E.S. Carolina Mattsson

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PERSONAL DETAILS

Name: Elna Sofia Carolina Mattsson
Nationality: Sweden & United States
Place of birth: Göteborg, Sweden
Date of birth: 1992-08-02

EDUCATION

Ph.D.	**Northeastern University**, Network Science Institute	2020
B.A.	**Lehigh University**, Department of International Relations	2014
B.S.	**Lehigh University**, Department of Physics	2014

RESEARCH POSITIONS

Researcher 2023-present
CENTAI (Research Institute at Intesa Sanpaolo) Turin, Italy
Develop computational methods for marcoeconomic measurement from digital transaction records, such as from CBDCs. Further collaborative projects involving inter-firm transaction networks, digital payment systems, and synthetic data generation for anti-financial crime initiatives. Supervise M.Sc. students at University of Turin.

Postdoctoral Researcher 2020-2022
Leiden Institute of Advanced Computer Science Leiden, Netherlands
Completed projects mapping real-world payment systems from digital transaction records, the graph structure of production networks, and temporal networks. Drove a research collaboration involving multiple universities and government departments. Supervised and co-supervised M.Sc. students in the Computational Network Science Lab.

Graduate Research Fellow 2014-2020
Network Science Institute, Northeastern University Boston, MA
Developed theoretical and computational frameworks for analyzing financial networks using transaction-level data. Furthered methodological innovations in computational social science through integration of digital trace, administrative, and survey data (Lazer Lab). Funded by National Science Foundation Graduate Research Fellowship.

JOURNAL ARTICLES

Network growth under opportunistic attachment 2025
Carolina Mattsson. *Applied Network Science* 10:21.
DOI: 10.1007/s41109-025-00706-x

Multi-Class and Multi-Task Strategies for Neural Directed Link Prediction 2025
Claudio Moroni, Claudio Borile, Carolina Mattsson, Michele Starnini, Andre Panisson
Machine Learning and Knowledge Discovery in Databases, European Conference.
DOI: 10.48550/arXiv.2412.10895

Identifying successful teams in the European player transfer network 2024
Tristan J. Dieles, Carolina Mattsson, Frank Takes. *Applied Network Science* 9:65.
DOI: 10.1007/s41109-024-00675-7

Circulation of a digital community currency 2023
Carolina Mattsson, Teodoro Criscione, Frank Takes. *Scientific Reports* 13:5864.
DOI: 10.1038/s41598-023-33184-1

CADENCE: Community-Aware Detection of Dynamic Network States 2023
Maxwell McNeil, Carolina Mattsson, Frank Takes, Petko Bogdanov. In *Proceedings of the 2023 SIAM International Conference on Data Mining (SDM)* 1-9.
DOI: 10.1137/1.9781611977653.ch1

Sarafu Community Inclusion Currency 2020-2021 2022
Carolina Mattsson, Teodoro Criscione, William Ruddick. *Scientific Data* 9:426.
DOI: 10.1038/s41597-022-01539-4

Functional structure in production networks 2021
Carolina Mattsson, Frank Takes, Eelke Heemskerk, Cees Diks, Gert Buiten, Albert Faber, Peter Sloot. *Frontiers in Big Data* 4:666712.
DOI: 10.3389/fdata.2021.666712

Trajectories through temporal networks 2021
Carolina Mattsson & Frank Takes. *Applied Network Science* 6(1), 1-31.
DOI: 10.1007/s41109-021-00374-7

PREPRINTS

Holding periods: Inverse estimation of money velocity 2025
Carolina Mattsson, Allison Luedtke, Frank Takes *arXiv:2209.01512*

Networks of monetary flow at native resolution 2019
Carolina Mattsson *arXiv:1910.05596*

Context-specific hybrid data collection for social ties in action *prep*
Carolina E.S. Mattsson, Drew Margolin, Stefan Wojcik, David Lazer

POLICY ARTICLES

Network analysis insights for cluster-oriented energy policy 2022
Gert Buiten, Cees Diks, Albert Faber, Eelke Heemskerk, Carolina Mattsson, Frank Takes, Peter Sloot. *Economisch Statistische Berichten* 106(4804).

