Jānis Lazovskis

	Latvijas Uni Jelgavas iela Riga, LV-10 Latvia	versitāte a 3—615 04	ORCID: 0000-0002-3285-7522 homepage: jlazovskis.com twitter: jlazovskis github: jlazovskis	
Specialization		Algebraic topology, computational mathematics, topological data analysis, topologi- cal neuroscience, data visualization, stratified spaces, configuration spaces.		
Academic affiliations		University of Latvia (Riga, Latvia): Researcher Riga Technical University (Riga, Latvia): Assistan	t Professor (<i>Docents</i>)	
Education		University of Illinois at Chicago, Chicago, Illinois, PhD (Doctor of Philosophy, 2019) • Stability of universal constructions for persister • Advised by Benjamin Antieau	USA nt homology	
		University of Waterloo, Waterloo, Ontario, Canad MMath (Master of Mathematics, 2014) • Characterizations of the Chern characteristic cl • Co-advised by Benoit Charbonneau and Spiro k	a <i>asses</i> Karigiannis	
		University of Waterloo , Waterloo, Ontario, Canad BMath (Bachelor of Mathematics, 2013) · Honours Pure Mathematics & Combinatorics and	a I Optimization (with distinction)	
Positions held 2025.03 - : 2021.01 - 2021.07 : 2020.09 - 2020.12 : 2020.09 - 2020.12 : 2011.04 - 2011.06 :		University of Latvia , Riga, Latvia. Researcher (<i>Pētnieks</i>) in the Institute of Clinical and Preventive Medicine Visiting Assistant Professor (<i>Viesdocents</i>) in the Department of Mathematics Lecturer in the Department of Mathematics Senior Expert in the Laboratory of Magnetic Soft Materials Research Assistant in quantum algorithms to Andris Ambainis		
2024.(2023.(03 - 2024.10 : 09 - 2024.03 :	Printful , Riga, Latvia. Data Scientist, Data Analytics & Science Team Data Analyst, Data Analytics & Science Team		
2022.(2021.(2020.(02 - 2024.10 : 09 - 2023.08 : 08 - 2022.02 :	Riga Technical Unversity , Riga, Latvia. Assistant Professor (<i>Docents</i>) in RTU Riga Busi Academic Coordinator in ERAF project 1.1.1.5/1 Lecturer in RTU Riga Business School	ness School 18/1/008 "Buffalo project"	
2020.0 2019.0	08 - 2023.08 : 08 - 2020.08 :	University of Aberdeen , Aberdeen, Scotland, Unite Honorary Research Fellow in the Institute of Mat Research Assistant in EPSRC project "Topologic	ed Kingdom. thematics cal Analysis of Neural Systems"	
2016.0 2014.0	08 - 2016.12 : 08 - 2019.05 :	University of Illinois at Chicago , Chicago, Illinois, Research Assistant to Benjamin Antieau Teaching Assistant in the Department of Mather	USA. natics	
Funding av	varded	Efficient topological signatures for representation lea Latvian Council of Science program "1.1.1.9 Postdoctoral res 2025.03 - 2028.03, 190k EUR	arning in medical imaging ^{earch} "	
Publicatior	15]	An application of neighbourhoods in digraphs to the With P.R. da Conceicao, D. Govc, R. Levi, H. Riihimaki, J.P. June 2022. Published in "Network Neuroscience".	<i>classification of binary dynamics</i> Smith.	

- Modeling and Simulation of Neocortical Micro- and Mesocircuitry. Part I: Anatomy With M.W. Riemann, D.E. Santander and others August 2024. Published in "eLife Neuroscience".
- 3. *Pruning vineyards: updating barcodes by removing simplices* With B. Giunti

September 2023. Presented at "Computational Persistence" workshop, submission to "Symposium of Computational Geometry" in preparation.

4. Combinatorial Exploration of Morse–Smale Functions on the Sphere via Interactive Visualization

With Y. Zhou, M.J. Catanzaro, M. Zabka, B. Wang. October 2023. Published in "Topological Data Analysis and Visualization 2023" conference.

 Heterogeneous and non-random cortical connectivity undergirds efficient, robust and reliable neural codes

With D.E. Santander, C. Pokorny and others March 2024. Submitted to "iScience".

 DONUT - Creation, development, and opportunities of a database With B. Giunti and B. Rieck November 2023. Published in "Notices of the American Mathematical Society".

- 7. *Moduli Spaces of Morse Functions for Persistence* With M.J. Catanzaro, J.M. Curry, B.T. Fasy, G. Malen, H. Riess, B. Wang, M. Zabka. June 2020. Published in "Journal of Applied and Computational Topology"
- Topology of synaptic connectivity constrains neuronal stimulus representation, predicting two complementary coding strategies
 With M.W. Riemann, H. Riihimaki, J.P. Smith, C. Pokorny, R. Levi. January 2022. Published in "PLOS ONE".
- 9. *Stratifications on the Ran Space* June 2021. Published in "Order".

