

DR. NICOLÒ PAGAN

POST-DOCTORAL RESEARCHER

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SHORT BIO

Since May 2021 I am a Post-Doctoral researcher with the Social Computing Group at the University of Zürich. From January 2016 to April 2021, I was a Ph.D. candidate at the Automatic Control Laboratory at ETH Zürich, under the supervision of Prof. Florian Dörfler. I received my M.Sc. in Computational Science and Engineering in 2013 from EPF Lausanne, Switzerland, and my B.Sc. in Mathematical Engineering in 2010 from Polytechnic of Turin, Italy. From May 2013 to December 2015 I was Software Engineer at Ascomp AG, a spin-off of ETH Zürich, working as full-stack developer in the field of Computational Fluid-Dynamics.

SKILLS SET

- *Technical Skills.* During my academic studies, I built a solid background in mathematics, logic, data science, and algorithms. Thanks to my working experiences, I pushed my programming skills to a professional level.
- *Soft Skills.* Throughout my experiences, I have always shown strong problem solving attitude, and good communication and team-working skills. I trained my leadership skills by teaching graduate and undergraduate courses, and supervising students. I am willing to learn new competences and to share my expertise.

INTERESTS

I consider myself half-mathematician and half-computer scientist, with strong analytical skills and creative thinking. Since my childhood, I trained in these disciplines through the game of chess. My current research focus can be found at the intersection between Social Networks and Human/AI Decision Making, where I can work on mathematical modeling, complex systems, and data science. More broadly speaking, I am interested in Social and Engineering Systems and in problems that correspond to significant societal challenges, with an emphasis on areas such as autonomous systems, energy systems, finance, social networks, urban systems, and their underlying interconnections.

WORK EXPERIENCE

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| 05 / 2021 - present | Post-Doctoral Researcher , Social Computing Group, <i>University of Zürich</i> .
Advisor: Prof. Aniko Hánnák. |
| 05 / 2021 - 10 / 2021 | Post-Doctoral Researcher , Social Networks Lab, <i>ETH Zürich</i> .
Advisor: Prof. Christoph Stadtfeld. |
| 02 / 2021 - 06 / 2021 | Lecturer , Social Computing Group, <i>University of Zürich</i> . |
| 04 / 2013 - 12 / 2015 | Software Engineer and Research Consultant , <i>Ascomp AG, Zürich</i> (Switzerland).
Ascomp AG is a leading supplier of fluid-flow modelling solutions and simulation tools with emphasis on multiphase systems. I worked as full-stack developer, implementing new models and integrating them into the proprietary software <i>TransAT</i> . I also served as consultant to a number of industrial and research project. I was internal referent for the <i>Nuresafe</i> European project on nuclear power plants safety. I supervised interns and Master Thesis. |

07 / 2012 - 08 / 2012 **Internship**, FLUXiM AG, Winterthur (Switzerland).
 FLUXiM provides simulation software and measurement hardware for research and development of Organic Light Emitting Diodes (OLEDs) and solar cells.
 I designed, developed and validated the prototype of *Laoss*, a Finite Element Method (FEM) solver tailored for the simulation of large area OLEDs, displays or solar cells.

EDUCATION

01 / 2016 - 04 / 2021 **Ph.D. Candidate**, Automatic Control Laboratory, *ETH Zürich*.
 Thesis: *Modeling, analysis, and inference in social network formation*
 Advisor: Prof. Florian Dörfler.

09 / 2011 - 03 / 2013 **M.Sc. in Computational Science and Engineering** (5.45/6), *EPF Lausanne*.
 Thesis: *Coupling 1D system code OLGA with TransAT CFD*
 Advisors: Prof. François Gallaire, Dr. Sylvain Reboux

09 / 2010 - 07 / 2011 **Alta Scuola Politecnica (ASP) Advanced Educational program**,
Politecnico di Torino and Politecnico di Milano.