PUBLIC REPORTS

Understanding Key Mobile Money Users 2018
Carolina Mattsson & Guy Stuart. *International Finance Corporation*

Combating fake news: An agenda for research and action 2017
David Lazer, Matthew Baum, Nir Grinberg, Lisa Friedland, Kenneth Joseph, Will Hobbs, Carolina Mattsson. *Shorenstein Center, Harvard Kennedy School*

COMMENTS

Computational social science with confidence 2024
Carolina Mattsson. *EPJ Data Science* 13:3.
DOI: 10.1140/epjds/s13688-023-00435-0

Why is inequality bad?
Social Science Space Blog. SAGE Publishing 2019
Theory and tools in the age of big data
SAGE Ocean Blog. SAGE Publishing 2019
Expert Commentary: The Digital Currency Problem
Undergraduate Mathematics and Its Applications Vol 40.2-3. COMAP 2019

POLICY & INDUSTRY

Central Bank of Brazil, Dutch Ministry of Economic Affairs and Climate, Statistics Netherlands, Grassroots Economics, ING Bank, International Finance Corporation (World Bank Group), Microfinance Opportunities, Cignifi Inc., Telenor Research.

SEMINARS & **INVITED TALKS**	2025	Complexity in Economics & Finance, Conference on Complex Systems, Siena
	2025	Leiden Complex Networks Network Seminar, Leiden University
	2025	Complexity Economics Seminar, Torino, Italy
	2025	Santa Fe Institute, Santa Fe, NM
	2024	ComplexTime Satellite, Conference on Complex Systems, Exeter, UK
	2024	Bank Indonesia Institute, Jakarta, Indonesia
	2024	Hypergraphs: Theory and Applications, Isaac Newton Institute, London, UK
	2024	Complexity Economics Seminar, Torino, Italy
	2024	Network Science Institute, Northeastern University, Boston, MA
	2024	Center for Collective Learning, Corvinus University, Budapest, Hungary
	2023	Computational Network Science Group, Leiden University, NL
	2023	Oxford Network Seminar, Oxford University, UK
	2023	Institute for Analytical Sociology Seminar, Linköping University, Sweden
	2022	1st Interdisciplinary Workshop on Firm-Level Supply Networks, Complexity Science Hub, Vienna, Austria
	2022	NETWORKS Unit, Scuola IMT Alti Studi Lucca, Italy
	2022	Socioeconomic Networks Workshop, Waseda University, Tokyo, Japan
	2022	Informatics Institute & ILLC, University of Amsterdam, Amsterdam, NL
	2022	Physics of Information and Quantum Technologies Group, Instituto de Telecomunicações, Instituto Superior Técnico, Universidade de Lisboa, Portugal
	2022	Networks Webinar Series, Janeway Institute Cambridge, UK
	2021	Network Science Institute, Northeastern University, Boston, MA
	2021	CID Growth Lab, Harvard Kennedy School, Cambridge, MA
	2021	ANET Lab, ELKH Centre for Economic and Regional Studies, Hungary
	2021	Eurasian Summit for Models of Society, Tokyo Institute of Technology, Japan
	2020	Leiden Complex Networks Network Seminar, Leiden University, NL
	2020	Dutch Network Economics Day, Tinbergen Institute, Amsterdam, NL
	2020	Economics Department Seminar, St. Olaf College, St. Olaf, MN
	2020	The B.E.S.T. Workshop and Satellite of NetSci-X Tokyo on "Complex Systems in Finance and Economics", Kyoto University, Japan
	2019	CID Growth Lab, Harvard Kennedy School, Cambridge, MA
	2018	Telenor Research, Telenor

AWARDED **GRANTS**	$46,000	**National Science Foundation**	2019
	INTERN Supplemental Funding Opportunity		
	$100,000	**Bill & Melinda Gates Foundation**	2016
	with Guy Stuart, Executive Director, Microfinance Opportunities		
	$138,000	**National Science Foundation**	2015
	Graduate Research Fellowship Program		

HONORS & **AWARDS**	• Networks 2021 Best Pitch Talk Award	2021
	• NSF Graduate Research Fellowship	2015
	• NULab for Text, Maps, and Networks Fellowship	2014
	• Oles M. Smolansky Award for Academic Excellence in IR	2014
	• Donald T. Campbell Social Science Research Prize	2014
	• Lemmon Prize	2014
	• National Undergraduate Fellowship	2013
	• Malcolm J. Gordon, Jr. Physics Prize	2011
	• Lehigh University Academic Merit Award	2010
	• National Merit Scholar	2009

