Christos K. Verginis, PhD

Personal Data

Place and Date of Birth:	Athens, Greece	12 April 1989
Website:	Personal Website, Google Scholar,
Phone:	+46 704438285, +30 69 46851641
email:	christos.verginis@austin.utexas.edu, chrisverginis@gmail.com

Education

Nov. 2015 - May 2020
KTH Royal Institute of Technology, Stockholm, Sweden
Division of Decision and Control, School of Electrical Engineering and Computer Science
PhD (300 ECTS)
- Research Topic: Planning and Control of Multi-Robot Manipulator-Endowed Systems Under Temporal Logic Tasks
- Advisor: Prof. Dimos V. Dimarogonas, Co-Advisor: Prof. Danica Kragic

Sep 2019 - Dec 2019
Rice University, Houston, Texas, USA
Department of Computer Science
Research Visit at Rice University, Kavraki Lab
(Worked on integration of sampling-based motion planing algorithms and control design for collision-free planning of robotic manipulators)

Sep 2013 - Oct 2015
National Technical University of Athens, Athens, Greece
MSc (120 ECTS) in Automation Systems | Major: Automatic Control Systems and Robotics
- Thesis: "Distributed control protocols for vehicular platoons"
- Advisor: Prof. Kostas J. Kyriakopoulos
- Gpa: 9.60/10.0

Sep 2007 - Jul 2013
National Technical University of Athens, Athens, Greece
MEng (300 ECTS) in Electrical and Computer Engineering | Major: Electronics and Systems
- Thesis: "3D Plane Registration Using Uncertainties"
(conducted in the Institute of Automatic Control Engineering LSR of the Technical University of Munich)
- Advisor: Prof. Costas S. Tzafestas
- Gpa: 8.04/10.0 (47th OUT OF 343)

Sep 2012 - Mar 2013
Technical University of Munich, Munich, Germany
Exchange Semester at the Institute of Automatic Control Engineering (LSR), TUM

Professional Experience

Feb 2022 -
Uppsala University, Uppsala, Sweden
Division of Signals and Systems, Department of Electrical Engineering
Assistant Professor

Oct 2020 - Jan 2022
University of Texas at Austin, Austin, Texas, USA
Oden Institute for Computational Engineering and Sciences
Postdoctoral Research Associate
Research Supervisor: Prof. Ufuk Topcu

May 2020 - Oct 2020
KTH Royal Institute of Technology, Stockholm, Sweden
Division of Decision and Control, School of Electrical Engineering and Computer Science
Postdoctoral Research Associate
Research Supervisor: Prof. Dimos V. Dimarogonas

SEP 2013-JUN 2014	**Secondary Education Institute "C. Sofiadis"**, Athens, Greece
	- I tutored High School students in the courses of Physics and Chemistry and Senior High School students in the course of Chemistry.
AUG 2011 - JUN 2012	**Publishing Company "G. Fountas"**, Athens, Greece
	Participation in the translation from English to Greek of the scientific books:

- *"Robotics: Modeling, Planning and Control"* by Bruno Ciciliano, Lorenzo Sciavicco, Luigi Villani and Giuseppe Oriolo
- *"Discrete-Time Signal Processing"* by Alan V. Oppenheim and Ronald W. Schaffer

GRANTS AND AWARDS

2021	Recipient of the EECI PhD Award on Control for Complex and Heterogeneous Systems, 2021.
2021	Finalist for the euRobotics George Giralt PhD award 2021.
2019	Knut och Alice Wallenbergs travel grant for the IEEE International Conference on Robotics and Automation (ICRA), 2019.

