

Ian Leifer

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PhD candidate in complex networks. Experienced in working with biological data on every level from scraping and wrangling to analysis and visualization. Seeking a data scientist position in the wellness industry, which will allow me to apply my skills of data analysis and communication while being of service to society.

EDUCATION

PhD Physics (Complex networks)

Fall 2016-present

The Graduate Center, City University of New York (New York, NY)

Scientific Advisor: Dr. Hernan Makse.

Thesis: "Symmetry-inspired analysis of biological networks".

- Analyzed biological data to gain insight into how biological networks function.
- Created and led a highly cross-disciplinary collaboration between multiple research groups.

Project: Analyzed biological data to uncover functional building blocks of directed networks.

- Scraped more than 450 networks across 37 databases and wrangled them into the same format.
- Designed a R package with C insertions implementing a mathematically formulated algorithm.
- Parallelized the R package above to analyze data on 100,000 networks.
- Developed a framework visualizing outputs based on the analysis of over 450 networks up to 30,000 nodes.

Project: Performed statistical analysis of biological data to prove graph theoretical hypothesis.

- Formulated and applied a statistical hypothesis testing framework to look for cross-correlations in the subsets of data based on 4000 signals measured 1500 times.
- Developed a framework to visualize the cross-correlation data on 4000 signals.

Project: Created optimization models for symmetry-driven repairs of graphs.

- Using the API scraped 170,000 data files and compiled them into a few interpretable datasets.
- Built an optimization model aimed at repairing graphs with missing edges.
- Developed a framework to visualize an abstract mathematical concept of the automorphism group to interpret outputs of the optimization model.

MSc Solid State Physics

Fall 2014-Spring 2016

VSHOPF UNN (Nizhny Novgorod, Russia)

BSc Physics

Fall 2010-Spring 2014

VSHOPF UNN (Nizhny Novgorod, Russia)

PROFESSIONAL EXPERIENCE

Teaching Assistant

Sep 2017-present

City College of New York and Graduate Center CUNY

Teaching physics labs for undergraduate students

- Was an instructor in a pilot innovative physics teaching program using education research-based materials.
- Designed a semi-automated grading software improving objectivity and doubling the speed.
- Taught a workshop for PhD students "Introduction to Git".
- Presented a workshop for PhD students "Introduction to R for Network Analysis. Symmetries in networks".

Software Engineer C/C++

Aug 2013-Apr 2015

MERA. Software Services Company. Nizhny Novgorod, Russia.

Developing the driver for Radio Base Stations.

- Implemented the support of IPv6 by our driver as a part of an agile team.
- Uncovered a major issue in the testing process and implemented a project to fix it.
- Led a team of 3 people for 3 months successfully implementing the project improving the testing process.

Software Engineering Intern C/C++

Summer 2013

MERA. Software Services Company. Nizhny Novgorod, Russia.

PUBLICATIONS

6. *Higor S. Monteiro, Ian Leifer, Saulo D. S. Reis, José S. Andrade Jr., and Hernán A. Makse*. Efficient algorithmic paradigm to identify partial synchrony in information-processing networks using graph fibrations. Under review **Chaos**, 2021.
5. *Ian Leifer, Mishaél Sánchez, Cecilia Ishida, Hernán A. Makse*. Predicting synchronized gene coexpression patterns from fibration symmetries in gene regulatory networks in bacteria. In press **BMC Bioinformatics**, 2021.
4. *Ian Leifer, Flaviano Morone, Saulo D. S. Reis, José S. Andrade Jr., Mariano Sigman, Hernán A. Makse*. Circuits with broken fibration symmetries perform core logic computations in biological networks. **PLoS Comput Biol**, 2020.
3. *Flaviano Morone, Ian Leifer, Hernán A. Makse*. Fibration symmetries uncover the building blocks of biological networks. **PNAS USA**, 2020.
2. *Ian Leifer, Lev Leifer*. Small business valuation with use of cash flow stochastic modeling. **Proceedings of SMRLO'16**, 2016.
1. *Ian Leifer, Lev Leifer*. Investigation of investments in foreign real estate effectiveness. **Proceedings of scientific-practical conference for high-schools**, 2009.

4 publications in preparation to come up in 2021.

TALKS AND AWARDS

- **Award:** Doctoral Student Research Grant (Round 15, 2020).
- **Invited talk:** "Symmetry-inspired building blocks perform core logic computations in directed networks". DynaMo, a satellite meeting at Networks 2021.
- "Fibration symmetries uncover the building blocks of biological networks". APS March meeting 2021.
- "Fibration symmetries uncover the building blocks of biological networks". Complex2020.
- "Fibration symmetries uncover the building blocks that perform core logic computations in biological networks". Synthetic Biology Approaches to Improve Human and Environmental Health.
- "Small Business Valuation with Use of Cash Flow Stochastic Modeling". SMRLO'16.
- "Development of statistical models for simulation of natural disasters on example of forest fires". Intel ISEF 2009 (local chapter).

SKILLS

<i>Programming languages</i>	R (Advanced), C/C++ (Advanced), Bash (Intermediate) Matlab (Intermediate), Perl (Intermediate)
<i>Human languages</i>	Russian (fluent), English (fluent)
<i>Software development</i>	Linux , tidyverse , Rcpp , igraph , Git , Agile Methodologies TCP/IP stack, Selenium, Inkscape, Keras, Beautiful Soup

OTHER ACTIVITIES

- Played on Ultimate Frisbee college team.
- Underwent air force officer training.
- Other interests include hiking, yoga, mental and physical wellness and spirituality.