Attila Lovas

Curriculum Vitae

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Personal information

Birth June 6th, 1989 at Kecskemét (Hungary)

Citizenship Hungarian

Driving License A, B

LinkedIn `www.linkedin.com/in/attila-lovas`

Scientific activities

Fields of interest

- Machine learning
- Financial mathematics
- Statistical models in epidemiology
- Probability theory
- Quantum information geometry
- Entanglement theory
- Inverse problems in biomechanics
- Mathematical modeling

Publication statistics

- Total number of publications: 18
- Citations: 35
- h-index: 3
- Journal papers: 9
- Conference proceedings: 9

Publications are listed at the end of the document.

Reviewing activities

- Analysis Mathematica
- Quantum Information Processing

Industrial mathematics research projects

Jun. 2019 – Dec. 2019 **Contract work for BOSCH**, *Applying photorealistic fog on an RGB image*, Number of participants: 2.

Teaching activities

2019 Analysis 1 in English (and partly in Russian) for foreign students at the BUTE *Fac. of Nat. Sc. Dept. of Analysis*

2017 Functional analysis for physicists, probability theory and statistics for engineering students at the BUTE *Fac. of Nat. Sc. Dept. of Analysis*

2016– "Homework solving" seminar for matmematicians at the BUTE *Fac. of Nat. Sc. Dept. of Analysis*

2008–2018 Real- and complex analysis, linear algebra and ordinary differential equations for engineering students at the BUTE *Fac. of Nat. Sc. Dept. of Analysis*

2011 Evaluation of differential geometry exams at the BME *Fac. of Nat. Sc. Dept. of Geometry*

Employment

Sep. 2018– Present **Research Fellow**, *Alfréd Rényi Institute of Mathematics*, Probability and Mathematical Finance.

Feb. 2018– Present **Assistant Professor**, *Budapest University of Technology and Economics*, Department of Analysis.

Sep. 2017– Feb. 2018 **University Assistant**, *Budapest University of Technology and Economics*, Department of Analysis.

Jul. 2017– Aug. 2018 **Technology Intern**, *MSCI Inc.*, Budapest, Intern position.
I develop test automation tools for MSCI Analytics Platform in Python (numpy, pandas, lxml).

Sep. 2014– Dec. 2014 **Matlab Developer**, *MSCI Inc.*, Budapest, Part time job during my PhD studies..
I developed test automation tools for BARRA products in MATLAB.

2010–2014 **External lecturer**, *Budapest University of Technology and Economics*, Budapest, Hungary.

2008–2009 **Instructor in inorganic chemistry laboratory**, *Budapest University of Technology and Economics*, Department of Inorganic Chemistry.

Studies

2019–2021 (expected) **MSc in Economics**, *Corvinus University of Budapest*.

2014–2017 **PhD studies**, *Budapest University of Technology and Economics*, Doctoral School of Mathematics and Computer Science, The grade of the degree being: summa cum laude.

2012–2014 **MSc in Mathematics**, *Budapest University of Technology and Economics*, Faculty of Natural Sciences, The grade of the degree being: excellent with highest honours.

2010–2012 **BSc in Mathematics**, *Budapest University of Technology and Economics*, Faculty of Natural Sciences, The grade of the degree being: excellent with highest honours.

2007–2011 **BSc in Chemical Engineering Sciences**, *Budapest University of Technology and Economics*, Faculty of Chemical Technology and Biotechnology, The grade of the degree being: excellent.

Computer Skills

Tools

LaTeX	advanced level	Microsoft Word/Excel	intermediate level
Git	basic level	JIRA	basic level

Languages

Python	advanced level	MATLAB	advanced level
C/C++	basic level	Wolfram *Mathematica*	advanced level

Language skills

Hungarian	Mother tongue	
English	Very good command	*State accredited language examination B2*
German	Very good command	*State accredited language examination B2*
Russian	Very good command	*State accredited language examination B2*

Hobbys

- Reading
- Cooking
- Learn languages
- Motocycling
- Hiking

Organization membership

2015–Present János Bolyai Mathematical Society

2009–Present Hungarian Chemical Society

Prizes, awards

2018 **Géza Grünwald Commemorative Prize for young researchers**

2017 **Gyula Kőnig Young Researcher Award**

2011 **International Mathematics Competition for University Students**, *American University*, Blagoevgrad, Bulgaria.
Result: Honorable mention

2011 **Functional analysis competition**, *BUTE Department for Analysis*, Budapest, Hungary.
Result: First prize.