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LEADERSHIP	**Workshop on Economic and Financial Networks**	
	Organizer, StatPhys Florence	2025
	Lead organizer, NetSci Maastricht	2025
	Lead organizer, NetSci Québec City	2024
	Lead organizer, CCS Salvador da Bahia	2023
	Organizer, NetSci Vienna	2023
	Organizer, CCS Mallorca	2022
	Lead organizer, NetSci-X Tokyo	2020
	Organizer, NetSci Burlington	2019
	Dutch Network Science Society Symposium	
	Lead organizer, Leiden University	2022

REVIEWING

- Nature Communications
- EPJ Data Science
- Applied Network Science
- Japanese Economic Review
- Entropy
- Scientific Reports
- Royal Society Open Science
- Social Networks
- Frontiers in Big Data
- PLOS ONE

SERVICE	**Conferences in Complex Systems**	
	Program Committee Member, CCS Siena	2025
	Program Committee Member, FRCCS Bordeaux	2025
	Program Committee Member, CCS Exeter	2024
	Conferences in Network Science	
	Program Committee Member, NetSci Maastricht	2025
	Program Committee Member, ComplexNetworks Binghamton NY	2025
	Program Committee Member & Session Chair, NetSci Québec City	2024
	Program Committee Member, ComplexNetworks Istanbul	2024
	Program Committee Member & Session Chair, NetSci-X Venice	2024
	Program Committee Member, NetSci Vienna	2023
	Program Committee Member, ComplexNetworks Menton	2023
	Program Committee Member, NetSci Shanghai	2022
	Program Committee Member, NetSci-X Porto	2022
	Program Committee Member, Networks	2021
	Program Committee Member, NetSci Rome	2020
	Program Committee Member, NetSci-X Tokyo	2020
	School, Satellite, and Poster Committee Member, NetSci Burlington	2019
	Invited Speaker Liaison, CompleNet Boston	2018
	Conference in Computational Social Science	
	Program Committee Member, IC2S2 Copenhagen	2023
	Program Committee Member, IC2S2 Chicago	2022
	Program Committee Member & Session Chair, IC2S2 Zurich	2021
	Program Committee Member, IC2S2 Cambridge, MA	2020
	Program Committee Member, IC2S2 Amsterdam	2019
	Southern Economics Association Annual Meeting	
	Discussant, Houston, TX & New Orleans, LA	2020-21

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TEACHING

FIS0186: Complexity Economics   2025
Lecture 7: Financial Networks   University of Torino

LISS238: Social Network Analysis   2020-2026
London Interdisciplinary Social Science Doctoral Training Partnership   King's
College London

DS2001: Programming with Data Social Science Practicum   2019
Khoury College of Computer Sciences   Northeastern University

SUPERVISION

Luca Bonanno*   M.Sc. Complex Systems, University of Torino   *ongoing*
Matching in credit markets for economic ABMs (with Bank of Brasil)

Enrico Fracasso*   M.Sc. Complex Systems, University of Torino   10-2025
Structural Stability in Soccer: A Dynamic Graph Approach with a Large Events Model

Sadaf Ismaeli Rad   B.Sc. Computer Science, Leiden University   08-2025
From Global Network Attributes to Temporal Motifs: Predicting User Retention in the Sarafu Network

Claudio Cellerini*   M.Sc. Complex Systems, University of Torino   04-2025
Activity-Driven Modeling of Financial Transactions Networks

Alireza Samiei*   M.Sc. Media Technology, Leiden University   04-2023
The Co-investment Network of the Dutch Entrepreneurial Ecosystem

Tristan Dielles   B.Sc. Computer Science, Leiden University   08-2022
Description of transfer networks in football

Philippe Bors*   M.Sc. Computer Science, Leiden University   08-2022
Local network connectivity structure and link prediction

Jingsen Chen   M.Sc. Computer Science, Leiden University   04-2021
Impact of Financial Activity On Trajectory Heuristics

Martijn Vlak   M.Sc. ICT in Business, Leiden University   03-2021
Impact of the intelligent lockdown on the Dutch inter-industry transaction network

Niek Buwalda   M.Sc. Computer Science, Leiden University   08-2020
Obtaining a network-driven understanding of the differences in user-level interaction within topical online communities

Roshni Padhi*   Research Science Institute Summer Program, MIT   07-2018
Following the Money: Analyzing Mobile Money Networks in Developing Countries

* served as primary thesis advisor