Antonio Franchi, PhD (HDR)

Associate Professor, University of Twente, The Netherlands — *Associate Researcher*, LAAS-CNRS, France

Web: http://homepages.laas.fr/afranchi/robotics/
Biblio: http://homepages.laas.fr/afranchi/robotics/publications_by_type,   Videos: http://homepages.laas.fr/afranchi/robotics/videos
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Curriculum Vitae

Place: Enschede, The Netherlands
Date: 9/12/2021

General Information

Full Name: Antonio FRANCHI
Citizenship: Italian
E-mail: a.franchi@utwente.nl
Spoken Languages: Italian, English, French

Bio

Antonio Franchi is an Associate Professor and the head of the Aerial and Swarm Robotics research line in the Robotics and Mechatronics lab at the University of Twente, The Netherlands; a Permanent Researcher 'en detachment' at the Centre National de la Recherche Scientifique (CNRS), France; and an associated researcher at LAAS-CNRS (RIS team), Toulouse, France. He is a IEEE Senior Member.

From 2014 to 2019 he was a Permanent Researcher at CNRS and the leader of the aerial robotics activities at LAAS-CNRS.

From 2010 to 2013 he was a Research Scientist and then a Senior Research Scientist at the Max Planck Institute for Biological Cybernetics in Germany, and the scientific leader of the group "Autonomous Robotics and Human Machine Systems". He received the Laurea (M.Sc.) degree (summa cum laude) in Electronic Engineering and the Ph.D. degree in System Engineering (Feb. 2010) from Sapienza University of Rome, Italy. In 2009 he was a visiting student at the University of California at Santa Barbara.

He received both the French and Italian Professorial Habilitation for Full-professorship (HDR and ASN resp.) from the National Polytechnic Institute of Toulouse and the Italian Ministry of University and Research in 2016 and 2018, respectively.

His main research interests lie in the robotics area, with a special regard to control and estimation problems and applications ranging across motion and physical interaction control, decentralized control/estimation/coordination, haptics, and hardware/software architectures. His main areas of expertise are aerial robotics and multiple-robot systems.

He published more than 150 papers in international journals, books, and conferences and gave more than 80 invited talks in international venues since 2010. In 2010 he was awarded with the "IEEE RAS ICYA Best Paper Award" for one of his works on Multi-robot Exploration. In 2018 he was a recipient of the 2018 IEEE RAS Most Active Technical Committee Award.

He was Associate Editor of the IEEE Transactions on Robotics from 2016 until 2021 and he is Senior Editor for IEEE ICRA (the largest and most influential robotics conference in the world) since 2020. He has been associate editor of the IEEE Robotics & Autom. Mag. (2013 to 2016), IEEE ICRA (2014 to 2019), IEEE/RSJ IROS (2014 to 2017) and the IEEE Aerospace and Electric Systems Magazine (2015).

He is the project coordinator of JCJC ANR MuRoPhen, co-coordinator of the FlyCrane project, and a was a contributor to PRO-ACT H2020, all focused on multi-robot coordination/manipulation.

He is the local coordinator of the EU H2020 Aerial-CORE project, he has been local coordinator in the EU H2020 AEROARMS project, the creator of the ANR PRC 'The Flying Co-worker' project, and he contributed to the EU FP7 ARCAS project, all focused on aerial robotic manipulation.

He is the co-founder and co-chair of the IEEE RAS Technical Committee on Multiple Robot Systems, http://multirobotsystems.org/ (>430 members). He co-funded and was the program co-chair of the IEEE-sponsored International Symposium on Multi-robot and Multi-agent Systems (MRS 2017 & 2019). He co-organized the IEEE-RAS-sponsored 2019 and 2016 Summer Schools on Multiple Robot Systems at NUS, Singapore and CTU, Prague, and more than 15 workshops on Multi-robot Systems, Aerial Robots and Teleoperation at IEEE ICRA, IEEE/RSJ IROS, and RSS, among others.

Since 2010, he advised 7 Postdoctoral fellows and 10 graduated PhD students, and he is currently mentoring 8 PhD candidates. In 2019 one of his mentored PhD thesis won three academic awards, among which the 1st place in the French National Award given to PhD theses in the field of Robotics.

Education and Degrees

**Aug.2017,Oct.2018:   Italian Professorial Habilitation: (ASN)
(for associate professor (2017) and then full professor (2018))**,
Italian Ministry of University and Research,
Committee: F. Caccavale, G. G. Calafiore, M. Di Bernardo, L. Gliemo, T. Parisini. **Sector:** 09/G1 - Automatic Control

Jun.2016:   French Professorial Habilitation (HDR) (for full professor),
Institut National Polytechnique de Toulouse (INPT),
Committee: A. Bicchi, R. D'Andrea, V. Kumar, J-P. Laumond, I. Fantoni, P. Morin, G. Oriolo, S. Lacroix,
Title: Methods for the Control of Mobile Robots with applications to Multi-robot systems, Shared control and Aerial Robotics

Nov.2006–Feb.2010:   PhD in System Engineering,
University of Rome "La Sapienza", **Advisor:** *Prof. Giuseppe Oriolo*,
Title: Decentralized Methods for Cooperative Task Execution in Multi-robot Systems

2007:   Habilitation of the Professional Association of Engineers
Italian: "Abilitazione alla Professione di Ingegnere"

2005:   Master Degree in Electronic Engineering,
University of Rome "La Sapienza", (Dur: 5 years), **Grade:** 110/110 cum laude, **Title:** Coordination and Communication Strategies for Multi-robot Exploration

Academic Record

From Dec.2019: Associate Professor at the University of Twente, The Netherlands, and **Associate Researcher** at LAAS-CNRS, France;

Jan.2014–Nov.2019:   Permanent Researcher (CR1) at CNRS (Centre National de la Recherche Scientifique). Member of: LAAS (Laboratoire d'Analyse et d'Architecture des Systèmes), Toulouse, France; **Guest Scientist** at Max-Planck Institute for Biological Cybernetics

Nov.2012–Jan.2014 Head of the Autonomous Robotics and Human Machine Systems group at Max-Planck Institute for Biological Cybernetics, Tübingen, Germany

Feb.2010–Nov.2012: Research Scientist, **associate leader of the Human-Robot Interaction Group** at Max-Planck Institute for Biological Cybernetics, Tübingen, Germany.

