

Carmela Bernardo
Postdoctoral Researcher
Department of Electrical Engineering
Linköping University, Linköping, Sweden

EDUCATION

Ph.D. in Systems and Control Engineering 2018–2022

University of Sannio, Benevento, Italy

Research field: *Analysis and modeling of opinion dynamics*

Thesis title: *Convergence analysis of heterogeneous opinion dynamics with bounded confidence and stubbornness*

Supervisor: *Prof. Francesco Vasca*

Visiting Ph.D. Student 2020

Linköping University, Linköping, Sweden

Research field: *Applications of opinion dynamics models*

Supervisor: *Prof. Claudio Altafini*

Courses in anthropo-psycho-pedagogical disciplines and teaching methodologies 2018

University of Sannio, Benevento, Italy

Master's Degree in Computer Engineering 2016–2018

University of Sannio, Benevento, Italy

Thesis title: *Competition and generosity in the analysis of consensus in dynamic social networks*

Supervisor: *Prof. Francesco Vasca*

Grade: *110/110 cum laude*

Bachelor's Degree in Computer Engineering 2012–2015

University of Sannio, Benevento, Italy

Thesis title: *Design and development of a system to measure the position of UAVs in a defined space*

Supervisor: *Prof. Pasquale Daponte*

Grade: *110/110 cum laude*

Scientific High School Diploma 2007–2012

Higher Education Institution “Alfonso Maria de’ Liguori”, Sant’Agata de’ Goti (BN), Italy

Grade: *100/100*

ACADEMIC EXPERIENCE

Postdoctoral Researcher 2022–...

Linköping University, Linköping, Sweden

Research field: *Analysis and applications of opinion dynamics models*

WORK EXPERIENCE

Tutor for undergraduate students 2018

CentroStudi srls, Benevento, Italy

- *Lessons in Engineering, Mathematics, Statistics, and Physics*
- *Tutor of a Bachelors degree thesis in Computer Engineering titled “Process management and synchronization”*

Teacher of Information and Communication Technology (ICT) in professional training courses 2018

CentroStudi srls, Benevento, Italy

RESEARCH EXPERIENCE

Co-supervisor

- Master’s degree thesis in Computer Engineering titled “A profiling algorithm for multilayer social networks” 2020

Participation in projects

- Impact assessment for the project *PFP. Progetti Formativi Personalizzati* 2019–2022
- Network analysis for the project *I Piccoli Comuni del Welcome* 2019–2021

Reviewer for international journals

- *Automatica*
- *Discrete and Continuous Dynamical Systems - Series B*
- *IEEE Control Systems Letters*
- *IEEE Transactions on Automatic Control*
- *IEEE Transactions on Control of Network Systems*
- *IEEE Transactions on Network Science and Engineering*
- *Information Fusion*
- *International Journal of Hydrogen Energy*
- *Journal of Power Sources*
- *Knowledge and Information Systems*
- *Mathematical Problems in Engineering*
- *Nonlinear Analysis: Hybrid Systems*
- *SIAM Journal on Applied Dynamical Systems*

Reviewer for international conferences

- *American Control Conference*
- *European Control Conference*
- *IEEE Conference on Control Technology and Applications*
- *IEEE Conference on Decision and Control*
- *IFAC World Congress*
- *International Conference on System Theory, Control and Computing*
- *Mediterranean Conference on Control and Automation*

PUBLICATIONS

Journal papers

1. L. Wang, G. Chen, **C. Bernardo**, Y. Hong, G. Shi, C. Altafini, “Social power games in concatenated opinion dynamics”, *IEEE Transactions on Automatic Control*, 2023 [Previsionally accepted]
2. **C. Bernardo**, C. Altafini, A. V. Proskurnikov, F. Vasca, “Bounded confidence opinion dynamics: A survey”, *Automatica*, vol. 159, pp. 1–42, 2024
3. **C. Bernardo**, L. Wang, M. Fridahl, C. Altafini, “Quantifying leadership in climate negotiations: A social power game”, *PNAS Nexus*, 2023
4. L. Wang, **C. Bernardo**, Y. Hong, F. Vasca, G. Shi, C. Altafini, “Consensus in concatenated opinion dynamics with stubborn agents”, *IEEE Transactions on Automatic Control*, vol. 68, no. 7, pp. 4008–4023, 2023
5. **C. Bernardo**, C. Altafini, F. Vasca, “Finite-time convergence of opinion dynamics in homogeneous asymmetric bounded confidence models”, *European Journal of Control*, vol. 68, pp. 1–6, 2022
6. **C. Bernardo**, F. Vasca, R. Iervolino, “Heterogeneous opinion dynamics with confidence thresholds adaptation”, *IEEE Transactions on Control of Network Systems*, vol. 9, no. 3, pp. 1068–1079, 2022
7. **C. Bernardo**, L. Wang, F. Vasca, Y. Hong, G. Shi, C. Altafini, “Achieving consensus in multilateral international negotiations: The case study of the 2015 Paris Agreement on climate change”, *Science Advances*, vol. 7, no. 51, pp. 1–16, 2021
8. F. Vasca, **C. Bernardo**, R. Iervolino, “Practical consensus in bounded confidence opinion dynamics”, *Automatica*, vol. 129, pp. 1–11, 2021

