# MARILIZA TZES

https://mtzes.github.io

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## **RESEARCH INTERESTS**

Semantic Planning, Learning in Robotics, Collaborative Robotics, Information Acquisition

### **EDUCATION**

<b>Ph.D., Electrical and Systems Engineering</b> GRASP Lab, University of Pennsylvania, United States Advisor: Dr. George J. Pappas	2018-Present
M.S.E. in Robotics	2018-2020
GRASP Lab, University of Pennsylvania, United States	
Integrated Master (B.Sc. & M.Eng.)	2013-2018
Electrical and Computer Engineering, University of Patras, Greece	
Thesis: Collaborative visual area coverage by unmanned aerial vehicles	
Advisors: Dr. Stamatios Manesis & Dr. Antony Tzes	
GPA: 9.02 out of 10, ranked 2nd in class	

## **RESEARCH, WORKING & TEACHING EXPERIENCE**

### Graduate Research Assistant, GRASP Lab, University of Pennsylvania 2018 - Present

- Developed a highly scalable, distributed, non-myopic, sampling-based planning method for multi-robot active information acquisition with asymptotical optimality guarantees and probabilistic completeness.
- Designed a hybrid control architecture to address mobile manipulation tasks under sensing and environmental uncertainty.
- Proposed the I-GBNet (Information-aware Graph Block Network), a highly-scalable, distributed algorithm for multi-robot information acquisition.
- Designed an optimal hierarchical task planning method for scene graph representations with Large Language Model guidance.

## Applied Scientist Intern, Amazon Robotics & AI

- Adapted state-of-the-art Computer Vision and Natural Language Processing methods (CLIP), to leverage plain text descriptions from the Amazon Catalog to improve item identification accuracy of a system used in Amazon Fulfilment Center.
- Applied improved methods for fusing information from text and images and outperformed existing methods and data sources currently in use.

#### Undergraduate Research Assistant, University of Patras

• Developed novel control schemes for the coverage of convex regions by teams of mobile aerial agents (MAAs) under positioning uncertainty.

## Teaching Assistant, University of Pennsylvania

ESE 617 - Non Linear Control Theory, ESE 619 - Model Predictive Control, ESE 500 - Linear Systems

#### Teaching Assistant, University of Patras

ECE411 - Signals and Systems I

2022

2016-2018

- Outstanding Paper Award in Multi-Robot Systems, ICRA 2023
- RAS Travel Grant for attending ICRA 2023 in London (2023)
- Dean's Fellowship from University of Pennsylvania for graduate studies (2018)
- Bruce Ford Memorial Fellowship for exceptional achievements among graduate students at University of Pennsylvania, Department of Electrical and Systems Engineering (2018)
- Award of Academic Excellence from LIMMAT Foundation (Switzerland) for being ranked 2nd at my graduation year August 2018 at University of Patras, School of Electrical and Computer Engineering (2018)

#### JOURNAL ARTICLES

J1. M. Tzes, S. Papatheodorou, A. Tzes: 'Visual Area Coverage by heterogeneous aerial agents under imprecise localization' in *IEEE Control Systems Letter*, vol. 2, no. 4, pp. 623-628, Oct. 2018.

### **CONFERENCE PAPERS**

- C8. Z. Dai, A. Asgharivaskasi, T. Duong, S. Lin, M. Tzes, G. Pappas, N. Atanasov: 'Optimal Scene Graph Planning with Large Language Model Guidance', in *ICRA 24*', Yokohama, Japan, May 2024
- C7. M. Tzes\*, N. Bousias\*, E. Chatzipantazis, G. Pappas: 'Graph Neural Networks for Multi-Robot Active Information Acquisition' in *ICRA 23*', London, United Kingdom, May 2023 (Outstanding Paper Award in Multi-Robot Systems)
- C6. M. Tzes, V. Vasilopoulos, Y. Kantaros, G. Pappas: 'Reactive Informative Planning for Mobile Manipulation Tasks under Sensing and Environmental Uncertainty' in *ICRA 22'*, Philadelphia, United States, May 2022
- C5. M. Tzes, Y. Kantaros, G. Pappas: 'Distributed Sampling-based Planning for Non-Myopic Active Information Gathering' in *IROS 21*', Prague, Czech Republic, September 2021
- C4. N. Bousias, S. Papatheodorou, M. Tzes, A. Tzes: 'Distributed surveillance by a swarm of UAVs operating under positional uncertainty' in ECESCON 11, Thessaloniki, Greece, April 2019
- C3. N. Bousias, S. Papatheodorou, M. Tzes, A. Tzes: Collaborative visual area coverage using aerial agents equipped with PTZ-cameras under localization uncertainty', in 18<sub>th</sub> European Control Conference (ECC), Naples, Italy, 2019, pp. 1079-1084.
- **C2.** M. Tzes, S. Papatheodorou, A. Tzes: 'Visual Area Coverage by heterogeneous aerial agents under imprecise localization' in *Control and Decisions Conference (CDC)*, Miami, United States, 2018 (appeared in *IEEE CSS-letter*)
- C1. M. Tzes, S. Papatheodorou, A. Tzes: 'Collaborative Visual Area Coverage by Aerial Agents Under Positioning Uncertainty,' in 26<sub>th</sub> Mediterranean Conference on Control and Automation (MED), Zadar, Croatia, June 2018, pp. 1-154.

#### SKILLS

Programming Technologies & Tools	Python, MATLAB, C++, LabVIEW ROS, PyTorch, Numpy, GPy, PyTorch Geometric, OpenAI Gym,
Languages	Linux, MS Office, Windows Greek (Native Language), English (Full Professional Proficiency), French (Elementary Proficiency: Delf B2)
Other	Piano Soloist (Diploma in piano, 2018)