2009:   Visiting Scholar at University of California at Santa Barbara, CA, USA. Center for Control, Dynamical Systems, and Computation. Hosting Professor: *Francesco Bullo*

Work Experience outside Academia

2008   Hardware-Firmware developer at *Nergal embedded computing*

2006   Business consultant at *Accenture* (http://www.accenture.com)

Teaching Activity

Fall-2021   60h Class on "Control Engineering" at the University of Twente

Spring-2021   48h Class on "Control for UAVs" at the University of Twente

Fall-2020   60h Class on "Control Engineering" at the University of Twente

July-2019   3h Class on "Control of Cooperative Manipulation" at IEEE RAS Summer School on Multi-Robot Systems, Czech Technical university, Prague, Czech Republic

May-2019   18h Class on "Control of Multi-robot Systems" at Sapienza University of Rome, Rome, Italy

May-2018   24h Class on "Control of Multi-robot Systems" at Sapienza University of Rome, Rome, Italy

May-2017   20h Class on "Control of Multi-robot Systems" at Sapienza University of Rome, Rome, Italy

October-2016   10h Class on "Control and Estimation of Multi-robot and Aerial Systems" at Seoul National University, Seoul, South Korea

April-2016   20h Class on "Control of Multi-robot Systems" at Sapienza University of Rome, Rome, Italy

July-2015   4h Class on "Control of multiple robots via passivity and graph theory" at the 2015 SIDRA PhD Summer School on Robot Control, Bertinoro, Italy

June-2008   8h Class in "Control Problems in Multi-robot Systems". University of Rome "La Sapienza", Roma, Italy

Awards and Honors

Award 1st place:

– 2019 1st place French National PhD Robotics Prize, M. Tognon (advisor)

– 2019 Best PhD Thesis Award Aerospace Valley to M. Tognon (advisor)

– 2019 Best PhD Thesis in Engineering Sciences to M. Tognon (advisor) from the Toulouse Academy of Sciences, Inscriptions and Letters est. 1746

– 2018 IEEE RAS Most Active Technical Committee Award

– IEEE RAS Italian Chapter[†] Young Author Best Paper Award 2010
([†] "RAS Chapter of the year award" both in 2006 and 2009)

Award Finalist:

– 2021 AI 2000 Most Influential Scholars in the period 2011-2020 Honorable Mention by AIminer.org

– Finalist: Best Paper Award on Unmanned Aerial Vehicles at the IEEE 2021 ICRA Conference (Most important Robotics conference of the year, 4 finalists out of 2000 papers accepted and 4000 submitted)

– Finalist: IEEE RAS Italian Chapter Young Author Best Paper Award 2019 to G. Michieletto (senior co-author)

– Shortlisted: IEEE RAS Early Career Award 2017

– Finalist: Kuka Innovation Award 2017

Other honors:

– IEEE Senior Membership, 2016

– PhD scholarship in System Engineering, awarded by the Italian Ministry of Education, 2006

Funding and Projects

Large projects:

2020-2024   Originator/Particip., ANR Project 'CAMP', Tot. fund. 567K€

2019-2023   Principal Investigator of University of Twente in the H2020 EU Project 'Aerial-CORE' , Total funding: 8M€

2017-2021   Coordinator of the ANR Young Researcher (JCJC) Project 'MuRoPhen', Personal total funding 280K€

2019-2022   Originator and Principal Investigator of the ANR Project 'The Flying Co-worker', Total funding 620K€

2015-2019   Principal Investigator of LAAS-CNRS in the H2020 EU Project 'AeRoArms' , Total funding: 5M€

2019-2021   Part. of the PRO-ACT H2020 EU Project, Total funding: 4M€

2016-2019   Coll. @ FIRE-RS Intereg Sudoe Project, Total funding: 2.1M€

2014-2015   Part. @ ARCAS FP7 EU Project, CN 287617, Total: 6.15M€

Medium projects:

2019   Co-coordinator, "Fly Crane", Technology transfer project of the Toulouse Region, 120K€

2019   Coordinator of the MBZIRC competition team: 'LAAS-CNRS'

2018   3-year PhD student grant, "Ecole Doctorale Systèmes", 100K€

2017   Coordinator of the Kuka Innovation Award Project 'Tele-MAGMaS'

2014   3-year PhD student grant, "Ecole Doctorale Systèmes", 100K€

2013   EU FP7 Marie Curie Fellowship, 2 years Post-doc grant: "TRaVERSE", 162K€, FP7-PEOPLE-2013-IEF

2013   Research Training Group: Vision-based Flying Robots, 170K€, funded by the *University of Tübingen, Germany*

Small projects:

2016-2017   Carnot Institute Funding, 12 months post-doc grant, 60K€

2015   DFG research fellowship, 12 months post-doc grant, 50K€

2014   NSF Collaborative, Robotic Network, Univ. of Minnesota 50K$

2016   Eiffel excellence fellowship prog., 10mo visiting PhD grant, 30K€

2015   Eiffel excellence fellowship prog., 10mo visiting PhD grant, 30K€

2014   Eiffel excellence fellowship prog., 10mo visiting PhD grant, 30K€

2014 Programme 'nouveaux entrants', University of Toulouse, 10K€

2013 Hosting partner, 1 year PhD mobility grant; Inter-Polytechnical School, funded by the *Polytechnic of Turin/Milan/Bari, Italy*.