Conference papers

1. T. Srivastava, **C. Bernardo**, S. Baccari, F. Vasca, “An experimental verification for Hegselmann–Krause opinion dynamics”, *International Conference on System Theory, Control and Computing*, pp. 209–214, Timisoara, Romania, October 2023
2. A. Pepiciello, **C. Bernardo**, J. L. Domínguez-García, “Modeling of multi-energy systems as multilayer networks”, *IEEE PowerTech*, pp. 1–6, Belgrade, Serbia, June 2023
3. T. Srivastava, **C. Bernardo**, C. Altafini, F. Vasca, “Analyzing the effects of confidence thresholds on opinion clustering in homogeneous Hegselmann–Krause models”, *Mediterranean Conference on Control and Automation*, pp. 587–592, Limassol, Cyprus, June 2023
4. L. Wang, **C. Bernardo**, Y. Hong, F. Vasca, G. Shi, C. Altafini, “Achieving consensus in spite of stubbornness: Time-varying concatenated Friedkin–Johnsen models”, *IEEE Conference on Decision and Control*, pp. 4964–4969, Austin, Texas, December 2021
5. **C. Bernardo**, F. Vasca, “A mixed logical dynamical model of the Hegselmann–Krause opinion dynamics”, *IFAC-PapersOnLine*, vol. 53, no. 2, pp. 2826–2831, Berlin, Germany, July 2021

Books

1. F. Vasca, D. Ricci, **C. Bernardo**, “Analisi numerica delle reti sociali: Una guida operativa all’uso di MATLAB e R” [“Numerical analysis of social networks: An application guidance to the use of MATLAB and R”], Independently published, ISBN: 979-8407408925, 2022

Chapters in books

1. A. Pepiciello, J. L. Domínguez-García, **C. Bernardo**, “Complex network analysis of multi-energy systems”, in C. Ocampo-Martínez, N. Quijano (eds.), *Towards energy systems integration for multi-energy systems*, Springer, 2024 [Under Review]
2. I. Marotta, **C. Bernardo**, A. Moretti, F. Giangregorio, F. Vasca, “Social network analysis for welcome policies: An empirical study from small Italian municipalities”, in G. Giordano, M. Restaino, A. Salvini (eds.), *Methods and applications in social networks analysis*, FrancoAngeli, 2021
3. **C. Bernardo**, G. D. Giorgione, I. Marotta, F. Vasca, “La rete di comunicazione” [“The communication network”], in C. Di Perna, G. D. Giorgione, A. Moretti (eds.), *Ricucire le campanelle*, Editrice AVE, 2019

Theses

1. **C. Bernardo**, “Convergence analysis of heterogeneous opinion dynamics with bounded confidence and stubbornness”, DOI: 10.13140/RG.2.2.25699.43044, 2022

Magazine articles

1. F. Vasca, D. Ricci, A. Moretti, **C. Bernardo**, “Fare rete per costruire politiche d’inclusione: Il caso-studio delle cooperative di comunità nei piccoli comuni” [“Networking to build inclusion policies: The case study of community cooperatives in small municipalities”], *Welfare Oggi*, no. 1, pp. 5–10, 2021

Workshops

1. **C. Bernardo**, F. Vasca, D. Ricci, “Using MATLAB for social networks analysis”, *European Conference on Social Networks*, Napoli, Italy, September 2021

