Nicolas Perony

Professional experience (full details on LinkedIn profile)

08.2016-present **Team Lead Data Science & AI**, *Hyperloop Transportation Technologies (remote)*.

08.2015-08.2016 **Data Scientist**, *Hyperloop Transportation Technologies, Los Angeles (remote)*.

12.2015-present **Co-Founder**, *NGO Slow Motion Projects, Zurich*.

02.2015-03.2016 **Data Scientist**, *Tamedia Digital, Zurich*.

07.2014-present **Co-Founder, Head of Research & Analytics**, *ECUREX, Zurich*.

01.2014-01.2015 **Lecturer** (*Dozent*), *ETH Zurich, Department of Management, Technology and Economics*.

12.2014-01.2015 **Guest researcher**, *Wissenschaftskolleg zu Berlin; Indiana & Greifswald Universities*.

04.2012-12.2014 **Postdoctoral research associate**, *ETH Zurich, Chair of Systems Design*.

04.2012-11.2013 **Postdoctoral research associate**, *University of Zurich (external affiliation)*.

Education

2008–2012 **Ph.D.,** Complex Systems & Data Mining, *ETH Zurich*, Switzerland.
Topic: *Comparative analysis of social interactions in animal groups*. Supervisor: Prof. Frank Schweitzer. Thesis awarded the ETH medal in January 2013.

2003–2008 **B.Eng. and M.Eng./M.Sc.**, *INSA Toulouse*, France.
Degree in Electrical Engineering, specialised in Electronics & Embedded Systems. M.Sc. project at the University of Zurich (with Prof. Marta Manser). Final grade: 17/20 (US A equivalent).

2003 **Baccalauréat**, *Toulon*, France.
Scientific Series, specialised in Mathematics. Final grade: *Très bien (Highest Honours)*.

Interests & skills

Research interests **Data Mining & Pattern recognition:** Automatic extraction of knowledge from large, unstructured data sets; (Un)Supervised learning models for classification and prediction; Natural language processing; Statistical hypothesis testing and frequentist inference.

Social complexity & Collective behaviour: Structure and dynamics of interaction in complex societies; Agent-based modelling of collective social dynamics; Social network analysis and pattern characterisation; Collective intelligence and group decision making.

Business skills Team player and leader, able to supervise and coach employees, independently lead projects, organise and conduct meetings & discussions, clearly present results and distil complex notions, address large audiences, write proposals and management reports.

Scientific skills Processing and mining of large data sets, machine learning, natural language processing, network analysis, agent-based simulations, stochastic modelling.

Technical skills Management and operation of UNIX systems, locally and in the cloud (AWS, Azure). Tools & programming paradigms: Python (Numpy/SciPy, scikit-learn, GraphLab), MATLAB, Bash, SQL, Mathematica, R, Java, LaTeX.

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Selected awards & grants

2016 Tamedia Data Analytics Excellency Award, honorary prize given by the CTO.

2015 Grant of the Swiss National Science Foundation for Interdisciplinary Research, with K. Aminian (EPF Lausanne) and A. Ozgul (University of Zurich): CHF 700'000 (declined).

2014 Popular science talk "The secret social lives of bats" selected as TED talk of the day.

2013 ETH Zurich medal awarded for doctoral thesis. CHF 1'500 cash prize.

2012 Grant of the Swiss National Science Foundation for Interdisciplinary Research, with F. Schweitzer (ETH Zurich) and B. König (University of Zurich): CHF 492'111.

2010 2nd best paper award at ECCS'10 (European Conference on Complex Systems), for the paper *A stochastic model of social interaction in wild house mice*. EUR 200 cash prize.

2008 Master thesis selected among the 10 best (out of 400) at INSA Toulouse, for the work *GPS tracking and heart rate monitoring in meerkats: a technical approach*.

Teaching experience

Spring 2016-Spring 2017 **Data Science for Sustainable Development**, *Slow Motion Projects*, Lecturer, Various courses & workshops (on Data Science, Machine Learning, AI) in China/India/Bhutan.

Autumn 2015 **Bitcoin: Evolution or Revolution?**, *Zurich University of Applied Sciences in Business Administration (HWZ)*, Lecturer, CAS Disruptive Technologies.

Spring 2014 **Agent-Based Modelling of Social Systems**, *ETH Zurich*, Lecturer, Department of Management, Technology and Economics.

Spring 2014 **Animal Behaviour Literature Seminar**, *University of Zurich*, Lecturer & coordinator, Institute of Evolutionary Biology and Environmental Studies.

Spring 2010 **Complex Adaptive Systems**, *ETH Zurich*, Teaching assistant, Department of Management, Technology and Economics.

Academic activities

Reviewer for Institutions: *German Research Foundation*, *Springer*; Journals: *PLOS Computational Biology*, *Proceedings of the Royal Society B*, *Journal of the Royal Society Interface*, *PLOS ONE*, *Animal Behaviour*, *Behavioral Ecology and Sociobiology*, *Ethology*, *Ecological Modelling*; Conferences: *ECCS*, *ICAART*, *SocialSimulation*.

Organiser Conference "Peer-to-Peer Financial Systems", Deutsche Bundesbank, Jan. 29-30, 2015.

Workshop "Quantitative Analysis of Collective Behaviour: From the Lab to the Wild", 2014 Conference of the Animal Behavior Society, Princeton NJ, USA.

Outreach activities

2016-2017 Volunteering work on science-based environmental education projects covering sustainability, conservation, and data science in developing regions of Asia.

2013-2015 Invited popular science talks on complexity and data science at TEDxZurich and TEDxGateway (Mumbai), one featured in the TED.com collection. Over 1M combined views.

