Evangelos Chatzipantazis

PhD Student

CONTACT INFORMATION

- **Email**: vaghat@seas.upenn.edu
- Webpage / Google Scholars / LinkedIn / Twitter / Github

RESEARCH INTERESTS

Computer Vision, Robotics, Geometric Deep Learning, Equivariant representations, Optimization on Manifolds, Generative Models, Differential Geometry, AI for Science and Engineering

EDUCATION

University Of Pennsylvania (UPenn) **Sep 2018-**

- **PhD** in Computer and Information Science
  - Specialization: Geometric Deep Learning, Computer Vision
  - Advisor: Kostas Daniilidis
- **Master** in Statistics and Data Science (Wharton) **Jan 2023-**
  - **Current GPA**: 4.00/4.00
  - Relevant Coursework: Statistical Machine Learning, High-dimensional Statistics, Time-Series Forecasting, Stochastic Processes, Conformal Prediction
- **Master of Engineering** in Robotics (GRASP Laboratory) **Sep 2020- Dec 2022**
  - **GPA**: 4.00/4.00
  - Relevant Coursework: Convex Optimization, Learning in Robotics, Machine Perception, Advanced Machine Perception, Principles of Deep Learning, Theory of Computation

National Technical University of Athens (NTUA), Greece **Sep 2012- Sep 2018**

- **BSc & MSc** in Electrical and Computer Engineering (5-year joint degree; 300 ECTS)
  - **GPA**: 9.58/10.0 (top 1% among graduate class of 341 students; highest honors)
  - **Major GPA**: 9.64/10.0 (top 1%) Specialization: Computer Science
  - Relevant Coursework: Computer Vision, Stochastic Processes, Pattern Recognition, Deep Learning, Advanced Algorithms, Algorithmic Machine Learning, Spectral Graph Theory, Social Network Analysis
  - Undergraduate Thesis: *"Spectral Graph Methods with Applications in Computer Vision" (Greek)*
    Advisor: Petros Maragos

PUBLICATIONS

- Improving Equivariant Model Training via Constraint Relaxation, Stefanos Pertigkiozoglou*, Evangelos Chatzipantazis*, Shubhendu Trivedi, Kostas Daniilidis. NeurIPS **2024**.
- BiEquiFormer: Bi-Equivariant Representations for Global Point Cloud Registration. Stefanos Pertigkiozoglou*, Evangelos Chatzipantazis*, Kostas Daniilidis. (Under Review)
- Structural Risk Minimization for Learning Nonlinear Dynamics, Charis Stamouli, Evangelos Chatzipantazis, George J Pappas. ACC **2024**.
- SE(3)-Equivariant Attention Networks for Shape Reconstruction in Function Space, E.Chatzipantazis*, S.Pertigkiozoglou*, E.Dobriban, K.Daniilidis. ICLR **2023**.
- Graph Neural Networks for Multi-Robot Active Information Acquisition. M.Tzes, N.Bousias, E.Chatzipantazis, G.Pappas. **(Outstanding Paper Award in Multi-Robot Systems)** ICRA **2023**.
- Learning Augmentation Distributions Using Transformed Risk Minimization, E.Chatzipantazis*, S.Pertigkiozoglou*, K.Daniilidis, E.Dobriban. TMLR **2023**.
- Unsupervised Monocular Depth and Latent Structure, K.Chaney*, B.Bucher*, E.Chatzipantazis, J.Shi, K.Daniilidis. CVPR Workshop on 3D Scene Understanding for Vision, and Robotics **2019**.

PROFESSIONAL EXPERIENCE

▪ (Boston Dynamics) AI Institute

- ***Research Intern***. **Jun 2024-**

- Designed a novel policy learning algorithm for robotic manipulation tasks that exploits advanced perception representations to produce multimodal policies fast and robustly.

- *Supervisor*: Robert Platt, Robin Walters.

