

Antonio Franchi, PhD (HDR)

Full Professor, University of Twente, The Netherlands – *Affiliated Researcher*, LAAS-CNRS, France

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Curriculum Vitae

Place: Enschede, The Netherlands

Date: 9/12/2021

General Information

Full Name: Antonio FRANCHI

Citizenship: Italian

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Spoken Languages: Italian, English, French

Bio



Antonio Franchi is a Full Professor in Aerial Robotic Control and head of the Aerial and Swarm Robotics research 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 affiliated researcher at LAAS-CNRS (RIS team), Toulouse, France. From 2014 to 2019 and from 2020 to 2021 he was a Permanent Researcher at CNRS and the leader of the aerial robotics activities at LAAS-CNRS and then Associate Professor at the University of Twente.

From 2010 to 2013 he was a Research Scientist and then a Senior Research Scientist at the Max Planck Institute for Biological Cybernetics, 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 is a IEEE Senior Member. 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 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 Multiple Robot 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 9 Postdoctoral fellows and 12 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 Jan. 2022 Full Professor** at the University of Twente, The Netherlands, and **Affiliated Researcher** at LAAS-CNRS, France;
- Dec.2019:Dec.2021 Associate Professor** at the University of Twente, The Netherlands, and **Affiliated 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 Alminer.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: ~200K€
 2021 ERC Advanced Grant, EU H2020, Req. fund: >2.5M€
 2020 FRS-FNRS Belgium Req. fund: ~800K€
 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

- 2021 HORIZON CL4-2021-HUMAN Funding to be assigned: 40M€
 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 and Advisory Activity

4 Post-PhD Boards and Mentoring duties:

- 2021-2025 *Tenure-Track Professorship Mentor*, Markus Ryll, TU Munich
 2021-2022 *Postdoc Mentoring Program*, Christina Kolb, U. Twente
 2021-2022 *Junior Professor Career Development*, Momen Abayazid, U. Twente
 2020-2021 *Junior Professor Career Development*, Françoise Siepel, U. Twente

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 Todeskato, 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:

2023 *Editor in the Conference Editorial Board*: 2023 IEEE ICRA
 2022 *Editor in the Conference Editorial Board*: 2022 IEEE ICRA
 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, 2022, 2023: *Editor in the Conf. 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

12 Graduated Advised PhDs;
 8 Currently Advised PhDs;
 12 PostDocs/Research Engineers advised
 13 Graduated Visiting PhDs hosted/informally advised;
 1 Current hosted/informally advised Visiting PhD;
 Total student projects advised (\geq Master Level): >50

Advised PhD students:

– **Graduated** –

- 2022) Martin Jacquet:
- 2022) Dario Sanalidro:

- 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. Bühlhoff
- 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. Bühlhoff, 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 –

- 2022-ongoing) A. Alharbat: *Optimization-based Control Aerial Robots* (co-sup. A. Mersha and C. Gabellieri)
- 2022-ongoing) Y. Shen: *Aerial Manipulation of Deformable Objects* (co-sup. C. Gabellieri)
- 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*

Advised Postdocs:

- 2022-ongoing) S. Sun : *Robust Control Aerial Systems*. University of Twente
- 2021-ongoing) C. Gabellieri : *Deformable Aerial Manipulation*. University of Twente
- 2020-ongoing) D. Bicego : *Aerial Co-workers*. University of Twente
- 2019-2022) 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:

- 2017-ongoing) Q. Sable: *Design of Ultra-lightweight Manipulators*
- 2020-2022) H. Das: *Software for Aerial Manipulation*
- 2017) H. Tello-Chavez: *Motion Planning for Aerial Manipulators*

Hosted and Collaborating PhD students from abroad:

- 2017-ongoing) Viktor Walter: *Czech Technical University*
- 2019-2022) Barbara Barros: *Real-Time Nonlinear Model Predictive Control for Motion Generation in Robotic Systems*, 2022, Sapienza University of Rome

2017-2021) Chiara Gabellieri: *The Role Of Interaction Forces In Robotic Manipulation For Logistics: A Special Focus On Depalletizing And Object Delivery*, 2021, 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. Sánchez 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

47) Y. Avvari (M22): Aerial Robotics
 46) F. Sisavanh (M22): Aerial Robotics
 45) B. Bekooij (M22): Aerial Robotics
 44) M. Alonso-Calderon (M22): Perception
 43) B. Prakken (M22): Aerial Robotics
 42) A. Alharbat (M21): Aerial Robotics
 41) M. van Holland (M21): Aerial Robotics
 40) M. Kivits (M21): Perception
 39) B. Ganea (M21): Aerial Robotics
 38) B. Teja Chidura (M21): Aerial Robotics
 37) M. Bongertman (M20): Aerial Robotics
 36) M Rajavarmam Mathivanan (M20): Aerial Robotics
 35) J. Zult (M20): Aerial Robotics
 34) V. Kodipaka (M20): Perception
 33) B. Singh Bal (M20): Aerial Robotics
 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. Mazetto (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. Tello-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.2019-**today** Head of the **LAAS "Aerial and Swarm Robotics" research line** in the RAM department
 Quick cumulative numbers: 2 postdocs, 4 PhDs students, 2 engineers, 13 Master students.
 Jan.2014-**today** Founder and coordinator of the **LAAS "Service Aerial Robotics" group** in the RIS team <http://homepages.laas.fr/afanchi/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 Founder and head 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 Founder and coordinator of the **LAAS Aerial Robotics Testbed (ART)** <https://wiki.laas.fr/robots/ART>
 Quick numb.: ≥ 10 aerial vehicles built in-house, 4 advanced prototypes (O+7, holocopter, FAST-Hex, TiltHex, OTHex), 1 flying arena ($4 \times 6 \times 6$ m), 1 rapid prototyping workshop.
 Nov.2014-2018 Founder, manager and promoter 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. Bühlhoff)
- 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.
Refereed Journal papers	57
Refereed Book chapters	7
Refereed Conference papers	94
Refereed Books	1
Invited Talks and Seminars	84

Published/Accepted Peer-reviewed International Journals	
#	Journal
9	IEEE Transactions on Robotics*
8	The International Journal of Robotics Research (1 Sp. Issue)*
16	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
2	IEEE Control Systems Letters
3	Journal of Intelligent & Robotic Systems
1	Automatica, Applied Sciences, IEEE Access, Swarm Intelligence

Published/Accepted Peer-reviewed International Conferences	
#	Conference
30	IEEE Int. Conf. on Robotics and Automation (ICRA)*
20	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)
6	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 Feb. 2022)
<https://scholar.google.com/citations?user=DqOnkE8AAAAA>

	All	Since 2017
Citations	6310	4543
h-index	50	41
i10-index	116	105

* 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 Bulthoff, 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 Bulthoff *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 Bulthoff, 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