

# Matthieu Nadini

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Google Scholar: [My Profile](#)

## INTERESTS

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Network Science, Computational Social Science, Epidemiology, and Human Behavior.

## CURRENT POSITION

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**Postdoctoral Research Associate** Since 07/2020  
Joined the City, University of London and The Alan Turing Institute to work with Profs. Andrea Baronchelli, Alex Teytelboym, and Angela Gallo in the EPSRC funded project *COVID-19: Monitoring the effects of the pandemic on illicit online trade*. Working on temporal networks, analysis of large datasets, and human behavior.

## PREVIOUS POSITIONS

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**Assistant Researcher** 09/2017 - 06/2020  
Joined the Dynamical Systems Laboratory (supervisors: Profs. M. Porfiri and A. Rizzo) in New York University, Tandon School of Engineering. Working on temporal networks, epidemic spreading, and human behavior.

**Visiting Student Researcher** 01/2017 - 06/2017  
Between Greenwich University and Polytechnic of Turin. (supervisors: Profs. N. Perra and A. Rizzo). Worked on temporal networks and epidemic spreading.

**Student Researcher** 03/2015 - 05/2015  
Joined Profs. R. Serra, M. Villani, and A. Filisetti in University of Modena and Reggio Emilia.

## EDUCATION

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**PhD in Engineering** 09/2017 - 06/2020  
New York University, Tandon School of Engineering. PhD dissertation title: *Analysis and inference in temporal networks, with application to epidemic spreading*. Final Grade: A.

**M.Sc. and M2R in Physics of Complex Systems (joint degree Italy-France)** 09/2015 - 07/2017  
Final Mark: 110/110 Cum Laude (PoliTO) and 15.57/20 (Paris 7). Universities in the Consortium: SISSA, ICTP, PoliTO, ENS Cachan, Paris 6, Paris 7, and Paris 11. Dissertation title: *Epidemic spreading in modular time-varying networks*.

**B.Sc. in Physics** 09/2012 - 07/2015  
University of Modena and Reggio Emilia. Final Mark: 110/110 Cum Laude.

## RELEVANT COURSEWORK

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**As a PhD Student**  
Guided Readings on Complex Networks; and Epidemiology.

**As a Master Student**  
Neuroscience; Statistical Physics and Biophysics; Statistical Field Theory and Non Equilibrium Systems; Advanced Simulation Techniques; Algorithms for Optimization and Statistical Inference; and Applied Probability.

## JOURNAL PAPERS

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1. Bracci, A., **Nadini, M.**, Aliapoulios, M., McCoy, D., Gray, I., Teytelboym, A., Gallo, A., and Baronchelli, A. (2020) *The COVID-19 online shadow economy*. [Preprint arXiv:2008.01585](#).

2. **Nadini, M.**, Richmond, S., Huang, J., Rizzo, A., and Porfiri, M. (2020) *Design and feasibility study of the mobile application StopTheSpread*. IEEE Access (Early Access). Media: [YouTube](#) (2019 IF: 3.75). Download StopTheSpread in the [Google Play Store](#) or [Apple Store](#).
3. **Nadini, M.**, Zino, L., Rizzo A., and Porfiri, M. (2020) *A multi-agent model to study epidemic spreading and vaccination strategies in an urban-like environment*. Applied Network Science 5.1: 1-30. Media: [YouTube](#). (2019 CiteScore: 1.5).
4. **Nadini, M.**, Pongsachai, P., Spinello, C., Lombana, D. A. B., and Porfiri, M. (2020) *Empirical evidence of upward social comparison in a prisoner's dilemma game*. IEEE Access, 8, 52884-52894. Media: [YouTube](#). (2019 IF: 3.75).
5. **Nadini, M.**, Rizzo, A., and Porfiri, M. (2020). *Reconstructing irreducible links in temporal networks: which tool to choose depends on the network size*. Journal of Physics: Complexity,1.1: 015001 Media: [YouTube](#). (2019 IF: N.A.).
6. **Nadini, M.**, Bongiorno, C., Rizzo, A., and Porfiri, M. (2020). *Detecting network backbones against time variations in node properties*. Nonlinear Dynamics, 99: 855. Media: [YouTube](#). (2019 IF: 4.87).
7. **Nadini, M.**, Rizzo, A., and Porfiri, M. (2020). *Epidemic spreading in temporal and adaptive networks with static backbone*. IEEE Transactions on Network Science and Engineering. 7(1), 549-561. Media: [YouTube](#). (2019 IF: 5.21).
8. Ventura, R. B., Richmond, S., **Nadini, M.**, Nakayama, S., and Porfiri, M. (2019). *Does Winning or Losing Change Players' Engagement in Competitive Games? Experiments in Virtual Reality*. IEEE Transactions on Games. (In Press). Media: [YouTube](#). (2019 IF: 1.89).
9. **Nadini, M.**, Sun, K., Ubaldi, E., Starnini, M., Rizzo, A., and Perra, N. (2018). *Epidemic spreading in modular time-varying networks*. Scientific reports, 8(1), 2352. (2019 IF: 4.00).