2011 **Mathematics competition**, *Budapest University of Technology and Economics*, Budapest, Hungary.
This competition was sponsored by Morgan Stanley. Result: Third prize.

2007 **International Chemistry Olympiad**, *Moscow State University*, Moscow, Russia.
Result: silver medal.

2007 **Chemistry competition for highschool students (OKTV)**, *Eötvös Lóránd Science University*, Budapest, Hungary.
Result: First prize.

2004 **International Junior Science Olympiad**, *Jakarta*, Indonesia, Result: silver medal.

List of Publications

Theses and Dissertations

1. A. Lovas. Az információgeometria alkalmazása kvantummechanikai rendszerekre. 2017. (PhD theses written in Hungarian)

Book Chapters

1. A. Lovas. *Information Geometry and Its Applications*, chapter Robertson-Type Uncertainty Principles and Generalized Symmetric and Antisymmetric Covariances, pages 445–456. Springer International Publishing, 2018.

Articles in Refereed Scientific Journals

1. A. Lovas, R. Nagy, P. Sótonyi, and B. Szilágyi. Volumetric flow rate reconstruction in great vessels. *Annales Mathematicae et Informaticae*, 2019.
2. M. Berczeli, B. Szilágyi, A. Lovas, D Pál, Z. Oláh, K. Törő, and P. Sótonyi. Meteorológiai paraméterek változásának hatása a halálos kimenetelű aorta aneurysma-rupturákra. *Orvosi Hetilap*, 159(37):1501–1505, 2018.
3. A. Lovas and Attila Andai. Volume of the space of qubit-qubit channels and state transformations under random quantum channels. *Reviews in Mathematical Physics*, 30(10):1850019, 2018.
4. A. Lovas and A. Andai. Invariance of separability probability over reduced states in 4× 4 bipartite systems. *Journal of Physics A: Mathematical and Theoretical*, 50(29):295303, 2017.
5. I. Szalóki, A. Gerényi, G. Radócz, A. Lovas, B. De Samber, and L. Vincze. Fpm model calculation for micro X-ray fluorescence confocal imaging using synchrotron radiation. *Journal of Analytical Atomic Spectrometry*, 32(2):334–344, 2017.
6. A. Lovas and A. Andai. Refinement of robertson-type uncertainty principles with geometric interpretation. *International Journal of Quantum Information*, 14(02):1650013, 2016.
7. K. Törő, R. Pongrácz, J. Bartholy, A. Váradi-T, B. Marcsa, B. Szilágyi, A. Lovas, Gy. Dunay, and P. Sótonyi. Evaluation of meteorological and epidemiological characteristics of fatal pulmonary embolism. *International Journal of Biometeorology*, 60(3):351–359, 2016.
8. A. Lovas and A. Andai. Mértékek abszolút és szimmetrikus normákon. *Alkalmazott Matematikai Lapok*, (32):63–77.
9. R. Nagy, Cs. Csobay-Novák, A. Lovas, P. Sótonyi, and I. Bojtár. Non-invasive in vivo time-dependent strain measurement method in human abdominal aortic aneurysms: Towards a novel approach to rupture risk estimation. *Journal of Biomechanics*, 48(10):1876–1886, 2015.

