

Curriculum vitae

with list of publications

András József Tóbiás

as of February 26, 2024

Personal information

Name	András József Tóbiás
Academic qualification	PhD
Place and date of birth	Budapest, 16.05.1992
Nationality	Hungarian
Academic address	Department of Computer Science and Information Theory, Faculty of Electrical Engineering and Informatics, Budapest University of Technology and Economics, Műegyetem rkp. 3., 1111 Budapest, Hungary
Private address	Eperjes utca 32. fszt. 2, 1204 Budapest, Hungary
E-mail	tobias@cs.bme.hu
Spoken languages	Hungarian (native), English (C1), German (teaching experience), Latin (B2)
Programming knowledge	Basic knowledge in Wolfram <i>Mathematica</i> , Maple and Python (Sage). LaTeX.
Professional webpage	cs.bme.hu/ tobiás

Research interests

- *In mathematical biology*: adaptive dynamics, population dynamics, population genetics, epidemiological models; invasion dynamics, adaptation; dormancy, also in cancer growth models; horizontal gene transfer; clonal interference; interacting particle systems, particle systems with coordination, duality, branching processes, nonlinear dynamical systems, Fisher–KPP equation, contact process.
- *In stochastic geometry and other fields of probability*: point processes, continuum percolation, large deviations, Gibbsian models; spatial tessellations, signal-to-interference ratio, Boolean model, bounded-degree percolation.

Professional experience

September 2012 - June 2014	Student assistant at the Institute of Mathematics of the Budapest University of Technology and Economics
September 2014 - June 2016	Phase I (master) scholarship at the Berlin Mathematical School
July 2016 - March 2019	Phase II (PhD) scholarship at the Berlin Mathematical School
April 2019 - September 2022	Research assistant (postdoc) at TU Berlin in Noemi Kurt’s working group “Mathematical Stochastics with Applications to statistical Physics and Biology”
December 2022 - January 2024	Part-time research fellow at the Alfréd Rényi Institute of Mathematics (DYNASNET/NOISE)
September 2022 - (ongoing)	Senior lecturer/assistant professor at the Department of Computer Science and Information Theory of the Budapest University of Technology and Economics

Scientific stays, guest lecturerships

July 2024 (upcoming)	Guest lecturer at the Goethe-Universität Frankfurt (as part of the International Campus program of the university, 1 month)
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Education

2005–2011	High school: ELTE Radnóti Miklós School, Budapest
September 2011 - June 2014	Bachelor in Mathematics at the Budapest University of Technology and Economics. Bachelor's thesis: "The axiom system of classical harmony". Supervisor: Dr. Ákos G. Horváth
October 2014 - June 2016	Master in Mathematics at TU Berlin. Master's thesis: <i>Highly dense mobile communication networks with random fadings</i> . Supervisor: Prof. Dr. Wolfgang König
July 2016 - March 2019	PhD in Mathematics at TU Berlin. PhD thesis: <i>Message routing and percolation in highly dense multihop networks</i> . Supervisor: Prof. Dr. Wolfgang König. My PhD defence took place on 27.03.2019.

Prizes, scholarships, fellowships

January 2013	Campus Hungary scholarship holder as group leader for a group study visit to the mathematical faculties of Wrocław, Poland (10 students, 5 days)
October 2014 - June 2016	Phase I scholarship holder at the Berlin Mathematical School (BMS)
July 2016 - March 2019	Phase II scholarship holder at the BMS
June 2017 (4 weeks)	Accommodation granted by the local organizers at the PIMS–CRM Probability Summer School in Vancouver, Canada
December 2023	Farkas Gyula Memorial Prize from the János Bolyai Mathematical Society

List of selected scientific talks

April 2015	Presentation at the Hungarian national student research contest at Babeş-Bolyai University, Cluj Napoca, Romania: "The axiom system of classical harmony" (in Hungarian)
March 2018	Talk at the 13th German Probability and Statistics Days in Freiburg: "Routing properties in a Gibbsian model for highly dense multihop networks"
June 2018	Talk at the International Workshop of Applied Probability in Budapest, Hungary: "Routing properties in a Gibbsian model for highly dense multihop networks"
September 2019	Talks on the subject "Invasion and fixation of microbial dormancy traits under competitive pressure": at the workshop "Evolutionary consequences of dormancy" at TU Berlin and at the SPP 1590 Colloquium at the University of Bielefeld
June 2020	Online talk on the subject "SINR percolation and degree bounds" at the Seminar Probability and Geometry of the Ruhr-Universität Bochum
August 2020	Prerecorded talk "Particle systems with coordination" at the Bernoulli-IMS One World Symposium 2020
November 2020	Invited talk "SINR percolation and k -nearest neighbour graphs" at the workshop "Stochastic Geometry and Communications" at WIAS Berlin
December 2020	Online talk on the subject "The interplay of dormancy and transfer in bacterial populations: Invasion, fixation and coexistence regimes" at the Prob-L@B seminar of the University of Bath
April 2021	Online talk "Infection dynamics in the presence of virus-induced dormancy" at the Mathematics Colloquium of the Mathematical Institute of the Serbian Academy of Sciences and Arts