RESEARCH INTERESTS

- Nonlinear dynamical systems (modeling, analysis, control)
- Multi-agent systems
- Uncertain Systems
- Multi-robot coordination
- Data-Driven Control
- Robust and Adaptive Control
- Reinforcement Learning

PUBLICATIONS

Journal Publications

20. *C. K. Verginis, C. Koprulu, S. Chinchali, and U. Topcu, "Joint Learning of Reward Machines and Policies in Environments with Partially Known Semantics", Under review.*

19. *C. K. Verginis, Y. Kantaros, and D. V. Dimarogonas, "Planning and Control of Multi-Robot-Object Systems under Temporal Logic Tasks and Uncertain Dynamics", Under review.*

18. *M. Swelia, C. K. Verginis, and D. V. Dimarogonas, "Cooperative Object Manipulation under Signal Temporal Logic Tasks and Uncertain Dynamics", Under review.*

17. *C. K. Verginis, Z. Xu, and U. Topcu, "Non-Parametric Neuro-Adaptive Formation Control", Under review.*

16. *C. K. Verginis, Z. Xu, and U. Topcu, "Non-Parametric Neuro-Adaptive Control", Under review.*

15. *C. K. Verginis, F.Djeumou, and U. Topcu, "Safety-Constrained Learning and Control using Scarce Data and Reciprocal Barriers", under Review.*

14. *C. K. Verginis, D. V. Dimarogonas, and L. E. Kavraki "KDF: Kinodynamic Motion Planning via Geometric Sampling-based Algorithms and Funnel Control", under Review.*

13. *Y. Savas, C. K. Verginis, M. Hibbard, and U. Topcu "On Minimizing Total Discounted Cost in MPDs Subject To Reachability Constraints", IEEE Transactions on Automatic Control, conditionally accepted.*

12. M. Logothetis, G. C. Karras, K. Alevizos, C. K. Verginis, P. Roque, K. Roditakis, A. Makris, S. Garcia, P. Schillinger, A Di Fava, P. Pelliccione, A. Argyros, K. J. Kyriakopoulos, and D. V. Dimarogonas, *"A Decentralized Framework for Efficient Cooperation of Heterogeneous Robotic Agents", IEEE Robotics and Automation Magazine (RAM) 2021.*
   Experimental Results

11. C. K. Verginis, C. P. Bechlioulis, and A. Soldatos *"Robust Trajectory Tracking Control for Uncertain* 3-*DOF Helicopters with Prescribed Performance", IEEE Transactions on Mechatronics.*
   Experimental Results

10. C. K. Verginis, D. Zelazo, and D. V. Dimarogonas, *"Cooperative Manipulation via Internal Force Regulation: A Rigidity Theory Perspective", IEEE Transactions on Control of Network Systems, conditionally accepted.*
   Simulation Results

9. A. Nikou, C. K. Verginis, and D. V. Dimarogonas, *"A Robust Nonlinear MPC Framework for Control of Underwater Vehicle Manipulator Systems under High-Level Tasks", IET Control and Applications 2021.*

8. C. K. Verginis and D. V. Dimarogonas, *"Adaptive Robot Navigation with Collision Avoidance Subject to 2nd-order Uncertain Dynamics", Automatica, 2021.*
   Simulation Results

7. C. K. Verginis and D. V. Dimarogonas, *"Asymptotic Tracking of Nonsmooth Feedback Stabilizable Unknown Systems with Prescribed Transient Response", IEEE Transactions on Automatic Control, 2021.*

6. C. K. Verginis and D. V. Dimarogonas, *"Closed-Form Barrier Functions for Multi-Agent Ellipsoidal Systems With Uncertain Lagrangian Dynamics", IEEE Control Systems Letters, 2019.*
   Simulation Results

5. C. K. Verginis, M. Mastellaro, and D. V. Dimarogonas, *"Robust Cooperative Manipulation Without Force/Torque Measurements: Control Design and Experiments", IEEE Transactions on Control Systems Technology, 2019.*
   Simulation/Experimental Results

4. C. K. Verginis, A. Nikou, and D. V. Dimarogonas, *"Robust Formation Control in SE(3) for Tree-Graph Structures with Prescribed Transient and Steady State Performance", Automatica, 2019.*
   Simulation/Experimental Results

3. C. K. Verginis and D. V. Dimarogonas, *"Timed abstractions for distributed cooperative manipulation", Autonomous Robots, 2018.*
   Simulation Results

2. C. K. Verginis, Ch. P. Bechlioulis, D. V. Dimarogonas, and K. J. Kyriakopoulos, *"Robust Distributed Control Protocols for Large Vehicular Platoons with Prescribed Transient and Steady State Performance", IEEE Transactions on Control Systems Technology, 2018.*
   Experimental Results