Areas of Technical Expertise

Main research area: *Robotics*

Main classes of problems: *Control, Estimation, Motion Planning*

Applications: *Aerial robots, Multi-robot systems, Human-robot interfaces*

Control: motion, physical interaction, decentralization

Estimation: parameter identification, localization, decentralization

Planning: exploration, coverage, monitoring, patrolling

Human-Robot interfaces: haptics, shared control

Robotics HW/SW: design of aerial robots, architectures for robotics

International Mobility

2018 *Vis. Researcher* (3 weeks) at University of Salento, Lecce

2018 *Vis. Professor* (5 weeks) at Sapienza University, Rome, Italy

2017 *Vis. Researcher* (1 week) at CTU-P, Prague, Czech Republic

2017 *Vis. Researcher* (5 weeks) at UZH and ETH, Zurich, Switzerland

2017 *Vis. Lecturer* (2 weeks) at Sapienza University, Rome, Italy

2016 *Vis. Lecturer* (2 weeks) at Seoul National University, Seoul, S. Korea

2016 *Vis. Lecturer* (1 week) at Chonnam Nation. Univ., Gwangju, S. Korea

2016 *Vis. Lecturer* (2 weeks) at Sapienza University, Rome, Italy

2010-13 *Researcher* (4 years) at Max Planck Institute, Tübingen, Germany

2009 *Vis. Student* (7 months) at Univ. of California at Santa Barbara, USA

Reviewer (External Expert) of Funded Projects

2021 METRICS, EU H2020: budget ∼2M€ (17 partners)

2021 ATLANTIS, EU H2020: budget ∼7M€ (10 partners)

Reviewer of Funding Proposals

2021 3 MIUR PRIN, Italy, Req. fund: ∼7x1.2M€

2021 FWO-SBO Belgium Req. fund: ∼200€

2021 ERC Advanced Grant, EU H2020, Req. fund: >2.5M€

2020 FRS-FNRS Belgium Req. fund: ∼800€

2020 Alexander von Humboldt-Professur, Germany , Req. fund: 5M€

2020 ERC Consolidator Grant, EU H2020, Req. fund: 2M€

2019 NNF, Denmark, Req. fund: ∼2M€

2019 SNSF, Switzerland, Req. fund: 400K CHF

2019 FRS-FNRS Belgium, Req. fund: ∼56K€

2018 SNSF Tech project, Switzerland, Req. fund: 400K CHF

2018 FRS-FNRS Belgium Req. fund: ∼450K€

2018 ERC Advanced Grant, EU H2020, Req. fund: >2.5M€

2017 2 FRS-FNRS Belgium Req. fund: ∼700K€

2017 EOS FNRS Belgium Req. fund: ∼2.8M€

2017 ERC Starting Grant, EU H2020, Req. fund: ∼1.5M€

2017 MIUR Montalcini, Italy, Req. fund: ∼100K€

2016 7 MIUR PRIN, Italy, Req. fund: ∼7x800K€

2014 SNSF Professorship, Switzerland, Req. fund: 1.5M CHF

2014 6 MIUR SIR, Italy, Stage 1. Req. fund: 6x800K€

Evaluator in panels for Funding Proposals

2019 H2020 ICT-09-2019-2020 Robotics Funding to be assigned: 42M€

2018 H2020-ICT-2018-2 Robotics-(DIH) Funding to be assigned: 64M€

Organizational Activity

Scientific society services

4) 2017 *Co-founder*: IEEE International Symposium on Multi-robot and Multi-agent Systems 2017

3) 2016 *Co-founder*: IEEE ICRA Best Paper Award on Multi-Robot Systems

2) 2014-today *Co-chair*: TC Multi-Robot Systems IEEE RAS (>410 memb.)

1) 2014 *Co-founder*: TC on Multi-Robot Systems IEEE RAS (>410 members)

http://multirobotsystems.org/?q=people

Workshops, demonstrations, and schools organization

18) *2018 2nd Workshop on Rigidity Theory for Multi-Agent Systems meets Parallel Robotics*, Nantes, France

17) *2017 GT-UAV (GDR-MACS/GDR-Robotique) special focus on Multi-Directional Thrust Aerial Vehicles*, Toulouse, France

16) *2017 IFAC-WC Work. on Rigidity Theory for MAS meets Parallel Robots: Towards the Discovery of Common Models and Methods*, Toulouse, France

15) *2017 IFAC World Congress GDR MACS School on Aerial Vehicles*, Toulouse, France

14) *2017 IEEE ICRA Workshop on Human Multi-Robot Systems Interaction*, Singapore

13) *2016 IEEE RAS Summer School on Multi-Robot Systems*, NUS, Singapore

12) *2016 IEEE ICRA Workshop on Fielded Multi-Robot Systems Operating on land, Sea, and Air*, Stockholm, Sweden

11) *2016 IEEE ICRA Workshop on Aerial Robotics Manipulation: from Simulation to Real-life*, Stockholm, Sweden

10) *2015 54th CDC Invited Session: Rigidity Theory for Problems in Multi-Agent Coordination*, Osaka, Japan

9) *2015 RSS Workshop on Principle of Multi-Robot Systems*, Rome, Italy

8) *2014 IEEE/RJS IROS Workshop on The Future of Multiple-robot Research and its Multiple Identities*, Chicago, IL, USA

7) *2014 IEEE ICRA Workshop: On the Centrality of Decentralization in Multi-robot Systems: Holy Grail or False Idol?*, Hong Kong, China

6) *2013 IEEE ICRA Demo on Bi-operator Haptic Control of Multiple UAVs with Connectivity Maintenance*, Karlsruhe, Germany