October 2021	Online talk “Host-virus dynamics in the presence of contact-mediated dormancy” at the German Probability and Statistics Days Mannheim
May and June 2022	Talks “Microbial virus epidemics in the presence of contact-mediated host dormancy” and “The wave speed of an FKPP equation with jumps via coordinated branching” at two workshops at HIM Bonn
October 2022	Talk “Interacting Poissonian trajectories and clonal interference” at the SPP 1590 Colloquium at the University of Bielefeld
May 2023	Seminar talk „From clonal interference to interacting Poissonian trajectories (...)” at the seminar Dynamical Systems in Biomathematics at the University of Vienna
December 2023	Talk “Invasion and fixation of microbial dormancy traits in models of stochastic population dynamics” at the workshop “Critical phenomena and challenges emerging from dormancy”, Goethe-Universität Frankfurt

Organization of scientific and collateral activities

Current:

- Reviewer in the following journals: IEEE Transactions on Information Theory, ALEA, Annals of Applied Probability, Stochastic Processes and Their Applications, Electronic Journal of Probability, Applied Probability Trust (Journal of/Advances in Applied Probability).
- Associated member of the DFG SPP 2265 since May 2022
- Member of the János Bolyai Mathematical Society

Former:

- Student representative at the Berlin Mathematical School in 2016
- Jury member of the DMV Student Conference at TU Berlin in July 2016
- Associated member of the RTG 1845 *Stochastic Analysis* from July 2016 until March 2017
- Organizer of the 5th Student Conference of the Berlin Mathematical School in February 2017
- Organizer of the weekly “What is...?” student seminars of the Berlin Mathematical School between 2017 and 2019, in particular of the 10th anniversary of the seminar in June 2018
- Organizer of the bachelor/master thesis contest *Dies Mathematicus 2019* at TU Berlin
- Invitation to the Oberwolfach Workshop ID 2103 “Spatial networks and percolation”, January 2021 (online)
- Committee member of the Center for Junior Scholars of TU Berlin from November 2020 until August 2022
- Organizer of the 3rd BMS–BGSMath workshop in Barcelona, Spain in September 2022
- Postdoctoral faculty member of the Berlin Mathematical School and the MATH+ Berlin Mathematics Research Center between May 2019 and September 2022

List of theses supervised with an official report

1. Tobias Paul: “The Interplay of Dormancy, Horizontal Gene Transfer and Mutation” (Mathematics MSc, TU Berlin, first reviewer: Jochen Blath, second: AT, 2021)

List of courses taught

Lectures:

1. Stochastics for Computer Science \circ (2020, online) \times^* (2023)
2. Stochastic adaptive population dynamics $\diamond!$ (upcoming in summer 2024)

Exercise classes and tutorials (with course assistance, unless stated otherwise):

1. Probabilistic and statistical methods for networks / Spatial stochastic models for telecommunications \diamond (minicourse at a summer school, 2017/assistance at a student seminar, 2018)
2. Stochastics for Computer Science \circ (2019), \times^* (2022), \circ^* (2023)
3. Insurance mathematics \circ (2019/2020)
4. Analysis II for mathematicians \circ (2020/2021, online)
5. Analysis III for mathematicians \circ (2021, online)
6. Probability theory II/Stochastic processes in discrete time \diamond (2021/2022)
7. Measure and integration theory \circ (2022)
8. Algorithm theory $\diamond\times^*$ (2023)
9. Analysis II for engineers $\circ\text{---}$ (2019/2020, 2022)

Notation. Languages of instruction: German (\circ), English (\diamond), Hungarian (\times). Locations: Budapest University of Technology and Economics ($*$), TU Berlin ($.$), Goethe-Universität Frankfurt (!). “ --- ” stands for no course assistance, tutorials only.

Publications and preprints

Published:

