

CURRICULUM VITAE

Personal Information

Family name, First name: **KELEMEN SZABOLCS**

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Education

- 2020-present **PhD** – Faculty of Physics, Institute for Doctoral Studies, Doctoral School of Physics, Babeş-Bolyai University, Romania
Main topic: Applications of the Local Growth and Global Reset (LGGR) model for socio-economic and biological problems.
PhD Supervisors: Prof. Dr. Zoltán Néda
- 2018-2020 **MSc** – Faculty of Physics, Babeş-Bolyai University, Romania
Specialisation: Computational Physics (average grade: 10.00/10), merit scholarship
- 2014-2018 **BSc** – Faculty of Physics, Babeş-Bolyai University, Romania
Specialisation: Physics Engineering (average grade: 9.85/10)

Work experience

- 07.08.2023-present *assistant researcher* within research project PNNR A better understanding of socio-economic systems using quantitative methods from Physics, CF nr. 760034 (Director: Prof. Dr. Marcel Ausloos), Faculty of Physics, Babeş-Bolyai University, Romania
- 03.03.2021-present *assistant researcher* within research project UEFISCDI PN-III-P4-ID-PCE-2020-0647, Applications of statistical physics and thermodynamics for modelling phenomena in social and economic systems (Director: Prof. Dr. Zoltán Néda), Faculty of Physics, Babeş-Bolyai University, Romania
- 20.07.2020-26.05.2023 *software developer* at ARRK Research & Development Ltd., Romania

Scholarships and Awards

- 2020-present *Talent management scholarship* – offered through the Collegium Talentum Programme of Hungary (scholarship program supporting the professional development of young Hungarians and advancing their intellectual careers), administrated by the 'Fundatia Sapientia' organisation, funded by contributions from the Bethlen Gábor State Fund.
- 2019-2020 Five months Erasmus+ Trainee scholarship at the IFTO (Institut für Festkörpertheorie und Optik) research institute, Friedrich Schiller University in Jena, Germany
- 2018-2019 *Special scholarship for scientific activity* – STAR-UBB Institute, Babeş-Bolyai University, Romania
- 2019 Special award at the 34th National Scientific Students' Associations Conference (OTDK), in Statistical Physics section (oral presentation)

Conferences and seminars

- 17.11.2023-18.11.2023 Szabolcs Kelemen, István Gere, Tamás S. Biró and Zoltán Néda. A brief review of the LGGR model and its possible applications. [Oral presentation]. ICAS 2023: The 16th International Conference on Applied Statistics
- 10.07.2023-14.07.2023 Szabolcs Kelemen, Máté Józsa, József Benedek Cristian Litan and Zoltán Néda. Handling incomplete information: Gini coefficient from coarse-grained data. [Poster presentation]. SigmaPhi 2023
- 22.05.2023-26.05.2023 Szabolcs Kelemen, Máté Józsa, Tibor Hartel, György Csóka and Zoltán Néda. Tree size distribution in the perspective of the Local Growth and Global Reset (LGGR) model. [Poster presentation]. MECO48: 48th Conference of the Middle European Cooperation in Statistical Physics
- 24.08.2022-26.08.2022 István Gere, Szabolcs Kelemen, Tamás S. Biró and Zoltán Néda. Wealth inequality patterns based on exhaustive sampling. Data mining and modelling. [Oral presentation]. Econophysics Colloquium 2022
- 12.06.2022-16.06.2022 István Gere, Szabolcs Kelemen, Tamás S. Biró and Zoltán Néda. Wealth inequalities in different socio-economical situations. Exhaustive data and a general modelling framework. [Poster presentation]. MECO47: 47th Conference of the Middle European Cooperation in Statistical Physics
- 11.05.2021-13.05.2021 Szabolcs Kelemen, Levente Varga, and Zoltán Néda. Cross-correlations in the Brownian motion of colloidal nanoparticles [Poster presentation]. MECO46: 46th Conference of the Middle European Cooperation in Statistical Physics
- 23.04.2019-26.04.2019 34th National Scientific Students' Associations Conference (OTDK), in Statistical Physics section [oral presentation]

Publications

- 2024 István Gere, Szabolcs Kelemen, Zoltán Néda and Tamás S. Biró. Jackpot statistics, a physicist's approach. *Physica A: Statistical Mechanics and its Applications* - Manuscript under first revision
- 2024 Szabolcs Kelemen, Máté Józsa, Tibor Hartel, György Csóka and Zoltán Néda. Tree size distribution as the stationary limit of an evolutionary master equation. *Scientific Reports*, Vol. 14, 1168, (2024)
- 2022 István Gere, Szabolcs Kelemen, Tamás S. Biró and Zoltán Néda. Wealth Distribution in Villages. Transition From Socialism to Capitalism in View of Exhaustive Wealth Data and a Master Equation Approach. *Frontiers in Physics*, Vol. 10, 827143, (2022)
- 2021 István Gere, Szabolcs Kelemen, Géza Tóth, Tamás S. Biró, and Zoltán Néda. Wealth distribution in modern societies: Collected data and a master equation approach. *Physica A: Statistical Mechanics and its Applications*, Vol. 581, 126194, (2021)
- 2020 Szabolcs Kelemen, Levente Varga, and Zoltán Néda. Cross-correlations in the Brownian motion of colloidal nanoparticles. *Studia Universitatis Babes-Bolyai, Physica* Vol. 65 (2020)

Job related skills

Proper knowledge in: theoretical and computational physics with *competences in:* statistical mechanics, thermodynamics, complex systems, agent-based models, master equation framework for modeling Markov processes, Monte-Carlo numerical simulations. Further *competences in:* data mining and data analysis

Computer and computational skills: LaTeX, Microsoft Office

Known programming languages: advanced knowledge of Python, intermediate user of C, C++, Wolfram Mathematica and familiar with Java and Matlab.

Good organizational and teamwork skills, good time management. Good communication abilities and relationship-building skills.

Language skills

Mother tongue: Hungarian; proficient user (C2) in Romanian and (C1) in English, independent user (B1) in German.

2023.11.10. Cluj-Napoca, Romania