5) *2013 IEEE ICRA Technical Tour to the Max Plank Institutes in Tübingen*, Karlsruhe, Germany

4) *2013 IEEE ICRA Workshop: Towards Fully Decentralized Multi-Robot Systems: Hardware, Software and Integration*, Karlsruhe, Germany

3) *IEEE SMC 2012 Demo Event on Intercontinental Shared Control of Multiple UAVs*, Seoul, Korea

2) *(2012) 12th IAS Demo Event on Intercontinental Shared Control of Multiple UAVs*, Jeju Island, Korea

1) *2012 IEEE ICRA Workshop on Haptic Teleoperation of Mobile Robots: Theory, Applications and Perspectives*, St. Paul, MN, USA

Board Activity

27 PhD Boards:

2021 *PhD Jury/Rapporteur, Arda Yigit*, Universite de Strasbourg

2021 *PhD Jury/Rapporteur, Julian Erskine*, Ecole Centrale Nantes

2021 *PhD Jury/President, Jawhar Chebbi*, ISAE

2021 *PhD Jury, Christian Zammit*, TU Delft

2020 *PhD Jury, Sihao Sun*, TU Delft

2020 *PhD Jury, Ramy Rashad*, University of Twente

2020 *PhD Jury, Christos Verginis*, KTH Stockholm

2020 *PhD Jury/Rapporteur, Gabriele Nava*, University of Genoa/IIT

2020 *PhD Jury, Stefano Dafarra*, University of Genoa/IIT

2020 *PhD Jury, Yeshasvi Tirupachuri*, University of Genoa/IIT

2020 *PhD Jury/Rapporteur, Meiliwen Wu*, Milan Polytechnic

2020 *PhD Jury/Rapporteur, Mattia Giurato*, Milan Polytechnic

2019 *PhD Jury/Rapporteur, Mina Kamel*, UZH/ETH, Zurich

2018 *PhD Jury/Rapporteur, Brian Penin*, INRIA-Rennes

2018 *PhD Jury/Rapporteur, Duarte Dias*, EPFL/Lisbon Univ.

2018 *PhD Jury, Matthias Faessler*, UZH/ETH, Zurich

2017 *PhD Jury/Rapporteur, Jonatan Alvarez*, Univ. Grenoble, GipsaLab

2017 *PhD Rapporteur, Jose Luis Sanchez Lopez*, Univ. Politech. of Madrid

2017 *PhD Rapporteur, Elisabetta Cataldi*, Univ. of Cassino and LM

2017 *PhD Jury/Rapporteur, Burak Yüksel*, University of Stuttgart

2016 *PhD Jury/Rapporteur, Gian Maria Gasparri* at University of Pisa

2016 *PhD Jury/Rapporteur, Hamal Marino* at University of Pisa

2016 *PhD Jury/Rapporteur, Mirko Ferrati* at University of Pisa

2016 *PhD Jury/Rapporteur, Marco Todescato*, University of Pisa

2016 *PhD Jury/Rapporteur, Lorenzo de Stefani*, University of Padua

2016 *PhD Jury/Rapporteur, Roberto Bortoletto*, University of Padua

2016 *PhD Jury/Rapporteur, Andrea Carron*, University of Padua

12 International Conference Boards:
2021 *Editor in the Conference Editorial Board*: 2021 IEEE ICRA
2020 *Program co-chair*: 2020 IEEE ICUAS (Int. Conf on UAS)
2020 *Editor in the Conference Editorial Board*: 2020 IEEE ICRA
2017 *Program co-chair*: IEEE Int. Symp. on Multi-robot/agent Systems
2017 *Prog. Committee*: RSS 2017
2016 *Prog. Committee*: DEMUR'16
2015 *Prog. Committee*: IFAC IAV 2015, IFAC RED-UAS 2015
2014 *Prog. Committee*: ODMMRC Work., AAMAS 2015, Macorex, ECAI'14
2013 *Prog. Committee*: IFAC RED-UAS 2013

6 Jury Awards and Other Boards:
2020 *Jury Member*: of IEEE ICRA Best Paper Award on UAVs
2019 *Award chair*: 2nd IEEE Int. Symp. on Multi-robot/agent Systems
2018 *Jury Member*: of IEEE ICRA Best Paper Award on Multi-Robot Systems
2018 *Jury Member*: of IEEE ICRA Best Paper Award on UAVs
2017 *Award Chair*: of IEEE ICRA Best Paper Award on Multi-Robot Systems
2017 *Jury member* IEEE I-RAS Robotics made in Italy Video Contest

Editorial Activity

Resident Editor in Major Journals
2016-2020 *Associate Editor*, IEEE Transactions on Robotics
2013-2016 *Associate Editor*, IEEE Robotics & Autom. Magazine
2015-2016 *Associate Editor*, IEEE Aerospace and Electronic Systems Mag.

Guest Editor for Special Issues
2019 *Guest Editor*, Special Issue on "Multi-Robots and Multi-Agent Systems" at Autonomous Robots (Springer)
2016 *Guest Editor*, Special Issue on "Open source and widely disseminated robot hardware" at IEEE Robotics and Automation Magazine

Editor for Major Conferences
2020, 2021: *Editor in the Conference Editorial Board* for IEEE ICRA
2014, 2015, 2016, 2017, 2018, and 2019: *Associate Editor* for IEEE ICRA
2014, 2015, 2016, 2017, and 2019: *Associate Editor* for IEEE/RSJ IROS

Reviewer
IEEE Transaction on Robotics; *International Journal of Robotics Research*; IEEE Robotics and Automation Magazine; *Autonomous Robots*; Automatica; *System & Control Letters*; Robotica; *Robotic Autonomous Systems*; Transaction on Mechatronics; *Annals of Mathematics and Artificial Intelligence*; IET Control Theory & Applications; *IEEE Transactions on Control Systems Technology* Springer monographs; *Selected Reviewer at RSS*; IEEE ICRA; IEEE IROS; IEEE CDC; IEEE AIM; IEEE WHC; IFAC IAV; CCECE; ECAI, DARS; IFAC MVS; AIM; AAMAS;...

