth ( $\underline{\text{GitHub}}$ ).	
Extra- curriculars	<ul> <li>UW Formula Motorsports, Engineer Jan 2023 - Jun 2024</li> <li>Designed the team's first driverless steering system (motor + custom rack and pinion).</li> <li>Developed model predictive control algorithms for the above system.</li> </ul>		
	<b>UW Chamber Music</b> , Cellist	Jan 2022 - Jun 2022	
	<b>UW Taiko Kai</b> , Taiko Drummer	Sep 2021 - Jun 2022	

Sep 2020 - Dec 2021