2010-present Work covered in public media such as BBC, ScienceNOW, Discovery News, Smithsonian Magazine, New Scientist, ABC Science, MSNBC, ScienceNews, The Daily Mail...

Various interviews for public radio and popular science programmes.

Detailed list at `http://www.sg.ethz.ch/team/people/nperony/inthemedia`.

Personal information

Personal details French citizen (Swiss C permit). Born on November 22, 1986 (30 years old). Unmarried.

Languages English (fluent), French (native), German (proficient/C1), Italian (conversational).

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Publications & Talks

Scientific talks

2008-present Over 50 invited lectures, seminars and conference presentations.
Detailed list at `www.sg.ethz.ch/team/people/nperony/talks`.

Publications

Books & book chapters

[16] Tomaso Aste, Loriana Pelizzon, Paolo Tasca, and Nicolas Perony, editors. *Banking Beyond Banks and Money*. Springer, 2016.

[15] Cédric Sueur, Sebastian Sosa, and Nicolas Perony. De l'utilité de l'analyse des réseaux sociaux dans l'étude du comportement animal. In Cédric Sueur, editor, *Analyse des réseaux sociaux appliquée à l'éthologie et l'écologie*, chapter 1, pages 21–48. Editions Matériologiques, Paris, 2015.

[14] Nicolas Perony, Cédric Sueur, and Gerald Kerth. La socialité complexe des chauves-souris. In Cédric Sueur, editor, *Analyse des réseaux sociaux appliquée à l'éthologie et l'écologie*, chapter 7, pages 205–232. Editions Matériologiques, Paris, 2015.

[13] Cédric Sueur, Nicolas Perony, Frédéric Amblard, and Jean-Loup Guillaume. Modélisation des réseaux sociaux. In Cédric Sueur, editor, *Analyse des réseaux sociaux appliquée à l'éthologie et l'écologie*, chapter 15, pages 423–444. Editions Matériologiques, Paris, 2015.

Forthcoming papers

[12] Thomas O. Richardson*, Nicolas Perony*, Claudio J. Tessone, Christophe A.H. Bousquet, Marta B. Manser, and Frank Schweitzer. A framework for extracting pairwise coupling information during collective animal motion. Submitted (arXiv preprint: 1311.1417), 2014.

Peer-reviewed journal articles

[11] David Garcia, Claudio J. Tessone, Pavlin Mavrodiev, and Nicolas Perony. The digital traces of bubbles: Feedback cycles between socio-economic signals in the Bitcoin economy. *Journal of the Royal Society Interface*, 11(99):20140623, 2014.

[10] Yannick Auclair, Barbara Koenig, Manuela Ferrari, Nicolas Perony, and Anna K. Lindholm. Nest attendance of lactating females in a wild house mouse population: Benefits associated with communal nesting. *Animal Behaviour*, 92:143–149, 2014.

[9] Nicolas Perony, Rene Pfitzner, Ingo Scholtes, Claudio J. Tessone, and Frank Schweitzer. Enhancing consensus under opinion bias by means of hierarchical decision making. *Advances in Complex Systems*, 16:1350020, 2013.

[8] Anja Baigger, Nicolas Perony, Vera Leinert, Markus Melber, Stefanie Grunberger, Daniela Fleischmann, and Gerald Kerth. Bechstein's bats maintain individual social

links despite a complete reorganisation of their colony structure. *Naturwissenschaften*, 100(9):895–898, 2013.

[7] Miroslav Svercel*, Manuela Filippini*, Nicolas Perony*, Valentina Rossetti, and Homayoun C. Bagheri. Use of a four-tiered graph to parse the factors leading to phenotypic clustering in bacteria: a case study based on samples from the aletsch glacier. *PLOS ONE*, 8(5):e65059, 2013.

[6] Nicolas Perony and Simon W. Townsend. Why did the meerkat cross the road? flexible adaptation of phylogenetically-old behavioural strategies to modern-day threats. *PLOS ONE*, 8(2):e52834, 2013.

[5] Nicolas Perony, Claudio J. Tessone, Barbara Koenig, and Frank Schweitzer. How random is social behaviour? disentangling social complexity through the study of a wild house mouse population. *PLOS Computational Biology*, 8(11):e1002786, 2012.

[4] Gerald Kerth*, Nicolas Perony*, and Frank Schweitzer. Bats are able to maintain long-term social relationships despite the high fission-fusion dynamics of their groups. *Proceedings of the Royal Society B: Biological Sciences*, 278(1719):2761–2767, 2011.

Peer-reviewed conference proceedings

[3] Nicolas Perony, Rene Pfitzner, Ingo Scholtes, Frank Schweitzer, and Claudio J. Tessone. Hierarchical consensus formation reduces the influence of opinion bias. In *ECMS 2012 - Proceedings of the 26th European Conference on Modelling and Simulation*, pages 662–668, 2012.

[2] Nicolas Perony, Thomas R. Richardson, Marta B. Manser, and Frank Schweitzer. "Take me to your leader!": Inferring leadership in animal groups on the move. In *Proceedings of the Thirteenth International Conference on the Simulation and Synthesis of Living Systems (Artificial Life 13)*, pages 594–595. MIT Press, 2012.

[1] Nicolas Perony, Barbara Koenig, and Frank Schweitzer. A stochastic model of social interaction in wild house mice. In *Proceedings of the European Conference on Complex Systems 2010*, 2010.

Theses

Nicolas Perony. *Comparative analysis of social interactions in animal groups*. PhD thesis, ETH Zurich, 2012. DOI: 10.3929/ETHZ-a-007159348.

Nicolas Perony. GPS tracking and heart rate monitoring in meerkats: A technical approach. Master's thesis, National Institute for Applied Sciences (INSA) of Toulouse, 2008.

*Joint first authorship

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