1. S. Khan, A. Dometios, C. Verginis, C. Tzafestas, D. Wohllerr, M. Buss, *"RMAP: A Rectangular Cuboid Approximation Framework for 3D Environment Mapping", Autonomous Robots, 2014.*

Conference Publications

33. H. Yin, C. K. Verginis, and D. Kragic, *"Consensus-based Normalizing-Flow Control: A Case Study in Learning Dual-Arm Coordination", under review.*

32. M. Swelia, C. K. Verginis, and D. V. Dimarogonas, *"Cooperative Sampling-Based Motion Planning under Signal Temporal Logic Specifications", under review.*

31. D. Lapandic, C. K. Verginis, D. V. Dimarogonas, and B. Wahlberg, *"Robust Trajectory Tracking for Underactuated Quadrotors with Prescribed Performance", under review.*

30. A. Nikou, C. K. Verginis and S. Heshmati-Alamdari, *"An Aperiodic Prescribed Performance Control Scheme for Uncertain Nonlinear Systems", To appear in the Mediterranean Conference on Control and Automation (MED), 2022.*

29. C. K. Verginis, Z. Xu, and U. Topcu, *"Non-Parametric Neuro-Adaptive Coordination of Multi-Agent Systems", to appear in the International Conference on Autonomous Agents and Multi-Agent Systems, 2022.*

28. Y. Savas, C. K. Verginis, and U. Topcu, *"Deceptive Decision-Making under Uncertainty", AAAI Conference on Artificial Intelligence, 2022.*

27. C. Neary, C. K. Verginis, M. Cubuktepe, and U. Topcu, *"Verifiable and Compositional Reinforcement Learning Systems", International Conference on Automated Planning and Scheduling (ICAPS), 2022.*

26. C. K. Verginis, D. V. Dimarogonas, and L. Kavraki, *"Sampling-based Motion Planning for Uncertain Nonlinear Systems via Funnel Control", ICRA Workshop on Safe Robot Control with Learned Motion and Environment Models, 2021.*

25. C. K. Verginis, F. Djeumou, and U. Topcu, *"Learning-Based Safety Control for Unknown Nonlinear Systems from Limited Data via Reciprocal Barriers", IEEE Conference on Decision and Control (CDC), 2021.*

24. F. Fotiadis, C. K. Verginis, K. Vamvoudakis, and U. Topcu, *"Assured Learning-Based Optimal Control subject to Timed Temporal Logic Constraints", IEEE Conference on Decision and Control (CDC), 2021.*

23. W. S. Cortez, C. K. Verginis, and D. V. Dimarogonas, *"Safe, Passive Control for Mechanical Systems with Application to Physical Human-Robot Interactions", IEEE International Conference on Robotics and Automation (ICRA), 2021.*
    Experimental Results

22. N. Lissandrini, C. K. Verginis, P. Roque, A. Cenedese, and D. V. Dimarogonas, *"Decentralized Nonlinear MPC for Robust Cooperative Manipulation by Heterogeneous Aerial-Ground Robots", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020.*
    Simulation/Experimental Results

21. T. Pan, C. K. Verginis, A. M. Wells, L. E. Kavraki, and D. V. Dimarogonas, *"Augmenting Control Policies with Motion Planning for Robust and Safe Multi-robot Navigation", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020.*

20. C. K. Verginis, D. V. Dimarogonas, and L. E. Kavraki, *"Sampling-based Motion Planning for Uncertain High-dimensional Systems via Adaptive Control", Workshop on the Algorithmic Foundations of Robotics (WAFR), 2021.*
    Simulation Results

19. C. K. Verginis, W. S. Cortez, and D. V. Dimarogonas, *"Adaptive Cooperative Manipulation with Rolling Contacts, American Control Conference (ACC), 2020.*

18. C. K. Verginis and D. V. Dimarogonas, *"Energy-Optimal Cooperative Manipulation via Provable Internal-Force Regulation", IEEE International Conference on Robotics and Automation (ICRA), 2020.*

17. C. K. Verginis and D. V. Dimarogonas, *"Asymptotic Stability of Uncertain Lagrangian Systems with Prescribed Transient Response", IEEE Conference on Decision and Control (CDC), 2019.*