09 / 2007 - 10 / 2010 **B.Sc. in Mathematical Engineering** (110/110 Cum Laude), *Politecnico di Torino*.
 Thesis: *Analysis of an active speed bump model and the behaviour of a car at transit*
 Advisor: Prof. Luigi Preziosi

09 / 2002 - 07 / 2007 **Scientific High School Diploma** (100/100 Cum Laude), *Liceo Scientifico G. Bruno*, Venice.

HONORS & AWARDS

2021 Recipient of two-years funds within *NCCR Automation* on *Ethical auditing of control system methods*.

2019 Invited by the Department of Mathematical Sciences (DISMA) at Politecnico di Torino during the *Department of excellence 2018-2022* program; awarded a scholarship.

2011 Awarded a scholarship to participate to the Erasmus Program at EPF Lausanne.

2010 Admitted to the 7th cycle of *Alta Scuola Politecnica (ASP)* Educational Program.

2007 Rank 1st at the Engineering admission test (more than 4000 students) at Politecnico di Torino.

2007 Scientific High School Diploma, awarded with special distinction and a scholarship.

PUBLICATIONS

- [1] **N. Pagan**, W. Mei, C. Li, and F. Dörfler. "A meritocratic network formation model for the rise of social media influencers", *Nature Communications* 12, 6865 (2021) doi: [10.1038/s41467-021-27089-8](https://doi.org/10.1038/s41467-021-27089-8).
- [2] **N. Pagan**. "Can social network structure reveal human behavior?", "Behind the paper" blog post at *Behavioural and Social Sciences - Nature Research* (2019).
- [3] **N. Pagan** and F. Dörfler. "Game theoretical inference of human behavior in social networks", *Nature Communications* 10, 5507 (2019) doi: [10.1038/s41467-019-13148-8](https://doi.org/10.1038/s41467-019-13148-8).
- [4] **N. Pagan** and F. Dörfler, "Learning strategic behavior in social and economic networks", *The 7th International Conference on Complex Networks and Their Applications: book of abstracts*, p.207-209 (2018).
- [5] J. Bao, S. Reboux, **N. Pagan**, and D. Lakehal, "Cathare-TransAT Coupling for the Prediction of Boron Dilution in the ROCOM Test Facility", *16th International Topical Meeting on Nuclear Reactor Thermal Hydraulics*, Chicago, USA (2015).
- [6] S. Altazin, B. Perucco, **N. Pagan**, K. Lapagna, T. Lanz, R. Knaack, E. Knapp, B. Ruhstaller, "Multi-scale modeling of organic light-emitting devices", *SID Symposium Digest of Technical Papers* (2013).

WORKSHOPS AND SUMMER SCHOOLS

10 / 2021	<i>AI + X Summit, Zürich (Switzerland).</i>
06 / 2020	<i>Data Science in Techno-Socio-Economic Systems Online Workshop, ETH Zürich and NYU Courant.</i>
11 / 2019	<i>Networks Dynamics in the Social, Economic, and Financial Sciences Workshop, Torino (Italy).</i>
06 / 2018	<i>Summer School on Economic networks, Oxford (UK).</i>
10 / 2017	<i>Autonomous Decision-Making Workshop, ETH Risk Center, Zürich (Switzerland).</i>

RECENT CONFERENCE TALKS

08 / 09 / 2021	5 th European Conference on Social Networks, Naples (Italy) <i>"A meritocratic network formation model for User-Generated Content based platforms"</i>
12 / 12 / 2018	7 th International Conference on Complex Networks, Cambridge (UK) <i>"Learning strategic behavior in social and economic networks"</i>
12 / 06 / 2018	GameNet at NETSCI, Paris (France) <i>"Social network formation: from individual incentives to systemic stability"</i>
14 / 02 / 2018	Infrastructure Resilience Conference, Zürich (Switzerland) <i>"From individuals decisions to emerging social structure"</i>