## CONFERENCE PAPERS (PEER-REVIEWED)

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1. **Nadini, M.**, Rizzo, A., and Porfiri, M. (10/2019). *Contagion processes over temporal networks with time-varying backbones*. In ASME 2019 Dynamic Systems and Control Conference.
2. Villani, M., Filisetti, A., **Nadini, M.**, and Serra, R. (09/2015). *On the dynamics of autocatalytic cycles in protocell models*. In Italian Workshop on Artificial Life and Evolutionary Computation (pp. 92-105). Springer, Cham.

## ABSTRACTS IN CONFERENCES AND WORKSHOPS

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1. **Nadini, M.**, Rizzo, A., and Porfiri, M. *Detecting strong social ties in temporal networks*. IC2S2, July 17-20, 2020, 75 Amherst St. Cambridge, MA USA. (A.R. 40%)
2. **Nadini, M.**, Richmond, S., Huang, J., Rizzo, A., and Porfiri, M. *StopTheSpread: a mobile application to teach the best practices to prevent flu spreading*. ASME 2019 Dynamic Systems and Control Conference.
3. **Nadini, M.**, Sun, K., Ubaldi, E., Starnini, M., Rizzo, A., and Perra, N. *Epidemic spreading in modular time-varying networks*. NetSci 2018.

## TALKS AND POSTER PRESENTATIONS

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1. *Detecting strong social ties in temporal networks*. IC2S2, July 17-20, 2020, 75 Amherst St. Cambridge, MA USA. 8 min + Q.A.
2. *Backbone detection in temporal networks*. 2020 Webinar to CENTURI, Marsille. 30 min + Q.A.
3. *StopTheSpread: a mobile application to teach the best practices to prevent flu spreading*. ASME 2019 Dynamic Systems and Control Conference. Poster presentation.
4. *Contagion processes over temporal networks with time-varying backbones*. ASME 2019 Dynamic Systems and Control Conference. 15 min + 5 min Q.A.

5. DSL weekly seminars: (i) *Epidemic spreading in time-varying networks* Spring 2018; (ii) *Detecting network backbones against time variations in node properties*. Spring 2019; (iii) *Empirical evidence of upward social comparison in a prisoner's dilemma game*. Fall 2019; (iv) *Epidemic spreading and vaccination strategies in a urban-like environment*. Spring 2020; (v) *StopTheSpread: a mobile application to teach the best practices to prevent flu spreading*. Spring 2020. 30 min (questions included).
6. *Network-Based Modeling of Infectious Disease Epidemics in a Mobile Population*. 2018 Tandon Research Expo. Poster presentation.