Mentoring

Graduated Advised PhDs: 10; Currently Advised PhDs: 8;
PostDocs/Research Engineers: 11;
Graduated Visiting PhDs: 10; Current Visiting PhD: 3
Total student projects advised (≥Master Level): >**50**

Advised PhD students:
−*Graduated*−
● 2021) Mahmoud Hamandi: *Effect of Actuation Properties of Multi-Rotor Aerial Vehicles on Their Abilities: Emphasis on Hoverability, Failure Robustness and Trajectory Tracking*, INSA Toulouse, LAAS-CNRS
● 2019) Davide Bicego: *Design and Control of Multi-Directional Thrust Multi-Rotor Aerial Vehicles with applications to Aerial Physical Interaction Tasks*, INSA Toulouse, LAAS-CNRS
● 2019) Quentin Delamare: *Algorithms for estimation and control for quadrotors in physical interaction with the environment*, University of Rennes, IRISA. Co-supervised with: P. Robuffo Giordano
● 2019) Victor Arreliano: *Design Optimization of Multirotors Using Evolutionary Algorithms* IPN, Mexico City. Co-supervised with: Emmanuel A. Merchán Cruz
● 2018) Marco Tognon: *Theory and Applications for Control and Motion Planning of Aerial Robots in Physical Interaction with particular focus on Tethered Aerial Vehicles*, INSA Toulouse, LAAS-CNRS. Co-supervised with: J. Cortés.

● 2017) Nicolas Staub: *Models, Algorithms and Architectures for Cooperative Manipulation with Aerial and Ground Robots*, UT 3 Paul Sabatier, LAAS-CNRS.
● 2016) Burak Yüksel: *Design, Modeling and Control of Aerial Robots for Physical Interaction and Manipulation*, University of Stuttgart. Co-advised with: F. Allgöwer and H. H. Bülthoff
● 2015) Antonio Petitti: *Theory and Applications of Consensus Protocols for Distributed Estimation Algorithms*, Polytechnic of Bari. Co-advised with: Alessandro Rizzo and Donato di Paola
● 2014) Carlo Masone: *Planning and Control for Robotic Tasks with a Human-in-the-Loop*, University of Stuttgart. Co-advised with: F. Allgöwer, H. H. Bülthoff, P. Robuffo Giordano, and C. Secchi.
● 2011) Paolo Stegagno: *Mutual localization from anonymous measurements in multi-robot systems*, Sapienza University of Rome. Co-advised with: G. Oriolo.

−*PhD Candidates*−
2021-ongoing) *H. Esmaeeli*: Aerial Inspection by Contact
   (co-sup. A. Mersha and S. Stramigioli)
2021-ongoing) *A. Srour*: Robust and Control-Aware Motion Planning
   (co-sup. P. Robuffo Giordano and Q. Delamare)
2020-ongoing) *A. Coelho*: Cable-suspended aerial systems
   (co-sup. C. Ott and K. Kondak)
2020-ongoing) *G. Corsini*: Aerial Co-workers *(co-sup. D. Sidobre)*
2020-ongoing) *A. Afifi*: Aerial Physical Human-robot Interaction
2020-ongoing) *Y. Aboudorra*: Multirotor control and aerodynamics
2019-ongoing) *M. Jacquet*: Computer Vision for Multi/Aerial-robots
2018-ongoing) *D. Sanalitro*: Cooperative Multi-agent Control

Advised Postdocs:
2021-ongoing) C. Gabellieri : *Deformable Aerial Manipulation*. University of Twente
2020-ongoing) D. Bicego : *Aerial Co-workers*. University of Twente
2019-ongoing) A-E. Jimenez Cano: *Outdoor Aerial Robotics*. LAAS-CNRS
2019-2020) H. Savino: *Cooperative Manipulation*, LAAS-CNRS
2018-2020)M. Tognon: *Heterogeneous Cooperative Robots*, LAAS-CNRS
2016-2017) M. Furci: *Aerial Robots with Input Saturation*, LAAS-CNRS
2014-2017) M. Ryll: *Aerial Robot Design and Control*, LAAS-CNRS
2013) P. Stegagno: *Vision-based navigation w/ aerial robots*, MPI-KYB

Advised Research Engineers:
2020-ongoing) H. Das: Software for Aerial Manipulation
2017-ongoing) Q. Sable: Design of Ultra-lightweight Manipulators
2017) H. Tello-Chavez: Motion Planning for Aerial Manipulators

Hosted and Collaborating PhD students from abroad:
2019-ongoing) Barbara Barros: Sapienza University of Rome
2017-ongoing) Viktor Walter: Czech Technical University
2017-ongoing) Chiara Gabellieri: University of Pisa
2019-2020) Enrica Rossi: *Distributed MPC over wireless for robotic manipulation*, 2020, University of Padua
2019-2020) Enrico Ferrentino: *Dynamic Programming for Optimal Planning and Control of Redundant Robot Manipulators*, 2020, University of Salerno
2019-2020) Gabriele Nava: *Instantaneous Momentum-Based Control of Floating Base Systems*, 2020, University of Genova/IIT.
2019-2020) Giuseppe Silano: *Software-in-the-loop methodologies for the analysis and control design of small UAV systems*, 2020, University of Sannio.
2019-2020) Mattia Giurato: *Design, integration and control of multirotor UAV platforms*, 2020, Polytechnic of Milan.
2016-2017) Elisabetta Cataldi: *Floating-base system arm equipped: kinematic dynamic control and planning* 2017, University of Cassino.
2015-2017) Giulia Michieletto: *Multi-Agent Systems in Smart Environments*, 2017, University of Padua.
2015-2017) Mostafa Mohammadi): *Bilateral Aerial Tele-Manipulation: Single and Multi-Robot Approaches*, 2017, University of Siena.