16. C. K. Verginis and D. V. Dimarogonas, *"Adaptive Leader-Follower Coordination of Lagrangian Multi-Agent Systems under Transient Constraints", IEEE Conference on Decision and Control (CDC), 2019.*

15. C. K. Verginis, C. Vrohidis, C. P. Bechlioulis, K. J. Kyriakopoulos, and D. V. Dimarogonas, *"Reconfigurable Motion Planning and Control in Obstacle Cluttered Environments under Timed Temporal Tasks", IEEE Conference on Robotics and Automation (ICRA), 2019.*

14. C. K. Verginis, A. Nikou and D. V. Dimarogonas, *"Communication-based Decentralized Cooperative Object Transportation Using Nonlinear Model Predictive Control", European Control Conference (ECC), Limassol, 2018.*
    Experimental Results

13. *J. Wei, C. K. Verginis, J. Wu, D. V. Dimarogonas, H. Sandberg, and K. H. Johansson, "Asymptotic and finite-time almost global attitude tracking:representations free approach",* European Control Conference (ECC), 2018.

12. *L. Lindemann, C. K. Verginis, and D. V. Dimarogonas, "Prescribed Performance Control for Signal Temporal Logic Specifications",* IEEE Conference on Decision and Control (CDC), 2017.

11. *A. Nikou, S. Heshmati-Alamdari, C. K. Verginis, and D. V. Dimarogonas, "Decentralized Abstractions and Timed Constrained Planning of a General Class of Coupled Multi-Agent Systems",* IEEE Conference on Decision and Control (CDC), 2017.

10. *C. K. Verginis, A. Nikou, and D. V. Dimarogonas, "Position and Orientation Based Formation Control of Multiple Rigid Bodies with Collision Avoidance and Connectivity Maintenance",* IEEE Conference on Decision and Control (CDC), 2017.

9. *C. K. Verginis and D. V. Dimarogonas, "Robust Decentralized Abstractions for Multiple Mobile Manipulators",* IEEE Conference on Decision and Control (CDC), 2017.

8. *A. Nikou, C. K. Verginis, S. Heshmati-Alamdari, and D. V. Dimarogonas, "A Nonlinear Model Predictive Control Scheme for Cooperative Manipulation with Singularity and Collision Avoidance",* Mediterranean Conference on Control and Automation (MED), 2017.

7. *C. K. Verginis, and D. V. Dimarogonas, "Robust Quaternion-based Cooperative Manipulation without Force/Torque Information",* IFAC-PapersOnline, 2017.

6. *C. K. Verginis, and D. V. Dimarogonas, "Multi-Agent Motion Planning and Object Transportation under High Level Goals",* IFAC-PapersOnline, 2017.

5. *Alexandros Nikou, C. K. Verginis, and D. V. Dimarogonas, "Robust Distance-Based Formation Control of Multiple Rigid Bodies with Orientation Alignment",* IFAC-PapersOnline, 2017.

4. *C. K. Verginis, Ziwei Xu, and D. V. Dimarogonas, "Decentralized Motion Planning with Collision Avoidance for a Team of UAVs under High Level Goals",* Proceedings of the IEEE International Conference on Robotics and Automation (ICRA), 2017.
Simulation/Experimental Results

3. *C. K. Verginis, and D. V. Dimarogonas, "Distributed Cooperative Manipulation under Timed Temporal Specifications",* American Control Conference (ACC), s2017.

2. *C. K. Verginis, Ch. P. Bechlioulis, D. V. Dimarogonas, K. J. Kyriakopoulos, "Decentralized 2-D Control of Vehicular Platoons under Limited Visual Feedback",* IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2015.

1. *A. Tsiamis, C. K. Verginis, Ch. P. Bechlioulis, K. J. Kyriakopoulos, "Cooperative Manipulation Exploiting only Implicit Communication",* IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2015.

