

# ANGELA FONTAN

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📍 Division of Decision and Control Systems, KTH Royal Institute of Technology, Stockholm, Sweden  
🗣️ Italian (mother tongue), English (fluent), Swedish (beginner)

## Education

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- 2016-2021** Ph.D. in Electrical Engineering with Specialization in Automatic Control  
Linköping University, Linköping, Sweden, 2021.  
Title: Collective decision-making on networked systems in presence of antagonistic interactions  
Supervisor: Prof. Claudio Altafini
- 2016** Engineering Professional Practice Exam  
University of Padova, Padova, Italy
- 2013-2016** M.Sc. in Automation Engineering, with the mark 110/110 cum laude  
University of Padova, Padova, Italy, 2016.
- 2010-2013** B.Sc. in Information Engineering, with the mark 102/110  
University of Padova, Padova, Italy, 2013.

## Experience

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- 2021-present** Postdoctoral Researcher  
Division of Decision and Control Systems (EECS)  
KTH Royal Institute of Technology, Stockholm, Sweden
- 2016-2021** Ph.D. Student in Automatic Control  
Division of Automatic Control, Department of Electrical Engineering  
Linköping University, Linköping, Sweden

## Teaching Experience

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The following teaching experience is from Linköping University.

- **Teaching assistant**
  - Automatic Control (“Reglerteknik”): 7 times (2016-2020).
  - Automatic Control, Advanced Course (“Reglerteknik, fortsättningskurs”): 4 times (2017-2020).
- **Lab assistant**
  - Automatic Control: 6 times (2016-2020).
  - Automatic Control, Advanced Course: 4 times (2016-2020).
- **Supervisor for M.Sc. Theses**
  - *Tracking of Pedestrians Using Multi-Target Tracking Methods with a Group Representation*, Jakob Jerrelind, 2020.
  - *Direct Lift Control of Fighter Aircraft*, Markus Åstrand and Philip Öhrn, 2019.
  - *Modelling and Identification of a RUAV*, Alaa Saeed and Mattias Mucherie, 2018.
  - *Modelling of Test Bench for Road Load Simulation*, Dennis Åberg Skender, 2017.

## Certificates

- Completion of the course *Becoming a teacher in Higher Education* - 6 credits, advanced course in university education.

## Publications

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### Ph.D. Dissertation

**A. Fontan**, *Collective decision-making on networked systems in presence of antagonistic interactions*, Linköping Studies in Science and Technology. Dissertations, No. 2166, 2021

### Manuscripts

M1 **A. Fontan** and C. Altafini, “Pseudoinverses of signed Laplacian matrices”, 2022

- M2 **A. Fontan**, L. Wang, Y. Hong, G. Shi, and C. Altafini, “Multi-agent consensus over time-invariant and time-varying signed digraphs via eventual positivity”, *arXiv:2203.04215*, 2022

### Journal papers

- J1 **A. Fontan** and C. Altafini, “The role of frustration in collective decision-making dynamical processes on multiagent signed networks”, *IEEE Transactions on Automatic Control*, to appear, 2021
- J2 **A. Fontan** and C. Altafini, “A signed network perspective on the government formation process in parliamentary democracies”, *Scientific Reports*, vol. 11 (5134), 2021
- J3 **A. Fontan**, G. Shi, X. Hu and C. Altafini, “Interval Consensus for Multiagent Networks”, *IEEE Transactions on Automatic Control*, vol. 65 (5), pp. 1855–1869, 2019
- J4 **A. Fontan** and C. Altafini, “Multiequilibria analysis for a class of collective decision-making networked systems”, *IEEE Transactions on Control of Network Systems*, vol. 5 (4), pp. 1931–1940, 2018

### Conference papers (peer-reviewed)

- C1 L. Wang, **A. Fontan**, Y. Hong, G. Shi, and C. Altafini, *Multi-agent consensus over signed graphs with switching topology*, 20th European Control Conference (ECC), London, UK, July 2022
- C2 **A. Fontan** and C. Altafini, *On the properties of Laplacian pseudoinverses*, 60th IEEE Conference on Decision and Control, Austin, Texas, USA, December 2021
- C3 **A. Fontan** and C. Altafini, *Describing government formation processes through collective multiagent dynamics on signed networks* (extended abstract), 1st Virtual IFAC World Congress, July 2020
- C4 **A. Fontan** and C. Altafini, *Achieving a decision in antagonistic multiagent networks: frustration determines commitment strength*, 57th IEEE Conference on Decision and Control, Miami Beach, FL, USA, December 2018
- C5 **A. Fontan** and C. Altafini, *Modeling wireless power transfer in a network of smart devices*, Proceedings of the 2018 European Control Conference, Cyprus, 2018
- C6 **A. Fontan** and C. Altafini, *Investigating mixed-sign equilibria for nonlinear collective decision-making systems*, 56th IEEE Conference on Decision and Control, Melbourne, Australia, December 2017
- C7 **A. Fontan**, G. Shi, X. Hu and C. Altafini, *Interval Consensus: a novel class of constrained consensus problems for multiagent networks*, 56th IEEE Conference on Decision and Control, Melbourne, Australia, December 2017

### Conference Presentations

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- P1 *On behavioral changes for connected individuals: a networked dynamic decision-making approach*, Swedish Control Meeting (“Reglermöte”), Stockholm, Sweden, June 2022
- P2 *On the properties of Laplacian pseudoinverses*, 60th IEEE Conference on Decision and Control, Austin, Texas, USA, December 2021 (virtual conference)
- P3 *Describing government formation processes through collective multiagent dynamics on signed networks*, 1st Virtual IFAC World Congress, July 2020
- P4 *Signed parliamentary networks: how frustration affects the government formation in parliamentary democracies*, The 8th International Conference on Complex Networks and their Applications, Lisbon, Portugal, December 2019
- P5 *Decision Making in Presence of Frustration on Multiagent Antagonistic Networks*, SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, USA, May 2019
- P6 *Achieving a decision in antagonistic multiagent networks: frustration determines commitment strength*, 57th IEEE Conference on Decision and Control, Miami Beach, FL, USA, December 2018
- P7 *Collective decision-making in multiagent networks*, Swedish Control Meeting (“Reglermöte”), Stockholm, Sweden, June 2018
- P8 *Investigating mixed-sign equilibria for nonlinear collective decision-making systems*, 56th IEEE Conference on Decision and Control, Melbourne, Australia, December 2017

### Other

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- The research on government formation processes in parliamentary democracies (see paper J2) has been given attention on the LiU university’s homepage, see <https://liu.se/en/news-item/hur-lang-tid-tar-det-att-bilda-regering-efter-ett-val>.

- Visiting Scholar, *Thematic semester on Network Dynamics and Resilience*. Department of Mathematical Sciences, Politecnico di Torino, Italy, Oct. 20 - Nov. 10, 2019.

## Honors

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- Certificate of Outstanding Service as Reviewer of the IEEE Control Systems Letters for the year 2019.
- Nominated for the pedagogical prize *Gyllene Skiftnyckeln* by the mechanical engineering students at Linköping University, 2020.
- Nominated for the pedagogical prize *Gyllene moroten* by the mechanical engineering students at Linköping University, 2017.