2015-2016) José-Luis. Sànchez López: *A General Architecture for Autonomous Navigation of Unmanned Aerial Systems*, 2017 Polytechnic University of Madrid.

2013-2017) Sujit Rajappa: *Towards Human-UAV Physical Interaction and Fully Actuated Aerial Vehicles*, 2017, University of Tübingen.

2013-2015) Sara Spedicato : Robust Tracking Control for Aerial Robots, University of Salento

Advised Master Student Final Projects
48) *Y. Avvari (M22)*: Aerial Robotics
47) *F. Sisavanh (M22)*: Aerial Robotics
46) *B. Bekooij (M22)*: Aerial Robotics
45) *M. Alonso-Calderon (M22)*: Perception
44) *B. Prakken (M22)*: Aerial Robotics
43) *A. Alharbat (M21)*: Aerial Robotics
42) *M. van Holland (M21)*: Aerial Robotics
41) *M. Kivits (M21)*: Perception
40) *B. Ganea (M21)*: Aerial Robotics
39) *B. Teja Chidura (M21)*: Aerial Robotics
38) *M. Bongertman (M20)*: Aerial Robotics
37) *M Rajavarman Mathivanan (M20)*: Aerial Robotics
36) *J. Zult (M20)*: Aerial Robotics
35) *V. Kodipaka (M20)*: Perception
34) *B. Singh Bal (M20)*: Aerial Robotics
33) *2019c E. Dantec (M20)*: Percepction
32) *G. Corsini (M20)*: Sensor-based MPC for Aerial Vehicles
31) *B. "Baljinder Singh Bal (M20)*: Multi-robot target tracking
30) *Ewen Dantec (M19)*: Aerial robotic computer vision
29) *E. Umili (M19)*: Motion Planning for Cooperative Manipulation
28) *A. Nader (M19)*: Control for Mobile Manipulation
27) *Y. Abou Dorra (M19)*: Design of Multidirectional-thrust vehicles
26) *G. Petrucci (M19)*: Onboard Sensing for Aerial Manipulation
25) *K. Sawant (M18)*: Omnipositive Aerial Vehicles
24) *F. Usai (M18)*: Complex Macro-mini Aerial Manipulators
23) *J. Mazzetto (M18)*: MPC for Generically Oriented Propeller Vehicles
22) *A. Dallolio (M18)*: Electro-aerodynamical Altitude Control
21) *H. Mohamed (M18)*: Rotor Grasping Omnidirectional
20) *Q. Sable (M17)*: Mechanical Design for Aerial-Ground Manipulation
19) *S. Mishra (M17)*: Optimal Control for Aerial-Ground Manipulation
18) *C. Gabellieri (M17)*: Decentralized Aerial Co-Manipulation
17) *D. Petard (M16)*: Cooperative Manipulation
16) *H. Telllo-Chavez (M16)*: Cooperative Aerial Transportation via Cables
15) *D. Bicego (M16)*: Fully-actuated aerial platforms
14) *E. Rossi (M16)*: Optimal Control for Tethered Aerial Robots
13) *A. Testa (M16)*: Control of Tethered Aerial Robots
12) *Y. Solana (M15)*: Motion Planning for Connectivity Maintenance
11) *G. Laure (M15)*: Visual Perception and Estimation for Aerial Robots
10) *S. Dash (M15)*: Tracking for UAV Tethered to a Platform
9) *M. Tognon (M14)*: Control of cm-scale UAVs
8) *N. Staub (M14)*: Identification for Multi-rotor Aerial Robots
7) *M. Gagliardi (M14)*: Vision-based cooperative UAV strategies
6) *M. Basile (M13)*: GPS-enabled UAV teleoperation
5) *T. Nestmeyer (M13)*: Exploration/connectivity maintenance
4) *R. Spica (M12)*: Optimal aerial grasping with a quadrotor UAV
4) *M. Riedel (M12)*: Middleware for human-in-the-loop
3) *M. Cognetti (M12)*: Bearing-based mutual localization in 3D
2) *M. Barbalinardo (M10)*: Exploration via continuous re-planning
1) *P. Stegagno (M09)*: Multi-robot Mutual localization

Advised Undergraduate Projects:
19) *S. Jauara*: Mechanical aerial design
18) *S. Wagh*: On-board vision estimation
18) *Q. Sable*: Design of a extra light-weight manipulator
17) *Y. Delmas*: Design of a light-weight manipulator
16) *D. Lucas*: Design of a fully actuated HexaRotor

15) *F. Botschen*: Autonomous aerial navigation
14) *S. Hartman*: Sensor-based aerial control
12,13) *A. Paolillo, L. Vallone*: IR-based line-following with a WMR
11) *F. Ferrante*: Reactive motion strategies for WMR
9,10) *S. M. Pelliccioni, F. Settembre*: Multi-robot PF localization
6,7,8) *C. Masone, M. Petrocchi, L. Rosa*: Calibration of a diff.-drive WMR
3,4,5) *E. Bitincka, F. Ramundo, M. Volpe*: Robotic-network deployment
1,2) *M. Paoletti, M. Sassano*: Multi-robot motion planning

Research Management
Manager of a unit of research:
Jan.2014-today <u>Founder and coordinator</u> of the **LAAS "Service Aerial Robotics" group** in the RIS team http://homepages.laas.fr/afranchi/robotics/?q=group-members-and-collab
     Quick cumulative numbers: 6 postdocs, 20 PhDs students (8 resident + 12 visiting), 2 engineers, 26 Master students, 8 Undergrads, 1 visiting professor, 2 visiting researchers, 1 senior CNRS engineer.
Nov.2012-Dec.2013 <u>Founder and head</u> of the **Autonomous Robotics and Human Machine Systems group** at Max-Planck Institute for Biological Cybernetics, Tübingen, Germany http://www.kyb.tuebingen.mpg.de/research/dep/bu/hri.html
     Quick numbers: 1 postdocs, 3 PhDs students, 4 Master students, 2 Undergrads.

