



JEREMI K. OCHAB

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SUMMARY

A theoretical physicist by training, with background in linguistics, interdisciplinary experience, and data science mind-set. Using *Mathematica* for rapid idea development, and collaborating in *Matlab* (with neuroscientists) and *R* (with linguists). Currently, an assistant professor at Jagiellonian University in Cracow, Poland, with his EEG lab.

RESEARCH EXPERIENCE

- 2018 – present Department of Theory of Complex Systems, Jagiellonian University:
Assistant professor (tenure-track position)
- 2016 – 2019 **PI** of a project Sonata funded by Polish National Science Centre
▶ **Fluctuation analysis** and **machine learning** for human EEG
- 2015 – 2016 Post-doc in *Interdisciplinary applications of Random Matrix Theory*
▶ **Time series analysis** in EEG and actigraphy data in humans
- 2013 – present Engaged in Computational Stylistics Group research
▶ **Authorship attribution** and style quantification in literature
- 2014 – 2016 **PI** of a project Preludium funded by Polish National Science Centre
▶ **Community detection in complex networks**
- 2009 – 2013 Ph.D. thesis, Dpt. of Theory of Complex Systems, JU
▶ maximal-entropy **random walk** and **clustering** of complex networks (analytical solutions, simulations, algorithm development)
- 2008/2009 M.Sc. thesis, Dpt. of Statistical Physics, JU
▶ synchronization in Kuramoto model of coupled oscillators (simulated ODEs in C, analytical solution of 1D model)
- 2004 – 2006 Student projects, Institute of Physics, JU
▶ agent based simulations and analytical study of epidemic spread on static and dynamic small-world networks

INTERNSHIPS

- 2019, 2 months Centre for Multidisciplinary Studies in Complex Systems and Neuroscience, UNSAM, Buenos Aires, Argentina
- 2018, 2 months ▶ long-term collaboration on modelling and analysis of brain and other critical systems (mainly fMRI data analysed in MATLAB)
- 2009-2013, 11 months Institute of Theoretical Physics, Leipzig University, Germany
▶ model of **mass condensation** on networks (Monte Carlo simulations in C, extension of analytical solutions)
- 2007, 2 months DESY-Zeuthen, Germany:
▶ Summer Student Program, reconstructing air showers in IceTop exp.

EDUCATION

	<u>Jagiellonian University, Cracow</u>
2009 – 2013	Ph.D. in physics cum laude
2005 – 2014	M.A. in Polish-English translation (3-year B.A., 2-year M.A. programme)
2004 – 2009	M.Sc. in theoretical physics cum laude (5-year Joint Honours Programme)

SCHOLARSHIPS

2013	The scholarship for outstanding achievements by the Polish Ministry of Science and Higher Education.
2009 – 2013	Foundation for Polish Science: <i>International PhD Projects Programme</i>
2005, 2007	Jagiellonian University, graduate fellowship

COMPUTER SKILLS

- ▶ advanced in *Mathematica*
- ▶ basics (2-3 years) of *Matlab*, *R*
- ▶ rudimentary Python, C/C++ and Bash scripting

LANGUAGE SKILLS

English	proficient (M.A. in English philology and translation)
German	basics
Polish	native

ORGANIZATION

Cracow, 2019	<i>Random Matrix Theory: Applications in the Information Era</i>
Cracow, 2014	<i>Random Matrix Theory: Foundations and Applications</i>
Cracow, 2010	<i>23rd Marian Smoluchowski Symposium on Statistical Physics: Random Matrices, Statistical Physics and Information Theory</i>

ADDITIONAL INFORMATION

Teaching experience	<ul style="list-style-type: none">▶ Statistical Field Theory (1st y. graduate students of theoretical physics)▶ Discrete Mathematics (undergrad students of applied computer science)▶ Stylometry (European Summer School in Digital Humanities, 2015, 2017, 2018)
Interests	Translation (translated five popular-science books), table tennis (in the university Sports Association), dance

SELECTED PUBLICATIONS

1. **J.K. Ochab**, K. Gerc, H. Ogińska, M. Fąfrowicz, E. Gudowska-Nowak, T. Marek, M.A. Nowak, K. Oleś, J. Szwed, D.R. Chialvo, *Classifying attention deficit hyperactivity disorder in children with non-linearities in actigraphy* (submitted, 2019).
2. M. B. Bachli, L. Sedeño, **J. K. Ochab**, O. Piguet, F. Kumfor, P. Reyes, T. Torralva, M. Roca, D. Matallana, F. Manes, A. M. García, A. Ibanez, D. R. Chialvo, *Evaluating neurocognitive biomarkers reliability of neurodegenerative diseases across countries: a machine learning approach* (submitted to NeuroImage, 2019).
3. E. Gudowska-Nowak, M.A. Nowak, D.R. Chialvo, **J.K. Ochab**, W. Tarnowski, *From synaptic interactions to collective dynamics in random neuronal networks models: critical role of eigenvectors and transient behaviour*, [arXiv:1805.03592](https://arxiv.org/abs/1805.03592) [q-bio.NC] (accepted to *Neural Computation*, 2019).
4. **J.K. Ochab**, W. Tarnowski, M.A. Nowak, D.R. Chialvo, *On the pros and cons of using temporal derivatives to assess brain functional connectivity*, [NeuroImage 184, 577-585 \(2019\)](https://doi.org/10.1006/neuroimage.2019.184.577-585).
5. G. Franzini, M. Kestemont, G. Rotari, M. Jander, **J.K. Ochab**, E. Franzini, J. Byszuk, J. Rybicki, *Attributing authorship in the noisy digitized correspondence of Jacob and Wilhelm Grimm*, [Front. Digit. Humanit. 5:4 \(2018\)](https://doi.org/10.1016/j.fdh.2018.05.001).
6. **J.K. Ochab**, *Reinventing the Triangles: Rule of Thumb for Assessing Detectability*, IEEE/Signal-Image Technology & Internet-Based Systems (SITIS), 2015 11th International Conference on. [IEEE Computer Society; DOI:10.1109/SITIS.2015.44](https://doi.org/10.1109/SITIS.2015.44).
7. **J.K. Ochab**, *Stylometric networks and fake authorships*, [Leonardo 50, 502 \(2017\)](https://doi.org/10.1016/j.leonardo.2017.03.001).
8. **J.K. Ochab**, H. Nagel, W. Janke, B. Waclaw, *A simple non-equilibrium, statistical-physics toy model of thin-film growth*, [J. Stat. Mech., P09013 \(2015\)](https://doi.org/10.1088/1742-5473/2015/01/P09013).
9. **J.K. Ochab**, J. Tyburczyk, et. al, *Scale-free fluctuations in behavioral performance: Delineating changes in spontaneous behavior of humans with induced sleep deficiency*, [PLoS One, e107542 \(2014\)](https://doi.org/10.1371/journal.pone.0107542).
10. **J.K. Ochab**, Z. Burda, *Maximal entropy random walk in community detection*, [Eur. Phys. J-Spec. Top. 216, 73-81 \(2013\)](https://doi.org/10.1088/1475-2875/2013/01/021).
11. **J.K. Ochab**, Z. Burda, *Exact solution for statics and dynamics of Maximal Entropy Random Walk on Cayley trees*, [Phys. Rev. E 85, 021145 \(2012\)](https://doi.org/10.1103/PhysRevE.85.021145); DOI:[10.1103/PhysRevE.85.021145](https://doi.org/10.1103/PhysRevE.85.021145).