Articles in Refereed Scientific Conferences

1. A. Lovas. Quantum homogenization and state randomization via random qubit quantum channels. In *XXVIII International Fall Workshop on Geometry and Physics*. Instituto de Ciencias Matemáticas, 2019.
2. A. Lovas, M. Constans, P. Sótonyi, and B. Szilágyi. Non-parametric learning algorithm for evaluating the influence of environmental factors on sudden medical emergencies. In Luís Meira-Machado and Gustavo Soutinho, editors, *Proceedings of the 34th International Workshop on Statistical Modelling*, volume 1. Instituto Nacional de Estatística, 2019.
3. A. Lovas. Quantum copulas. In *XVI International Conference on Quantum Optics and Quantum Information*. Belarusian Physical Society, 2019.
4. A. Lovas. Is the world more classical or more quantum? In *XXVI International Fall Workshop on Geometry and Physics*. University do Minho, 2017.
5. A. Lovas and A. Andai. On robertson-type uncertainty principles. In Kratochvíl Václav, editor, *Information Geometry and its Applications IV : Liblice, Czech Republic*, pages 28–29. MATFYZPRESS Publisher, Charles University in Prague, 2016.

6. A. Lovas and A. Andai. Volume of the space of qubit channels and the distribution of some scalar quantities on it. In Kratochvíl Václav, editor, *Information Geometry and its Applications IV : Liblice, Czech Republic*, pages 48–49. MATFYZPRESS Publisher, Charles University in Prague, 2016.
7. A. Lovas, R. Nagy, E. Csobo, B. Szilágyi, and P. Sótonyi. Numerical reconstruction of pulsatile blood ow from ecg-gated computer tomography data. In Zoltán Gerencsér and Zoltán Horváth, editors, *Book of Abstracts, BJMT Conference of Applied Mathematics 2016*. Széchenyi István University, Györ, 2016.
8. R. Nagy, Cs. Csobay-Novák, A. Lovas, P. Sótonyi, and I. Bojtár. Towards indirect in vivo measurement of material properties of aortic aneurysms: Determining the displacement field. In A. Huerta, E. Onate, and X. Oliver, editors, *Joint 11th World Congress on Computational Mechanics, WCCM 2014, the 5th European Conference on Computational Mechanics, ECCM 2014 and the 6th European Conference on Computational Fluid Dynamics, ECFD 2014*, pages 376–385. International Center for Numerical Methods in Engineering, 2014.
9. A. Lovas, P. Sótonyi, B. Szilágyi, A. Udvardy, I. Gallatz, and Z. Pathó. Study of reaction to physical stress – fizikai stresszre adott válasz tanulmányozása. In Zoltán Gerencsér and Zoltán Horváth, editors, *Book of Abstracts, BJMT Conference of Applied Mathematics 2012*. Széchenyi István University, Györ, 2012.

Preprints

1. A. Lovas, I. Lytras, M. Rásonyi and S. Sabanis Taming neural networks with TUSLA: Non-convex learning via adaptive stochastic gradient Langevin algorithms, 2020.
2. A. Andai and A. Lovas. Quantum Aitchison geometry. *arXiv preprint arXiv:2003.08582*, 2020.
3. A. Lovas and M. Rásonyi. Ergodic theorems for queuing systems with dependent inter-arrival times. *arXiv preprint arXiv:2004.01475*, 2020.
4. A. Lovas and M. Rásonyi. Markov chains in random environment and ergodicity of stochastic langevin dynamics. *arXiv preprint arXiv:1911.04377v1*, 2019.
5. A. Lovas and A. Andai. On the notation of quantum copulas. *arXiv preprint arXiv:1902.08460*, 2019.
6. A. Lovas and A. Andai. On the inverse of perturbed operators. *Preprint*, 2019.
7. B. Szilágyi, M. Berczeli, A. Lovas, Z. Oláh, K. Tőrö, and P. Sótonyi. The effects of changing meteorological parameters on fatal aortic catastrophes. *Preprint*, 2019.
8. A. Lovas, B. Szilágyi, E. Bosnyák, Zs. Komka, A. Oláh, P. Ács, B. Merkely, M. Tóth, E. Németh, M. Krepuska, Cs. Söti, and P. Sótonyi. Reaction kinetics modeling of extracellular hsp70 induced by norepinephrine during exercise stress test – a pilot study. *Preprint*, 2019.

Attila Lovas
Budapest, June 14, 2020