Manager of technical or departmental activities:
Jan.2014-today <u>Founder and coordinator</u> of the *LAAS Aerial Robotics Testbed* (ART) https://wiki.laas.fr/robots/ART
     Quick numb.: $\geq$10 aerial vehicles built in-house, 4 advanced prototypes (O+7, holocopter, FAST-Hex, TiltHex, OTHex), 1 flying arena ($4\times6\times6$m), 1 rapid prototyping workshop.
Nov.2014-2018 <u>Founder, manager and promoter</u> of the *LAAS Weekly Robotics Meetings* (We-RoMe). About 90 seminars hosted since Nov. 2014 https://www.laas.fr/roboticsmeetings/
Jan.2014-today Coordinator of the open source *Telekyb3* software project for motion planning and low-level control of rotary-wing aerial robots https://git.openrobots.org/projects/telekyb3

Collaboration Network
– Center advanced Aerospace TEChnologies, Spain: (*Dr. A. Viguria-Imenez*)
– Czech Technical University in Prague, Czech Republic: (*Prof. M. Saska*)
– Chonnam National University, S. Korea: (*Prof. H. I. Son*)
– DLR German Space Agency, Germany: (*Dr. K Kondak and Christian Ott*)
– ENAC: (*Profs: M. Bronz, G. Hattenberger, M. Gorraz, A. Bustico*)
– ESIME-UA, Nat. Polytechnic Inst., Mexico City: (*Prof. E. A. Merchan-Cruz*)
– INRIA Nancy: (*DR Francois Charpillet, CR Serena Ivaldi*)
– IRISA Rennes (CNRS+INRIA): (*DR P. Robuffo Giordano*)
– Israel Institute of Technology, Israel: (*Prof. D. Zelazo*)
– LAAS-CNRS: (*Prof. D. Sidobre, DR Simon Lacroix, DR Juan Cortés*)
– Max Planck Institute, Germany: (*Prof. H. H. Bülthoff*)
– Polytechnic of Turin, Italy: (*Profs. A. Rizzo, M. Chiaberge*)
– Polytechnic of Milan, Italy: (*Prof. Marco Lovera*)
– Picardie University, Amiens: (*Prof. F. Morbidi*)
– Sapienza University of Rome, Italy: (*Prof. G. Oriolo*)
– Seoul National University, S. Korea: (*Prof. D. J. Lee*)
– Texas A&M University, USA: (*Prof. Dylan Shell*)
– University of Minnesota, USA: (*Prof. V. Isler*)
– Univ. of Modena and Reggio Emilia, Italy: (*Profs. C. Secchi, L. Sabattini*)
– University of Padua, Italy: (*Profs. R. Carli, A Cenedese , L. Schenato*)
– University of Siena, Italy: (*Prof. D. Prattichizzo*)
– University of Cassino and Southern Lazio, Italy: (*Prof. G. Antonelli*)
– University of Salento (now Bologna), Italy: (*Prof. G. Notarstefano*)
– University of Sannio, Italy: (*Prof. L. Iannelli*)
– University of Salerno, Italy: (*Prof. P. Chiacchio*)
– University of Pisa, Italy: (*Prof. L. Pallottino*)

– University of Seville, Spain: (*Profs. A. Ollero, G. Heredia*)
– University of California at Santa Barbara, USA: (*Prof. F. Bullo*)
– University of Stuttgart, Germany: (*Prof. F. Allgöwer*)
– UZH/ETH, Zurich, Switzerland: (*Prof. D. Scaramuzza*)

Software Development

4) 2014-today, **TeleKyb3**, *Role:* algorithm developer, coordinator: *Language:* C, *Place:* LAAS-CNRS,
Url: https://git.openrobots.org/projects/telekyb3

3) 2012-2014, **TeleKyb II**, *Role:* soft. engineer, coordinator, algorithm developer: *Language:* C++, *Place:* Max Planck Institute for Biol. Cybernetics,
Url: http://wiki.ros.org/telekyb

2) 2010-2012, **TeleKyb**, *Role:* soft. engineer and developer: *Language:* C++, *Place:* Max Planck Institute for Biol. Cybernetics,
Url: https://svn.tuebingen.mpg.de/humus-telekyb

1) 2008-2009, **MIP**: Multirobot integration platform, *Role:* soft. engineer and developer: *Language:* C++, *Place:* Sapienza University of Rome,
Url: http://www.dis.uniroma1.it/~labrob/software/MIP/
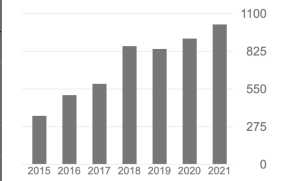
Publications/Talks Summary

Intern. Journals, Book Chapters, Conferences, and Talks

Category	Publis./Accept.
Referred Journal papers	**52**
Referred Book chapters	**7**
Referred Conference papers	**90**
Books	**1**
Invited Talks and Seminars	**75**