Topologically aware inferences from high-dimensional samples: hypervolume-t Inferencing, sparsification, normalization on point clouds in C++ and R Creator and maintainer: Active 2024.09 -

Modern persistence algorithms for dynamic topological signatures: phat-vineyards Implementation and benchmarking of persistent homology update method in C++ presented in publication 3, extended to any dynamic situation Co-creator and maintainer: Active 2024.08 -

> Internal Python package for convenient querying: pftools Custom software to connect Python to corporate MySQL and PostgreSQL databases Creator and maintainer: Active 2023.11 - 2024.10

> > A pipeline for classifying binary dynamics on digraphs: TriDy Contributed mathematical functions in Python and user interface Contributor: Active 2021.04 - 2024.08

Activation of neurological circuits for topological analysis: neurotop-nest Contributed workflow, visuals, and user interface Creator: Active 2020.04 - 2021.06

> Exploring Morse–Smale functions on the sphere: MSF Designer Mathematical foundations, testing, documentation Contributor: Active 2019.05 - 2022.06

Conferences

- (organizer) Thematic session "Mathematical and statistical models to predict and protect tropical species and ecosystems: A new era"
 8th European Conference of Tropical Ecology 2025 (with J. Morimoto, R. Levi).
- 2. (talk) Topological methods in computational ecology

ECTE 2025 (with J. Morimoto, R. Levi).

- 3. (poster) *MVF Designer: Design and Visualization of Morse Vector Fields.* ATMCS 2020 (with Y. Zhou, M.J. Catanzaro, M. Zabka, B. Wang).
- (talk) Stratifications and sheaves on the Ran space.
 AMS Joint Mathematics Meetings, Special Session on Topological Data Analysis, January 2019
- (organizer) Graduate student topology and geometry conference.
 Held at University of Illinois at Chicago, April 7-8 2018 (with K.Quinn, N.Lopez and others).
- (talk) Complex bordism theory.
 West Coast Algebraic Topology Summer School, July 2016 (with Maximilien Péroux).
- (talk) Khovanov homology.
 West Coast Algebraic Topology Summer School, July 2014 (with Robin Koytcheff).

Undergraduate mathematics PBM 778: Introduction to Linear Algebra (lecturer, 2021 - 2023) PBM 763: Introduction to Discrete Structures (teaching assistant, 2021 - 2022) PBM 797: Introduction to Probability (teaching assistant, 2021 - 2022) PBM 713: Mathematics (teaching assistant, 2020 - 2022) Matemātika 2065: Mathematical analysis IV (teaching assistant, 2021) Matemātika 1105: Mathematical analysis II (teaching assistant, 2021) Matemātika 1027: Mathematical analysis I (teaching assistant, 2020) Math 294: Introduction to Advanced Mathematics (workshop instructor, 2018) Math 182: Calculus II (workshop instructor, 2016 - 2019) Math 188: Linear algebra for engineers (teaching assistant, 2021) Math 116: Calculus II for engineers (teaching assistant, 2014) Math 115: Calculus I for engineers (teaching assistant, 2013) Postgraduate mathematics Math 589: Teaching and Presentation of Mathematics (teaching assistant, 2017) Pure Math 667: Algebraic topology (teaching assistant, 2014) Math 589: Teaching and Presentation of Mathematics (mentor, 2022 -) PBM 776: Introduction to Visualization (laboratory instructor, 2022 - 2023) PBM 776: Introduction to Visualization (laboratory instructor, 2022 - 2023) PBM 766: Data Structures (teaching assistant, 2020 - 2022)		
Community service	2x2 Latvian Seminars (board member, 2019 - 2024) Friends of Sydney Academy Debate Society (board member Graduate Employees Organization (communications chair,	er, 2017 -) 2017 - 2019)
Language skills	Fluent in English, Latvian. Good command of French. Basic knowledge of Russian.	
Computer skills	Fluent in Python, Mathematica, LaTeX, HTML. Deep skills in SQL, PowerBI, Excel, Julia. Working proficiency with C++, R, parallel processing. Familiar with JavaScript, Slurm, HPCs. Experience with C, C#.	
	Ran Levi, University of Aberdeen email: r.levi@abdn.ac.uk	References
	Kathryn Hess, École Polytechnique Fédérale de Lausanne email: kathryn.hess@epfl.ch	

Benjamin Antieau, Northwestern University email: antieau@northwestern.edu

Shmuel Weinberger, University of Chicago email: shmuel@math.uchicago.edu

Brittany Fasy, Montana State University email: brittany.fasy@montana.edu