Extended abstracts

1. **C. Bernardo**, L. Wang, Y. Hong, F. Vasca, G. Shi, C. Altafini, “Achieving consensus in spite of stubbornness in opinion dynamics: A model and an application”, *Reglermöte*, Luleå, Sweden, June 2022
2. **C. Bernardo**, F. Vasca, R. Iervolino, “Practical clustering in bounded confidence opinion dynamics”, *Automatica.it*, Catania, Italy, September 2021
3. L. Wang, **C. Bernardo**, Y. Hong, F. Vasca, G. Shi, C. Altafini, “Achieving consensus in spite of stubbornness: Time-varying concatenated Friedkin–Johnsen models”, *Chinese Control Conference*, Shanghai, China, July 2021
4. **C. Bernardo**, F. Vasca, “A profiling algorithm based on multilayer networks”, *Networks*, Washington, USA, July 2021

5. **C. Bernardo**, F. Vasca, “Hegselmann–Krause model in mixed logical dynamical formulation”, *Automatica.it*, Cagliari, Italy, September 2020
6. I. Marotta, **C. Bernardo**, A. Moretti, F. Giangregorio, F. Vasca, “A social network model for welcome policies: An empirical study from small Italian municipalities”, *International Workshop on Social Network Analysis*, Vietri sul Mare (SA), Italy, October 2019
7. **C. Bernardo**, F. Vasca, R. Iervolino, “Confidence thresholds sensitivity in heterogeneous opinion dynamics”, *Automatica.it*, Ancona, Italy, September 2019

Posters

1. **C. Bernardo**, F. Vasca, C. Altafini, “Bounded confidence model: Analysis of steady-state behaviors and convergence time”, *ELLIIT Annual Workshop*, Linköping, Sweden, October 2022
2. D. Ricci, F. Vasca, **C. Bernardo**, B. Cutispoto, A. Moretti, “Social network analysis per reti di comunità” [“Social network analysis for community networks”], *Workshop “Le persone con disabilità tra società, economia e diritto: questioni aperte e prospettive di riforma”*, Benevento, Italy, September 2022

Project reports

1. D. Ricci, B. Cutispoto, **C. Bernardo**, A. Moretti, F. Vasca, “Fare rete per costruire nuove alleanze educative. Il caso-studio del nodo territoriale di Torino” [“Networking to build new educational alliances. The case study of the territorial node of Torino”], Project *PFP. Progetti Formativi Personalizzati*, 2022
2. D. Ricci, B. Cutispoto, **C. Bernardo**, A. Moretti, F. Vasca, “La rete dei disconnessi. Una mappatura territoriale per il contrasto alle povertà educative” [“The network of disconnected ones. A territorial mapping for the educational poverty reduction”], Project *PFP. Progetti Formativi Personalizzati*, 2022
3. D. Ricci, F. Vasca, **C. Bernardo**, “Reti interorganizzative per cooperative di comunità. Analisi di rete per politiche di accoglienza nelle periferie cittadine” [“Inter-organizational networks for cooperatives of community. Network analysis for welcome policies on city outskirts”], Project *I Piccoli Comuni del Welcome*, 2020

SKILLS

Languages: *English, Italian (Mother tongue)*

Coding: *Java, C, C++, Python, Matlab/Simulink, R, HTML*

Miscellaneous: *OpenCV, L^AT_EX*

OTHER ACTIVITIES

Member of the spin-off company <i>Nesyt. Networks, Systems, Technologies</i>	2019–...
Awarded high school teaching expertise: A-41 <i>Computer Science and Information Technologies</i>	2022
Volunteer at <i>European Control Conference</i> , Napoli, Italy	2019
Winner of <i>ETIC Award 2018–2019</i> promoted by AICA and Rotary International	2019

AFFILIATIONS

Member of <i>IEEE Control Systems Society</i>	2020–...
IEEE Member	2019–...
Ordinary member of SIDRI (Società italiana del dottorato di ricerca)	2019–...
Member of ADI (Associazione dottorandi e dottori di ricerca in Italia)	2018–...
Member of <i>Alumni Unisannio</i>	2018–...

La sottoscritta, consapevole che – ai sensi dell’art. 76 del D.P.R. 445/2000 – le dichiarazioni mendaci, la falsità negli atti e l’uso di atti falsi sono puniti ai sensi del codice penale e delle leggi speciali, dichiara che le informazioni rispondono a verità.