Published/Accepted Peer-reviewed International Journals

#	Journal
8	IEEE Transactions on Robotics*
8	The International Journal of Robotics Research (1 Sp. Issue)*
14	IEEE Robotics and Automation Letters (4 Special Issues)
3	Autonomous Robots
3	IEEE/ASME Transactions on Mechatronics (1 Spec. Issue)*
3	IEEE Robotics and Automation Magazine (3 Spec. Issues)
3	IEEE Transactions on Control of Network Systems
1	IEEE Trans. on Systems, Man, and Cybernetics, part B (Cybern.)
2	IEEE Transactions on Control Systems Technology
1	IEEE Control Systems Letters
1	Automatica
1	IEEE Access
1	Swarm Intelligence
2	Journal of Intelligent & Robotic Systems
1	Applied Sciences

Published/Accepted Peer-reviewed International Conferences

#	Conference
31	IEEE Int. Conf. on Robotics and Automation (ICRA)*
18	IEEE/RSJ Int. Conf. on Intelligent Robots and System (IROS)*
8	IEEE Conf. on Decision and Control (CDC)
2	Robotics: Science and Systems (RSS)*
4	EUCA/IEEE/IFAC European Control Conference (ECC)
5	IEEE Int. Conf. on Unmanned Aircraft Systems
2	IFAC Work. on Research, Educ. and Devel. of UAVs
2	Int. Conf. on Intelligent Autonomous Systems
18	Other IEEE and IFAC conferences

Google scholar (updated on Nov 22nd 2021)
https://scholar.google.com/citations?user=DqOnkE8AAAAJ

	All	Since 2015
Citations	6023	4772
h-index	48	43
i10-index	114	106

* IEEE ICRA, IEEE/RSJ IROS, RSS, and IEEE T-Ro, IJRR, IEEE/ASME T-Mech are widely recognized by the scientific community as the **3 top conferences** and the **3 top journals** in robotics. See, e.g., https://scholar.google.com/citations?view_op=top_venues&hl=en&vq=eng_robotics.

Scopus

Total Impact factor	
Total Citations	3758 (Scopus)
Average Citations per Product	3758/157 = 24 (Scopus)
Hirsch (H) index	35 (Scopus)
Normalized H index	35/11 = 3.2 (Scopus)

Selected Publications

1 'Modeling, control and design optimization for a fully-actuated hexarotor aerial vehicle with tilted propellers S Rajappa, M Ryll, HH Bulthoff, A Franchi 2015 IEEE international conference on robotics and automation (ICRA), 4006-4013' Cit:213 2015

2 'Shared control: Balancing autonomy and human assistance with a group of quadrotor UAVs A Franchi, C Secchi, M Ryll, HH Bulthoff, P Robuffo Giordano Robotics and Automation Magazine, IEEE 19 (3), 57-68' Cit:207 2012

3 'Bilateral teleoperation of groups of mobile robots with time-varying topology A Franchi, C Secchi, HI Son, HH Bulthoff, P Robuffo Giordano IEEE Transaction On Robotics 28 (5), 1019-1033' Cit:195 2012

4 'Semi-autonomous haptic teleoperation control architecture of multiple unmanned aerial vehicles DJ Lee, A Franchi, HI Son, HH Bülthoff, P Robuffo Giordano IEEE/ASME Trans. on Mechatronics' Cit:193 2013

5 'On cooperative patrolling: optimal trajectories, complexity analysis, and approximation algorithms F Pasqualetti, A Franchi, F Bullo IEEE Transaction On Robotics 28 (3), 592-606' Cit:181 2012

6 'Differential flatness of quadrotor dynamics subject to rotor drag for accurate tracking of high-speed trajectories M Faessler, A Franchi, D Scaramuzza IEEE Robotics and Automation Letters 3 (2), 620-626' Cit:143 2017

7 'A Passivity-Based Decentralized Strategy for Generalized Connectivity Maintenance P Robuffo Giordano, A Franchi, C Secchi, HH Bülthoff The International Journal of Robotics Research 32 (3), 299-323' Cit:135 2012

8 'Modeling and control of FAST-Hex: A fully-actuated by synchronized-tilting hexarotor M Ryll, D Bicego, A Franchi 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems, 1689-1694' Cit:129 2016

9 'Modeling and Control of UAV Bearing Formations with Bilateral High-level Steering A Franchi, C Masone, V Grabe, M Ryll, HH Bülthoff, P Robuffo Giordano The International Journal of Robotics Research 31 (12), 1504-1525' Cit:112 2012

10 'Adaptive trajectory tracking for quadrotor MAVs in presence of parameter uncertainties and external disturbances G Antonelli, E Cataldi, F Arrichiello, PR Giordano, S Chiaverini, A Franchi IEEE Transactions on Control Systems Technology 26 (1), 248-254' Cit:81 2017

11 'Full-pose tracking control for aerial robotic systems with laterally bounded input force A Franchi, R Carli, D Bicego, M Ryll IEEE Transactions on Robotics 34 (2), 534-541' Cit:55 2018

12 'Fundamental actuation properties of multirotors: Force-moment decoupling and fail-safe robustness G Michieletto, M Ryll, A Franchi IEEE Transactions on Robotics 34 (3), 702-715' Cit:54 2018

13 '6D interaction control with aerial robots: The flying end-effector paradigm M Ryll, G Muscio, F Pierri, E Cataldi, G Antonelli, F Caccavale, D Bicego, ... The International Journal of Robotics Research 38 (9), 1045-1062' Cit:48 2019

14 'Dynamics, control, and estimation for aerial robots tethered by cables or bars M Tognon, A Franchi IEEE Transactions on Robotics 33 (4), 834-845' Cit:45 2017

15 'Distributed estimation of state and parameters in multiagent cooperative load manipulation A Franchi, A Petitti, A Rizzo IEEE Transactions on Control of Network Systems 6 (2), 690-701' Cit:20 2018

16 'Hierarchical nonlinear control for multi-rotor asymptotic stabilization based on zero-moment direction G Michieletto, A Cenedese, L Zaccarian, A Franchi Automatica 117, 108991' Cit:1 2020