▪ University of Pennsylvania (Upenn)

- ***Graduate Research Assistant, GRASP Lab, UPenn***. **Sep 2018-**

- Conceptualized and implemented an equivariant attention-based neural network for point cloud reconstruction and improved the state-of-the-art by a large margin while achieving zero-shot generalization to real scenes.
- Conceptualized a mathematical framework for automatic discovery of symmetries in data and implemented a modular and efficient algorithm for recovering and applying useful augmentations while training large neural networks for vision tasks.
- Implemented a deep network for monocular depth estimation and fused it with IMU measurements using a MSCKF for vision and inertial odometry.

- *Supervisor*: Kostas Daniilidis

- ***Teaching Assistant CIS700: Advanced Topics in Geometric Deep Learning***, Spring **2024**

- Lecture on theoretical derivation and practical implementation of $SE(2), SE(3)$ steerable equivariant networks.

- *Professor*: Kostas Daniilidis, Jean Gallier

- ***Teaching Assistant CIS680: Advanced Machine Perception***, Spring **2019**

- Designed MaskRCNN implementation from scratch and curated COCO dataset.
- Website

- *Professor*: Jianbo Shi

- ***Teaching Assistant ESE546: Principles of Deep Learning***, Spring **2019, 2020**

- Co-authored course material in PAC-learning and Markov Chains.
- Class Notes

- *Professor*: Pratik Chaudhari

- ***Teaching Assistant ESE650: Learning in Robotics***, Fall **2019**

- Designed assignment on Partially Observable Markov Decision Processes (POMDP).

- *Professor*: Kostas Daniilidis

▪ National Technical University of Athens, **Sep 2017- Sep 2018**

- *Undergraduate Research Assistant, Computer Vision and Signal Processing (CVSP) Lab.*

- Scaled up spectral graph algorithms for image segmentation and extended previous methods by incorporating user-defined hard constraints.

- Supervisor: Petros Maragos

HONORS& AWARDS

- **Best Student Paper Award** ACC 2024.
  Paper: Structural Risk Minimization for Learning Nonlinear Dynamics
- **Outstanding Paper Award in Multi-Robot Systems** ICRA 2023.
  Paper: Graph Neural Networks for Multi-Robot Active Information Acquisition.
- **Gerondelis Foundation Graduate Scholarship** 2022.
  Awarded for academic excellence to support Ph.D. Studies.
- **Thomaideion Award** 2016, 2018.
  Awarded for highest grade among all students of Electrical and Computer Engineering in academic years 2015-2016 and 2017-2018.
- **Kritikos Award** 2017.
  Awarded for highest grade in all courses of Mathematics among fellow students for the academic year 2016-2017.
- **Papakyriakopoulos Award** 2016.
  Awarded for highest grade in all courses of Mathematics among fellow students for years 2015-2016.
- **"The Great Moment of Education" Eurobank EFG Award** 2012.
  Ranking 1st among fellow students in high school in the National Qualification Exams, 2012.

ACADEMIC SERVICE

- Organizer of IROS 2024 Workshop on *Equivariant Robotics: The Role of Symmetry Across Perception, Estimation, and Control* Website
- Invited Speaker in CVPR 2024 workshop on *Equivariant Vision: From Theory to Practice*: Talk on practical and theoretical aspects of equivariant deep learning. Slides
- Machine Learning Conference Reviewer: ICML 2022,2023,2024, NeurIPS 2022,2023,2024.
- Computer Vision Conference Reviewer: ICCV 2023.
- Robotics Conference Reviewer: ICRA 2023.

LANGUAGES

Greek: Native language. **English**: fluent. **French**: novice

TECHNICAL SKILLS

- **Programming Languages**
  - Current Frequent Use: Python
  - Past Frequent Use: C, C++, Java, Prolog, SMLNJ, MATLAB, HTML5, Javascript, PHP, mySQL
- **Other Programming Skills**
  - PyTorch, Parallel & GPU Programming , Github, LaTeX, Unix Kernel programming, bash scripting

OTHER INTERESTS

Competitive Swimming (7 years), Water Polo (3 years), Tennis (3 years), Guitar(self-taught)

REFERENCES (UPON REQUEST)

Kostas Daniilidis Ruth Yalom Stone Professor UPenn
Edgar Dobriban Associate Professor of Statistics and Data Science Wharton
Pratik Chaudhari Assistant Professor UPenn