

# MARCELL NAGY

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## EDUCATION

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**Budapest University of Technology and Economics, Budapest, Hungary**  
**Doctoral School of Mathematics and Computer Science** *2019 - Present*  
PhD in Applied Mathematics

- Research topic: *Data-driven methods of complex networks*
- Supervisors: Károly Simon, Roland Molontay

**Budapest University of Technology and Economics, Budapest, Hungary** *2016 - 2018*  
MSc in Applied Mathematics, Specialized in Stochastics

- Master's thesis:  
*Data-Driven Analysis of Fractality and Other Characteristics of Complex Networks*  
Supervisors: Károly Simon, Roland Molontay
- Qualification of diploma: with highest honors (DGPA = 4.87/5)

**Budapest University of Technology and Economics, Budapest, Hungary** *2013 - 2016*  
BSc in Applied Mathematics

- Bachelor's thesis: *Fractal Networks and Assortativity*

## WORK & RESEARCH EXPERIENCE

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**Research assistant** – University of Debrecen (HU-MATHS-IN) *Sep 2018 - Present*  
Research topic: Data-driven analysis of complex networks

**Research assistant** – BME–Central Academic Office *Jul 2018 - Present*  
Research topic: Educational data science

**Young researcher** – Higher Education Institutional Excellence Program (FIKP) *Jul 2018- Present*  
Research topic: Artificial intelligence

**Deputy coordinator** – BME – Statistics Consulting Group *Dec 2017 - Present*  
We offer statistical consulting and provide data science research and development service to our corporate and academic partners.

**Research assistant** – MTA-BME Stochastics Research Group *Dec 2017 - Aug 2019*  
Research topic: Data-driven network science and fractal networks

**Developer** – Institute for Computer Science and Control *Jul 2017 - Oct 2017*  
Research topic: Machine learning, time series, and system identification

## TEACHING EXPERIENCE

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**Laboratory instructor**

- Statistics I. – Budapest University of Technology and Economics (BME) *Spring 2020*  
Excel & R Studio (hypothesis testing, correlation and regression analysis)

- Data Analytics (in English)– BME *Spring 2020*  
RapidMiner & Tableau
- Applied Stochastics (in English) – BME *Fall 2019*  
Python simulations (network models, random walks, queueing theory, percolation)

### Teaching assistant

- Data Science (in English) – Aquincum Institute of Technology (AIT-Budapest) *2019 - Present*  
Assistance in recitation classes and evaluating projects
- Introduction to Data Science I. – BME *Fall 2017, 2018, 2019*  
Data visualization tutorial classes using Tableau  
Grader, and student project supervisor
- Analysis 2 – BME *Spring 2017*  
Homework grading

### Assistant supervisor

- Individual research project of Bachelor and Master students at BME *2018 - Present*  
Topic: Educational data science
- Summer internship of a Master student from INSAE, Paris *Summer 2019*  
Topic: Data science and network science
- Summer internship of Bachelor students from the UK *Summer 2018*  
Topic: Educational data science and network science
- BSc Thesis: *Analysis of Co-Authorship Network of Network Scientists* *Fall 2018*

## CONFERENCES & SCHOOLS

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NetSci-X 2020 International Conference and School on Network Science, Tokyo, Japan *January 2020*  
Title of poster: *Comparing Box-Covering Algorithms for Fractal Dimension of Complex Networks*

The 47th European Society of Engineering Education (SEFI) Annual Conference, *September 2019*  
Budapest, Hungary

The 2019 IEEE/ACM International Conference on Advances in Social Networks *August 2019*  
Analysis and Mining, Vancouver, Canada  
Title of presentation: *On the Structural Properties of Social Networks and their Measurement-calibrated Synthetic Counterparts*

1st Conference on Transfer between Mathematics & Industry, *July 2019*  
Santiago de Compostela, Spain  
Title of poster: *Machine Learning Algorithms for Predicting Academic Performance and Identifying the Contributing Factors*

7th International Conference on Complex Networks and their Applications, *December 2018*  
Cambridge, UK

2nd Danube Conference for Higher Education Management, Budapest *November 2018*  
Title of presentation: *Predictive Power of Admission Point Score and its Variants on Academic Performance*

## PUBLICATIONS

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1. Molontay, R., & Nagy, M. (2020). *Twenty Years of Network Science: A Bibliographic and Co-authorship Network Analysis*. Lecture Notes in Social Networks, Springer.  
(Accepted)
2. Kiss, B., Nagy, M., Molontay, R., & Csabay, B. (2019). *Predicting Dropout Using High School and First-semester Academic Achievement Measures*. In Proceedings of the 17th International Conference on Emerging eLearning Technologies and Applications, IEEE.
3. Nagy, M., Molontay, R., & Szabó, M. (2019). *A web Application for Predicting Academic Performance and Identifying the Contributing Factors*. In Proceedings of The 47th SEFI Annual Conference, pp. 1794-1806.
4. Molontay, R., & Nagy, M. (2019). *Two Decades of Network Science: as seen through the co-authorship network of network scientists*. In Proceedings of The 2019 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, pp. 584-588.
5. Nagy, M., & Molontay, R. (2019). *On the structural properties of social networks and their measurement-calibrated synthetic counterparts*. In Proceedings of the 2019 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, pp. 584-588.
6. Nagy, M., & Molontay, R. (2018). *Predicting Dropout in Higher Education based on Secondary School Performance*. In Proceedings of the 22nd International Conference on Intelligent Engineering Systems, pp. 389-394, IEEE.
7. Nagy, M., & Molontay, R. *Data-driven Analysis of Complex Networks and their Model-Generated Counterparts*. Physica A  
(Under revision)
8. Nagy, M., & Molontay, R. *Comprehensive Analysis of the Predictive Validity of University Entrance Scores in Hungary*.  
(Under revision)

## RELATED SKILLS

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| <b>Programming languages</b>    | Python, R, Wolfram Language, MATLAB, SQL  |
| <b>Network science packages</b> | networkx, graph-tool, igraph, PyGraphistry  |
| <b>Network science tools</b>    | Gephi, Cytoscape, VOSviewer   |
| <b>Data science packages</b>    | sklearn, pandas, seaborn, matplotlib, numpy, statsmodels, tensorflow                |
| <b>Data science tools</b>       | Tableau (Desktop, Data Prep), RapidMiner  |
| <b>Foreign languages</b>        | English (full professional working proficiency),<br>German (elementary proficiency) |