PROJECTS

- Co4Robots: Achieving Complex Collaborative Missions via Decentralized Control and Coordination of Interacting Robots

- AEROWORKS: Collaborative Aerial Workers

- Knut och Alice Wallenbergs Foundation IPSYS: Modeling and Control of Robotic Systems interacting with the environment

- RECONFIG: Cognitive, Decentralized Coordination of Heterogeneous Multi-Robot Systems via Reconfigurable Task Planning

Teaching

Nov 2015- Nov 2019	**KTH** *School of Electrical Engineering and Computer Science* - Teaching Assistant for the Undergraduate Course "Basic Control".
Nov 2015-Nov 2019	**KTH** *School of Electrical Engineering and Computer Science* - Teaching Assistant for the Postgraduate Course "Hybrid and Embedded Control Systems".
Nov 2015-Nov 2019	**KTH** *School of Electrical Engineering and Computer Science* - Supervision of Bachelor and Master Theses.
Sep 2008-Jul 2015	**Private Tutor**, Athens, Greece - I have been tutoring High School and Senior High School students in the courses of Mathematics, Geometry, Physics, Chemistry and Computer Programming. I have also tutored undegraduate students in the course of Automatic Control Systems.
Sep 2013-Jun 2014	**Secondary Education Institute "C. Sofiadis"**, Athens, Greece - I tutored High School students in the courses of Physics and Chemistry and Senior High School students in the course of Chemistry.

Supervision

- **PhD theses (co-supervisor)**

2020-Present	**Mayank Sewlia** (Co-supervision), KTH Royal Institute of Technology (main supervisor: Dimos Dimarogonas)
2020-Present	**Dzenan Lapandic** (Co-supervision), KTH Royal Institute of Technology (main supervisor: Bo Wahlberg)

- **Master theses (main supervisor)**

Sep 2019 - Sep 2020	**Akash Singh**, *"Platoon Coordination under Signal Temporal Logic Specifications"*, KTH Royal Institute of Technology (Examiner: Dimos Dimarogonas)
Jan 2019 - Sep 2019	**Cristina Escribano**, *"Leader-Follower Decentraliced Control of a Nanoquadrotor Swarm"*, KTH Royal Institute of Technology (Examiner: Dimos Dimarogonas)
Jan 2019 - Sep 2019	**Nicola Lissandrini**, *"Non-linear Model Predictive Control for Aerial-Ground Co-operative Robotics"*, KTH Royal Institute of Technology (Examiner: Dimos Dimarogonas)
Sep 2017 - May 2018	**Yu Wang**, *"Cooperative Transportation of Mobile Manipulators With Collision Avoidance"*, KTH Royal Institute of Technology (Examiner: Dimos Dimarogonas)
Jan 2017 - Jul 2017	**Imran Khan**, *"Decentralized Navigation of Multiple Quad-rotors using Model Predictive Control"*, KTH Royal Institute of Technology (Examiner: Dimos Dimarogonas)
Oct 2016 - Jan 2017	**Matteo Mastellaro**, *"Cooperative Manipulation without force/torque feedback: Control Design and Experiments"*, KTH Royal Institute of Technology (Examiner: Dimos Dimarogonas)
Jan 2016 - Jul 2016	**Ziwei Xu**, *"LTL Motion Planning with Collision Avoidance for A Team of Quadro-tors"*, KTH Royal Institute of Technology (Examiner: Dimos Dimarogonas)

- **Supervision of bachelor theses (main supervisor)**

Jan 2019 - Jun 2019	**Joakim Brisen and Joan Correa Silva**, *"Motion Planning and Control of Unmanned Aerial Vehicles"*, KTH Royal Institute of Technology (Examiner: Anita Kullen)
Jan 2018 - Jun 2018	**Vilhelm Dinevik and Paula Carbó**, *"Motion Planning and Control of Unmanned Aerial Vehicles"*, KTH Royal Institute of Technology (Examiner: Anita Kullen)
Jan 2017 - Jun 2017	**Johan Hedin and Idris Sahil**, *"Dynamic Motion Control of a Team of Quadrotor Aircraft Using the Potential Field Method"*, KTH Royal Institute of Technology (Examiner: Anita Kullen)
Jan 2016 - Jun 2016	**Daniel Kastensson Fan**, *"Cost-Benefit Models for Platooning"*, KTH Royal Institute of Technology (Examiner: Anita Kullen)

PROFESSIONAL ACTIVITIES

Chair and co-chair of conference sessions

May 2017	Chair of Session "Autonomous Agent", IEEE International Conference on Robotics and Automation (ICRA).