INVITED TALKS

15 / 07 / 2021	Doctoral course on <i>Mining knowledge from complex networks</i> , Politecnico di Torino <i>"A meritocratic network formation model for the rise of social media influencers"</i>
12 / 12 / 2020	<i>Dynamics in Social and Economic Networks Workshop</i> , CDC 2020 (South Korea), online <i>"A meritocratic network formation model for the rise of social media influencers"</i>
21 / 09 / 2020	<i>Autonomy Talk</i> , IDSC ETH Zürich (Switzerland), online <i>"Game theoretical inference of human behavior in social networks"</i>
09 / 06 / 2020	<i>Intelligent Control Seminar</i> , Peking University (China), online <i>"Game theoretical inference of human behavior in social networks"</i>
28 / 11 / 2019	<i>Networks Dynamics in the Social, Economic, and Financial Sciences Workshop</i> , Torino (Italy) <i>"Game theoretical inference of human behavior in social networks"</i>

TEACHING EXPERIENCE

Spring 2021	Lecturer of Social Computing (undergraduate course), <i>Department of Informatics, University of Zürich.</i>
Spring 2019, 2020	Head Teaching Assistant in Game Theory and Control (graduate course), <i>Department of Information Technology and Electrical Engineering, ETH Zürich.</i>
Fall 2016, 2018, 2019	Teaching Assistant in Linear System Theory (graduate course), <i>Department of Information Technology and Electrical Engineering, ETH Zürich.</i>
Fall 2017	Head Teaching Assistant in Linear System Theory (graduate course), <i>Department of Information Technology and Electrical Engineering, ETH Zürich.</i>
Spring 2017, 2018	Teaching Assistant in Nonlinear Systems and Control (graduate course), <i>Department of Information Technology and Electrical Engineering, ETH Zürich.</i>
Spring 2012	Teaching Assistant in Informatics 2 (undergraduate course), <i>Artificial Intelligence Laboratory, EPF Lausanne.</i>

ADVISING EXPERIENCE

05 / 2022 - present	Maria Helena Margareta Pelli and Andrianos Michail, University of Zürich. Master Project: <i>"A longitudinal study of emotions on Twitter chains of re-tweets"</i>
03 / 2022 - 07 / 2022	Jules Authier, ETH Zürich. Semester Project: <i>"Analysis of the Closed-Loop between Recommender Systems and Opinion Dynamics"</i>
06 / 2021 - 11 / 2021	Michaël Blum, University of Zürich. Bachelor Thesis: <i>"Learning and success in chess: the role of openings patterns"</i>
09 / 2020 - 04 / 2021	Anna Maddux, ETH Zürich. Master Thesis: <i>"Behavior estimation in dynamic games"</i>
05 / 2020 - 12 / 2020	Cheng Li, ETH Zürich. Master Thesis: <i>"Data-driven analysis of the ranking-quality network formation model"</i>
05 / 2018 - 08 / 2018	Marco Buob, ETH Zürich. Semester Project: <i>"Dynamics of cooperative agents in social network formation: theory and simulation"</i>
10 / 2017 - 02 / 2018	Tomer Gidron, ETH Zürich. Semester Project: <i>"Centrality games in social and economic networks"</i>
02 / 2015 - 08 / 2015	Jiadong Bao, ETH Zürich. Master Thesis at ASCOMP AG: <i>"Cathare-TransAT Coupling for the Prediction of Boron Dilution in the ROCOM Test Facility"</i>
03 / 2014 - 08 / 2014	Hassan Bahramian, Politecnico di Milano. Master Thesis at ASCOMP AG: <i>"Coupling 1D System Code with TransAT CFD"</i>

REVIEW ACTIVITY

Automatica ◦ Chaos ◦ Journal of Complex Networks ◦ VLDB ◦ IEEE Transactions on Control of Network Systems ◦ Network Science Conference ◦ IFAC World Congress ◦ Complex Networks Conference ◦ European Control Conference ◦ International Conference on Computational Social Science (IC2S2) ◦ ACM Conference on Fairness, Accountability, and Transparency (FAccT) ◦ The Web Conference

LANGUAGE SKILLS

Italian: native, English: fluent, French: conversational, German: intermediate

PROGRAMMING SKILLS

C/C++: proficient, Python: proficient, Matlab: proficient, R: basic knowledge.

PERSONAL INTERESTS

Outdoor Sports, Chess, Photography, Traveling.