## OUTREACH ACTIVITIES

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(i) *Lehman College City of Science*. July 27, 2019, Bronx, NY; (i) *NYU World Science Fair festival*. June 2, 2019, New York, NY; (iii); *Gowanus Voyage!*. July 14, 2018, Brooklyn, NY; (iv) *NY Aquarium*, May 25, 2018, Brooklyn, NY; (v) *NYU Tandon Research Expo*. April 27, 2018, Brooklyn, NY; and (vi) *NYU Brooklyn Community Outreach Event*. September 30, 2017, Brooklyn, NY.

## AWARDS

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### As a PhD Student

1. *SoE Fellowship*. Since 02/2018. Awarded to serve NYU Tandon School of Engineering as instructor.
2. *National Science Foundation grant No. CMMI-1561134*. Since 09/2017. Awarded to perform cutting-edge research in the fields of temporal networks, networks inference, and epidemic spreading.
3. *Travel grant*. Grant to attend the ASME 2019 Dynamic Systems and Control Conference.

### As a Master Student

1. Grant to perform my master thesis in the University of Greenwich, mentored by Prof. N. Perra.
2. Erasmus+ to study abroad in Paris universities: ENS Cachan, Paris 6, Paris 7, and Paris 11.
3. Grant to study abroad in Trieste universities: SISSA and ICTP.

### As a Undergraduate Student

1. Grant for the overall performance at the end of my undergraduate studies.
2. Grant for the performance at the end of second year of studies.

## TEACHING

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### Attended the NYU Teaching Program

Fall 2019

Five sessions on (one per week): (i) *Making Learning Stick*, (ii) *Problem Solving and Problem Posing*, (iii) *Writing to Learn*, (iv) *Critical Reading*, and (v) *Syllabus and Course Design*.

### Instructor

Responsible for independently teaching the labs, correcting the lab reports, listening the students' presentation, and giving the final grades.

Total number of students: **137**. Weighted grade: **4.4/5.0**.

Statics Laboratories: Spring 2020 (Grade: 4.0/5.0), Fall 2019 (Grade: 4.5/5.0), Spring 2019 (Grade: 4.8/5.0), Spring 2019 (Grade: 4.3/5.0), and Fall 2018 (Grade: 3.8/5.0).

MoM Laboratory: Fall 2018 (Grade: 4.3/5.0).

### Selection of comments from the students

1. The instructor, Matthieu Nadini, was very clear when explaining the procedure of the lab and very helpful when we needed assistance. His grading was very fair and made the overall course very enjoyable.
2. The instructor gives very good feedback on reports, definitely could use the tips for future reference.

## LEADERSHIP WORKSHOPS AND EXPERIENCE

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### Leadership Lab Advanced Course

Fall 2019

Held at NYU Tandon (New York, Usa). Intensive leadership lab course comprehending 8 sessions (one per week): (i) *Personal Values*, (ii) *Reflection and Applications*, (iii), *Resiliency*, (iv) *Productive Relationships*, (v) *Group Development*, (vi) *Conflict Negotiation*, (vii) *Social Justice*, and (viii) *Vision and Goals*.

### CATalyst Leadership Summit

11/09/2019

Held at NYU Tandon (New York, USA). One day workshop on leadership.

### High school's captain

10/2009 - 10/ 2010

Improved my public speaking and leadership skills. School size of about 1300 students.

## MENTORING

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### Graduate Student

1. Huang, J. Mentoring period: Summer 2019 and January 2020. From this work, we uploaded StopTheSpread in the Google play store! Links: [Google Play Store](#) and [Apple Store](#).

### Undergraduate Students

1. Pongsachai, P. Mentoring period: Summer 2019. From this work, we published a journal paper in IEEE Access! [YouTube](#)
2. Santiago, D. E. Mentoring period: 6 weeks in Summer 2019. Project on modelling disease spreading in a network of random walkers.
3. Richmond, S. Mentoring period: Spring 2019. From this work, we uploaded StopTheSpread in the Google play store! Links: [Google Play Store](#) and [Apple Store](#).
4. Richmond, S. Mentoring period: Summer 2018. The work is in press in IEEE Transactions on Games! [YouTube](#)

## STUDENT'S THESIS

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### Project

1. Huang, J. did his master project and thesis under the supervision of Prof. Porfiri and me. Title: *StopTheSpread: a mobile application to teach the best practices to prevent flu spreading*.