Reviewer/Referee of manuscripts

- IEEE Transactions on Automatic Control
- IEEE Transactions on Robotics
- IEEE Transactions on Control Systems Technology
- IEEE Transactions on Control of Network Systems
- IEEE Transactions
- IEEE Control Systems Letters
- IEEE Robotics and Automation Letters
- IEEE Transactions on Intelligent Transportation Systems
- IEEE Access
- IEEE Robotics and Automation Magazine
- IEEE Transactions on Aerospace and Electronic Systems
- IEEE Transactions on Automation Science and Engineering
- IEEE Transactions on Industrial Electronics
- IEEE Transactions on Cybernetics
- IEEE Transactions on Neural Networks and Learning Systems
- Autonomous Robots
- Automatica
- Robotics and Autonomous Systems
- ISA Transactions
- IET Control Theory & Applications
- Frontiers in Robotics and AI
- Nonlinear Dynamics
- International Journal of Robust and Nonlinear Control
- Swarm Intelligence
- IEEE Conference on Decision and Control
- American Control Conference
- European Control Conference
- Mediterranean Control Conference
- IEEE International Conference on Robotics and Automation
- IEEE/RSJ International Conference on Intelligent Robots and Systems
- IEEE International Conference on Automation Science and Engineering
- IEEE Conference on Control Technology and Applications
- International Symposium on Distributed Autonomous Robotic Systems

- International Conference on Control, Automation, Robotics and Vision
- IFAC World Congress
- International Symposium on Multi-Robot and Multi-Agent Systems
- IFAC Workshop on Networked Systems

ONLINE COURSE CERTIFICATES

APRIL 2015	*Advanced Engineering Systems in Motion: Dynamics of 3D Motion* by GeorgiaTech via coursera.org (Grade: 95%)
MARCH 2015	*Introduction to Astronomy* by Duke University via coursera.org (Grade: 99%)
DECEMBER 2014	*Underactuated Robotics* by MIT via edx.org (Grade: 99%)
JULY 2014	*Robot Mechanics and Control, Part II* by SNU via edx.org (Grade: 91%)
JULY 2014	*Autonomous Navigation for Flying Robots* by TUM via edx.org (Grade: 99%)
MAY 2014	*Robot Mechanics and Control, Part I* by SNU via edx.org (Grade: 96%)
MARCH 2014	*Control of Mobile Robots* by GeorgiaTech via coursera.org (Grade: 91.5%)
NOVEMBER 2013	*Foundations of Computer Graphics* by Berkeley via edx.org (Grade: 100%)
AUGUST 2013	*Discrete Optimization* by University of Melbourne via coursera.org (Grade: 73%)

SEMINARS-FURTHER EDUCATION

2014	Participation in the event "Researcher's Night 2014" which took place in the national center for scientific research "Demokritos" as a volunteer
2013	10-hour seminars in 2D Autocad
2013	"Plug into the Cloud with Oracle Database 12c: Built for the Cloud", Oracle Technology Day at Hellenic Motor Museum
2009	3rd National Congress of Students of Electrical Engineering and Computer "Young Engineers in the Knowledge Society" under the auspices of the Aristotle University of Thessaloniki

OCCUPATIONAL SKILLS

- *Analytical and Critical Thinking*
- *Organizational skills*
- *Excellent time management*
- *Open to travel and/or relocation*
- *Adaptive in Multicultural Environment*
- *Pro-active and positive attitude*
- *Dedication and commitment to goals*

LANGUAGES

ENGLISH:	Fluent (Proficiency)
GREEK:	Mother tongue
GERMAN:	Basic Knowledge (B2)
SPANISH:	Basic Knowledge (B2)
SWEDISH:	Basic Knowledge (B1)

COMPUTER SKILLS

Basic Knowledge:	JAVA, GITHUB, MATHEMATICA
Advanced Knowledge:	PYTHON, MATLAB, C, C++, V-REP, WEBOTS, ROS, LINUX,

INTERESTS AND ACTIVITIES

Technology, Cinema, Travelling, Books, Music, Puzzles, Sketching, Sports, Basketball, Martial Arts, Snowboarding, Volunteerism