

# Zsolt Pajor-Gyulai

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## Professional summary

Mathematician, Data Scientist, ML Researcher. Enthusiast for anything Math, Statistics, Computer Science, and ML/AI. Currently developing automated trading systems in the hedge fund space.

## Professional experience

- 2018-present **Member of the Research Staff, Level 2, The Voleon Group.**  
Applying state-of-the-art machine learning techniques to develop predictive models for financial markets. Developing, evaluating, and maintaining various components of automated trading systems from data cleaning through forecasting to portfolio formation including on-call rotation debugging live systems. Scrum master for two years.
- 2015-2018 **Courant Instructor/Assistant Professor in Mathematics, New York University.**  
Studied the long time behavior of diffusions along a heteroclinic networks, which are collections of hyperbolic saddle points and heteroclinic orbits connecting them. Heteroclinic networks are common in different contexts ranging from population dynamics to the modeling of neural processes. Taught various courses in mathematics to undergraduate and graduate students.
- 2010-2015 **Brin Graduate Fellow, University of Maryland, College Park.**  
Studied macroscopic transport properties of periodic, incompressible, planar cellular flows on intermediate time scales. Established a fractional kinetic effective process whose variance grows as the square root of the elapsed time. This growth turns smoothly into the homogenized linear one for time scales that grow faster than the inverse of the noise intensity. Served as teaching assistant to numerous undergraduate and graduate courses.

## Education

- 2010-2015 **Ph.D. in Mathematics, University of Maryland College Park.**  
Thesis title: Averaging and homogenization in cellular flows  
Advisor: Dr. Leonid Korolov
- 2004-2010 **B.Sc. and M.Sc. in Physics, Budapest University of Technology and Economics,**  
Diploma with highest honors.  
Thesis title: Energy Transfer and Joint Diffusion

## Continuing education

- Audited **New York University.**  
courses: Introduction to Data Science, Machine Learning and Computational Statistics, Deep Learning, Mathematics of Deep Learning with Parallel Curriculum on Reinforcement Learning, CPAC I, Accelerated introduction to computer science with Java.

## Programming experience

- Languages Extensive enterprise level experience with Python, R and their respective data science ecosystems. Hobby level experience with C/C++. Familiarity with Java and Matlab.
- Tools Unix CLI, VScode, Emacs, Vim

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## Projects

2017 **Population estimation based on satellite imagery.**

Project to build models predicting population density based on satellite imagery by comparing spatially disaggregated census data on the continental United States to satellite images of the particular region. Approaches used: (1) one versus all logistic regression on the vectorized satellite images; (2) convolutional neural network built from scratch; (3) pre-trained network developed for image recognition.

GitHub: [www.github.com/Moosquibe](http://www.github.com/Moosquibe)

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## Talks (Selected)

2017 **Fractional kinetic process describing the intermediate time behavior of cellular flows**, *Minisymposium on Random Walks and Anomalous Transport, SIAM Conference on Applications of Dynamical Systems*, Snowbird, Utah.

2016 **Stochastic approach to anomalous diffusion in incompressible two dimensional cellular flows**, *Hyperbolic Dynamics and Statistical Physics*, Erwin Schroedinger International Institute for Mathematics and Physics, Vienna.

2015 **On dynamical systems perturbed by a diffusion driven by a null recurrent fast motion**, *1107th AMS Meeting*, Georgetown University, Washington DC.

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## Publications (Selected)

2018 Y. Bakhtin, Zs. Pajor-Gyulai *Malliavin calculus approach to long exit times from an unstable equilibrium on the line* **Annals of Applied Probability**

2018 M. Hairer, G. Iyer, L. Korolov, A. Novikov, Zs. Pajor-Gyulai *A fractional kinetic process describing the intermediate time behaviour of cellular flows* **Annals of Probability**

2017 Zs. Pajor-Gyulai, M. Salins *On dynamical systems perturbation by a null-recurrent fast motion: The general case* **Stochastic Processes and their Applications**

2016 M. Hairer, Zs. Pajor-Gyulai, L. Korolov *From averaging to homogenization in cellular flows - An exact description of the transition* **Annales de l'Institut Henri Poincaré, Probabilités et Statistiques**

All publications available at:

[https://arxiv.org/find/math/1/au:+Pajor\\_Gyulai\\_Z/0/1/0/all/0/1](https://arxiv.org/find/math/1/au:+Pajor_Gyulai_Z/0/1/0/all/0/1)

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## Interests and Hobbies

When I am not learning some new technology, I like to climb rocks, bike, hike, and in general travel all over the world.

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## Miscellaneous

Citizenship Hungarian

US status Permanent resident of the United States

Speaks: Hungarian (native), English