1. Wolfgang König and András Tóbiás. A Gibbsian model for message routing in highly dense multihop networks. *ALEA, Lat. Am. J. Probab. Math. Stat.* **16**, 211–258 (2019), see also: *arXiv:1704.03499*.
2. Wolfgang König and András Tóbiás. Routing properties in a Gibbsian model for highly dense multihop networks. *IEEE Transactions on Information Theory*, **65:11** (2019), see also: *arXiv:1801.04985*.
3. András Tóbiás. Signal to interference ratio percolation for Cox point processes, *ALEA, Lat. Am. J. Probab. Math. Stat.* **17**, 273–308 (2020), see also: *arXiv:1808.09857*.
4. Benedikt Jahnel and András Tóbiás. Exponential moments for planar tessellations. *Journal of Statistical Physics* **179**, 90–109 (2020), see also: *arXiv:1902.09857*.
5. Christian Hirsch, Benedikt Jahnel, and András Tóbiás. Lower large deviations for geometric functionals. *Electron. Commun. Probab.* **25**, paper no. 41, 12 pp., see also: *arXiv:1910.05993*.
6. Jochen Blath and András Tóbiás. Invasion and fixation of microbial dormancy traits under competitive pressure. *Stoch. Proc. Their Appl.*, **130:12**, 7363–7395 (2020), see also: *arXiv:1910.13156*.
7. Jochen Blath and András Tóbiás. The interplay of dormancy and transfer in bacterial populations: Invasion, fixation and coexistence regimes. *Theoret. Pop. Biol.*, **139**, 18–49 (2021), see also: *arXiv:2007.02805*.

8. Adrián González Casanova, Noemi Kurt, and András Tóbiás. Particle systems with coordination. *ALEA, Lat. Am. J. Probab. Math. Stat.* **18**, 1817–1844 (2021), see also: *arXiv:2001.05802*.
9. Benedikt Jahnel, András Tóbiás, and Elie Cali. Phase transitions for the Boolean model of continuum percolation for Cox point processes. *Brazilian Journal of Probability and Statistics*, **36:1**, 20–44 (2022), see also: *arXiv:2003.06206*.
10. Benedikt Jahnel and András Tóbiás. SINR percolation for Cox point processes with random powers. *Adv. Appl. Probab.*, **54**, 227–253 (2022), see also: *arXiv:1912.07895*.
11. Benedikt Jahnel and András Tóbiás. Absence of percolation in stationary random graphs with degrees bounded by two. *Random Structures and Algorithms*, **62:1**, 240–255 (2023), see also: *arXiv:2010.03187* (last revised in June 2021).
12. Julio Nava-Trejo, Verónica Miró Pina, Etienne Nzabarushimana, András Tóbiás, Adrián González Casanova, and Inés González Casanova. The role of connectivity on COVID-19 preventive approaches. *PLoS One*, **17:9**, e0273906. <https://doi.org/10.1371/journal.pone.0273906>, see also: (*link to medRxiv*) (last revised in March 2021).
13. Jochen Blath, Tobias Paul, and András Tóbiás. A stochastic adaptive dynamics model for bacterial populations with mutation, dormancy and transfer. *ALEA, Lat. Am. J. Probab. Math. Stat.* **20**, 313–357 (2023), see also: *arXiv:2105.09228* (last revised in January 2023).
14. Jochen Blath and András Tóbiás. Microbial virus epidemics in the presence of contact-mediated host dormancy. *ESAIM: Probability and Statistics*, **27**, 174–220 (2023), see also: *arXiv:2107.11242* (last revised in November 2022).
15. Tommaso Rosati and András Tóbiás. The wave speed of an FKPP equation with jumps via coordinated branching. *Electron. J. Probab.* **28**, 1–29 (2023), see also: *arXiv:2201.08196* (last revised in April 2023).
16. Adrián González Casanova, András Tóbiás, and Daniel Valesin. Scaling limit of an adaptive contact process. *Ann. Probab.* **52:1**, 296–349 (2024), see also: *arXiv:2207.03455* (last revised in June 2023).
17. Jochen Blath, Tobias Paul, András Tóbiás, and Maite Wilke Berenguer. The impact of dormancy on evolutionary branching. To appear in the special issue *Celebrating Alison Etheridge’s contribution to mathematical population genetics* of *Theoretical Population Biology*, **156**, 66–76 (2024) see also: *arXiv:2209.01792* (arXiv version last revised in September 2022).

Submitted:

1. Benedikt Jahnel, Jonas Köppl, Bas Lodewijks, and András Tóbiás. Percolation in lattice k -neighbor graphs. *arXiv:2306.14888* (last revised in June 2023).

Preprint, available online but not yet submitted:

1. Jochen Blath, Anna Kraut, Tobias Paul, and András Tóbiás. A stochastic population model for the impact of cancer cell dormancy on therapy success. *Link to bioRxiv* (last revised in December 2023).

Unpublished:

1. András Tóbiás. The axiom system of classical harmony. *arXiv:1604.02698* (last revised in July 2018).

Published, non-mathematical:

1. László Rétvári and András Tóbiás. Nagyapám is ott volt – Beszélgetés Rétvári Lászlóval a forradalomról (My grandfather was also there – A discussion with Rétvári László about the revolution [of 1956 in Hungary]).
In: Szónoky-Pál-Karancsi: *A határok kutatója* (The researcher of borders – A book devoted to Ágnes Pál on the occasion of her 65th birthday), Magyarságkutató Tudományos Társaság, Szeged-Szabadka, 2007, pp. 28-37.