Pol Mestres

PHD STUDENT · SYSTEMS AND CONTROL

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Education

University of California, San Diego   *La Jolla, California, USA*
PHD MECHANICAL ENGINEERING   *09 2020 - present*
- Advisor: Dr. Jorge Cortés
- Research topics: safety-critical control, optimization-based controllers, epidemic spreading

University of California, San Diego   *La Jolla, California, USA*
MS MECHANICAL ENGINEERING   *09 2020 - 07 2021*
- GPA: 3.966.
- Specialization in Dynamical Systems and Control
- Coursework: Linear Systems, Parametric Identification, Cooperative Control of Multiagent Systems, Nonlinear Systems, Optimal Estimation, Convex Optimization, Nonlinear Control, Linear Control Design, Optimal Control, Hybrid Systems.

Universitat Politècnica de Catalunya   *Barcelona, Spain*
BS MATHEMATICS, BS ENGINEERING PHYSICS   *09 2015 - 06 2020*
- 8.34/10 (Mathematics)
- 8.25/10 (Engineering Physics)
- Bachelor's Thesis at the University of California, San Diego, (10/10 with honors).

Publications

JOURNAL PUBLICATIONS

3.- P. Mestres and J. Cortés. Feasibility and Regularity Analysis of Safe Stabilizing Controllers under Uncertainty. IEEE Control Systems Letters, submitted

2.- P. Mestres and J. Cortés. Optimization-Based Safe Stabilizing Feedback with Guaranteed Region of Attraction. IEEE Control Systems Letters (with joint submission to 61st IEEE Conference on Decision and Control), 7 (2023), 367-372.

1.- M. Vaquero, P. Mestres, J. Cortés. Resource-Aware Discretization of Accelerated Optimization Flows. IEEE Transactions on Automatic Control, 68 (4) (2023).

CONFERENCE PUBLICATIONS

1.- P. Mestres, J. Cortés. 2023. Distributed and Anytime Algorithm for Network Optimization Problems with Separable Structure. Proceedings of the 62nd IEEE Conference on Decision and Control, Singapore, to appear.

1.- P. Mestres, J. Cortés. 2022. Safe Design for Controlling Epidemic Spreading under Heterogeneous Testing Capabilities. Proceedings of the American Control Conference, Atlanta, Georgia, 2022, pp. 697-702 .

Professional Experience

U.S. Army DEVCOM Army Research Laboratory *Adelphi, Maryland*
RESEARCH INTERN *06 2023 - 09 2023*

- ROS implementation of safe navigation algorithms for multi-agent systems. The algorithm was tested in simulation and in real robotic platforms, like Clearpath Jackals and Husky robots.

Barcelona Supercomputing Center - Computational Biology Group *Barcelona, Spain*
RESEARCH INTERN *06 2019 - 08 2019*

- Data Science project in epigenetics. The aim of the project was to reconstruct a certain cell differentation tree by using epigenetic data: hi-c chromatine contacts, histone marks data, etc.

BaseTIS *Barcelona, Spain*
DATA SCIENCE INTERN *06 2018 - 08 2018*

- Machine Learning project on attrition (predicting whether a given employee will leave a company).
- Deep Learning project on image classification for an olive oil company.

Institut de Robòtica Industrial (IRI) *Barcelona, Spain*
RESEARCH INTERN *06 2017 - 08 2017*

- Worked on a project called "Detecting variable symmetries on continuous domains".

Talks

December 2022. *Optimization-Based Safe Stabilizing Feedback with Guaranteed Region of Attraction*. Regular session at the 61st IEEE Conference on Decision and Control.

November 2022. *Optimization-Based Controllers for Safety-Critical Systems*. Robograds. UC San Diego.

June 2022. *Optimization-Based Safe Stabilizing Feedback with Guaranteed Region of Attraction*. Poster Session at the SoCal Hub Workshop on Secure Autonomy, University of California, Riverside, USA.

June 2022. *Safe Policy Design for Controlling Epidemic Spreading under Heterogeneous Testing Capabilities* Rapid Interactive Session at the 2022 American Control Conference, Atlanta, Georgia, USA.

Awards, Fellowships, & Grants

2020-2021	**MAE First Year Fellowship**, Department of Mechanical and Aerospace Engineering, UCSD
2015-2020	**CFIS Half Tuition and Housing Fellowship**, CFIS-UPC
2018	**Finalist - HackUPC**, Universitat Politècnica de Catalunya
2018	**Winner - Datathon CFIS**, Centre de Formació Interdisciplinària Superior (CFIS)
2015	**Excellence Distinction on the University Entrance Exam**, Generalitat de Catalunya
2015	**Silver Medal in Spanish Physics Olympiad**, Real Federación Española de Física
2015	**Silver Medal in Catalan Physics Olympiad**, Societat Catalana de Física

Outreach & Professional Development

PEER REVIEW

IEEE Transactions on Automatic Control
IEEE Conference on Decision and Control
Americal Control Conference

IEEE Transactions on Control of Network Systems
Automatica

Professional Memberships

IEEE Student Member
SIAM Student Member

Skills

Programming: Python, C++, MATLAB, R, AMPL, Mathematica.
Software: ROS, Linux, LaTeX, LabVIEW.
Languages: Catalan (native), Spanish (native), English (fluent), French (basic).