Konstantinos Gatsis, PhD

Location: Oxford, UK
E-mail: kgatsis.ee@gmail.com
Web: https://kgatsis.github.io/
Phone: +44 7391 660191
LinkedIn: https://www.linkedin.com/in/konstantinos-gatsis-28009a140/
+1 (484) 557-6371
Google Scholar: link

SUMMARY

Experienced researcher and educator in engineering with specialization in control systems, optimization, and machine learning. Academic positions at University of Pennsylvania, USA, University of Oxford, UK, University of Southampton, UK. Research collaborations with engineering industry and with national security agencies. Proven track record of innovative publications with numerous best paper awards and 1300+ citations. Proven track record of grant funding.

SKILLS

- **Analytical** Deep knowledge of engineering mathematics: Optimization Algorithms, Machine Learning, Control Theory, Decision Making under Uncertainty, Stochastic Systems.
- **Communication** Developing and delivering lectures for university undergraduate and postgraduate courses. Over a decade of delivering presentations at international conferences, universities, and industry. Track record of publications (35 conference, 11 journals, 1200+ citations). Editorial work at conferences.
- **Research** Problem definition, research planning and literature overview. Proposal writing with a track record of secured funding (1.7M GBP project total, 300K GBP share). Project management for a team of PhD and undergraduate researchers.
- **Software** Coding (MATLAB), Version Control (Git), Manuscript preparation (LaTeX).
- **Leadership** People management for a team of PhD researchers, Mentoring and training in technical content and research skills, Recruitment of researchers, Workshop and Conference Organizer.

EXPERIENCE

Lecturer, **School of Electronics and Computer Science, University of Southampton, UK** **Jan.2024 - present**

- Leading research on Deep Learning (Neural ODEs), Deep Reinforcement Learning with Safety Constraints, Uncertainty Quantification for Reinforcement Learning.
- Managing project funded by UK national science funding agency (ESPRC) on the topic of efficient machine learning at the edge and neuromorphic computing.
- Developing teaching on electrical engineering, computer science, and AI. Supervising MSc students.

Lecturer, **Department of Engineering Science, University of Oxford, Oxford, UK** **Dec.2019 - Dec.2023**

- Led research on Deep Learning (Neural ODEs) for Dynamical System State Estimation, Federated Reinforcement Learning, Graph Neural Networks (GNNs) for Resource Allocation, Homomorphically Encrypted Optimization Algorithms.
- Led a research group of 4 doctoral students (I continue leading as a visiting academic).
- Collaboration with Siemens Digital Industries. Exploring the use of digital twins for data-driven control of connected automated vehicles.
- Developed and delivered teaching on engineering mathematics, signal processing, control theory and dynamical systems, decision making, dynamic programming, and reinforcement learning.
- Supervised 8 MEng (4th year undergraduate) student projects and other short projects.

Postdoctoral Researcher, **GRASP (General Robotics, Automation, Sensing and Perception) Laboratory, University of Pennsylvania, USA** **Oct.2016 - Oct.2019**

- Research on Statistical Machine Learning, Stochastic Gradient Descent for Resource Allocation Optimization, Stochastic State Estimation (Kalman filter) from Sensor Measurement with Security Guarantees, and Homomorphically Encrypted Quadratic Optimization Algorithms.
- Collaboration with Intel, Wireless Communications Research Lab on control systems over wireless networks. Co-design of control, communication, and learning for a Wi-Fi 6 access point in industrial control applications.

EDUCATION

- PhD in Electrical & Systems Engineering, University of Pennsylvania, USA 2016
- Diploma in Electrical & Computer Engineering, University of Patras, Greece 2010

HONORS & AWARDS

- **IEEE Communications Society & Information Theory Society Joint Paper Award** 2023
- **Best Student Paper Finalist (as co-author)**, 56th IEEE Conference on Decision and Control 2017
- **Young Author Prize Finalist (as co-author)**, IFAC World Congress 2017
- **Best Doctoral Dissertation Award (co-recipient)**, Electrical and Systems Engineering, University of Pennsylvania 2016
- **O. Hugo Schuck Best Paper Award (Theory)**, American Automatic Control Council 2014
- **Best Paper Award Finalist**, 5th International Conference on Cyber-Physical Systems 2014
- **Student Best Paper Award**, 2013 American Control Conference 2013

SELECTED RECENT PUBLICATIONS (Total Citation Count: 1300+, Google Scholar, June 2024)

[P-1] K. Miao and K. Gatsis. How deep do we need: Accelerating training and inference of neural ODEs via control perspective. In *International Conference on Machine Learning (ICML)*, 2024. To appear. Acceptance rate of 27.5%

[P-2] O. Bajgar, A. Abate, K. Gatsis, and M. Osborne. Walking the values in bayesian inverse reinforcement learning. In *40th Conference on Uncertainty in Artificial Intelligence (UAI)*, 2024. Spotlight presentation. To appear

[P-3] A. Bertolace, K. Margellos, and K. Gatsis. Homomorphically encrypted gradient descent algorithms for quadratic programming. In *62nd IEEE Conference on Decision and Control*, 2023

[P-4] O. Gates, M. Newton, and K. Gatsis. Scalable forward reachability analysis of multi-agent systems with neural network controllers. In *62nd IEEE Conference on Decision and Control*, 2023

[P-5] L. Zhao, K. Gatsis, and A. Papachristodoulou. Stable and safe reinforcement learning via a barrier-lyapunov actor-critic approach. In *62nd IEEE Conference on Decision and Control*, 2023

[P-6] K. Miao and K. Gatsis. Learning robust state observers using Neural ODEs. In *Learning for Dynamics and Control Conference (L4DC)*, 2023

[P-7] K. Gatsis. Federated reinforcement learning at the edge: Exploring the learning-communication tradeoff. In *European Control Conference (ECC)*, 2022

[P-8] K. Gatsis and G. J. Pappas. Statistical learning for analysis of networked control systems over unknown channels. *Automatica*, 125:109386, 2021

[P-9] A. B. Alexandru, K. Gatsis, Y. Shoukry, S. A. Seshia, P. Tabuada, and G. J. Pappas. Cloud-based quadratic optimization with partially homomorphic encryption. *IEEE Transactions on Automatic Control*, 66(5):2357–2364, 2021

[P-10] V. L. Silva, M. Eisen, K. Gatsis, and A. Ribeiro. Resource allocation in large-scale wireless control systems with graph neural networks. In *IFAC World Congress*, 2020

Full list at Google Scholar: link