## PROPOSAL WRITING

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### Lectures attended

1. *National Science Foundation: Proposal Writing Tips for Young Investigators*. ASME 2019 Dynamic Systems and Control Conference.
2. *Grantsmanship for Students and Postdocs: Pathway to Individual Fellowship*. New York Academy of Sciences 2019.

### Writing

1. *Marron Seed Grant*. NYU Marron Institute of Urban Management (2018, December). Call: [Marron Grant](#).
2. *LEAP HI*. National Science Foundation (2019, September). Program Solicitation: NSF 17-602. (Only paperwork).

## GRANT MANAGEMENT

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**Network-based Modeling of Infectious Disease Epidemics in a Mobile Population: Strengthening Preparedness and Containment**

01/2018 - 03/2020

Grant info: National Science Foundation grant No. CMMI-1561134.

- Collect information and write a first draft for the grant annual report for the annual periods 2017/2018 and 2018/2019.
- Perform the monthly budget checking to make sure the grant is properly spent.

## EXPERIMENTS WITH HUMAN SUBJECTS

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### Protocols

# 2 **StopTheSpread: a mobile application to teach the best practices to prevent flu spreading** 2019

# 1 **Empirical evidence of upward social comparison in a prisoner's dilemma game** 2019

Responsible for preparing, submitting, and revising the experimental protocols, which have to be approved by the University's Institutional Review Board (IRB).

## STATISTICAL ANALYSIS

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I have experience in using several statistical analysis tools.

- Parametric and non-parametric analysis: t-test, Anova, Wilcoxon signed-rank, Kruskal–Wallis, Kolmogorov-Smirnov, and Shapiro-Wilk tests.
- Methods to combine p-values: Fisher and Stouffer's Z-score.
- Multiple test comparison: Bonferroni correction and False Discovery Rate.

## REVIEWER

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### Certified Peer Reviewer Course

Certificate of Excellence, Elsevier Researcher Academy, September 2019.

### Program Committee Member

Complex Networks 2020.

### Journal

New Journal of Physics and Journal of Physics: Complexity.

### Conferences

ICWSM 2020 and 2021, ISCAS 2018 and 2019, DSCC 2019, and Complex Networks 2019.

## PROGRAMMING LANGUAGES

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- Proficient in Python (libraries: numpy, pandas, seaborn, matplotlib, and sklearn) and C++.
- Good in Mathematica, Linux Bash, Matlab, and R.
- Basic in Netlogo, Fortran, Julia, and Origin Lab.

## EDITOR PACKAGES

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Proficient in L<sup>A</sup>T<sub>E</sub>X, Office Package, and PowerPoint.

## OS PREFERENCE

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Proficient on both Windows and Linux (Ubuntu).

## SOFTWARE

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1. Analysis of our online feasibility study of the mobile application StopTheSpread [here](#).
2. Sample C++ code of our urban-like environment are available [here](#).
3. Several backbone detection tools in Python 2.7 are available [here](#).
4. StopTheSpread an official education mobile application of New York University. Links: [Google Play Store](#), [Apple Store](#), and Amazon tablets. The Amazon tablet (.apk version) is available upon request.

## VIDEO EDITING

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Good in both PowerPoint and DaVinci Resolve.

## AFFILIATION

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**Network Science Society**

Since 01/2020

**New York Academy of Science**

Since 09/2017

## LANGUAGES

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Proficient in Italian (mother tongue) and English.

## OTHER EXPERIENCE

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**Semi-professional soccer player in Bologna F.c. (Italy) youth's teams**

2006-2010

Lesson learned: collaboration is essential to reach common and ambitious goals.

**Donor at ADMO and AVIS**

2011-2017

In Modena (Italy). ADMO: Association of Bone Marrow Donors. AVIS: Association of Voluntary Italian Blood Donors.

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