Georgios Georgakis

July 21st 2025

NASA-Jet Propulsion Laboratory, Caltech
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Education

PhD in Computer Science 2013-2020
George Mason University
Research Interests: Computer Vision, Robotics, Machine Learning
Thesis: 3D Model-Assisted Learning for Object Detection and Pose Estimation [pdf]
Advisor: Prof. Jana Kosecka

MSc in Computer Science 2013-2015
George Mason University

Diploma in Electronic and Computer Engineering 2006-2012
Technical University of Crete
Thesis: Field Landmark Recognition and Localization for the RobotStadium Online Soccer Competition [pdf]
Advisor: Associate Prof. Michail G. Lagoudakis

Positions

Robotics Technologist Jan 2023-
NASA-Jet Propulsion Laboratory
California Institute of Technology

Postdoctoral Researcher Mar 2020-Jan 2023
GRASP Lab. Advised by Dr. Kostas Daniilidis
CIS Department, University of Pennsylvania

Part-time Lecturer Spring 2022
ESE Department, University of Pennsylvania

Graduate Research Assistant Aug 2013-Dec 2019
Computer Vision and Robotics Lab
CS Department, George Mason University

Research Intern Summer 2019
United Imaging Intelligence, Cambridge MA

Ph.D Research Intern - Vision and Deep Learning Summer 2017, 2018
Siemens Corporate Technology, Princeton NJ

Awards

Technology Spotlight Award, Autonomous Systems Division, Jet Propulsion Lab, May 2024

PI, *"Disentangling Jupiter's Complex Atmospheric Processes Through the Application of Machine Learning Methods to JunoCam Data"*
NASA Research Opportunities in Space and Earth Science (ROSES), 2023, $711K
Co-Is: University of Michigan, University of California, Berkeley

Doctoral Consortium at ICCV 2019

Outstanding Graduate Teaching Assistant Award by the Department of Computer Science, George Mason University, for the academic year 2015-16

Papers

Risk-Guided Diffusion: Toward Deploying Robot Foundation Models In Space, Where Failure Is Not An Option
R. Thakker, A. Patnaik, V. Kurtz, J. Frey, J. Becktor, S. Moon, R. Royce, M. Kaufmann, **G. Georgakis**, P. Roth, J. Burdick, M. Hutter, S. Khattak
RSS 2025 Workshop on Reliable Robotics: Safety and Security in the Face of Generative AI

General-Purpose Robotic Navigation via LVLM-Orchestrated Perception, Reasoning, and Acting
B. Lange, A. Yildiz, M. Arief, S. Khattak, M. Kochenderfer, **G. Georgakis**
arXiv:2506.17462

Vision-based Geo-Localization of Future Mars Rotorcraft in Challenging Illumination Conditions
D. Pisanti, R. Hewitt, R. Brockers, **G. Georgakis**
arXiv:2502.09795

Illumination Invariant Image Matching for Lunar TRN
N. Rothenberger, **G. Georgakis**, Y. Chen, A. Ansar
AIAA SciTech 2025

NAVCON: A Cognitively Inspired and Linguistically Grounded Corpus for Vision and Language Navigation
K. Wanchoo, X. Zuo, H. Gonzalez, S. Dan, **G. Georgakis**, D. Roth, K. Daniilidis, E. Miltsakaki
arXiv:2412.13026

Learning Illumination Invariant Features for Lunar South Pole with Deep Learning
G. Georgakis, A. Ansar
Space Imaging Workshop (SIW) 2024

Pixel to Elevation: Learning to Predict Elevation Maps at Long Range using Images for Autonomous Offroad Navigation
C. Chung, **G. Georgakis**, P. Spieler, C. Padgett, A. Agha, S. Khattak
IEEE Robotics and Automation Letters (RA-L) 2024

Icy Moon Surface Simulation and Stereo Depth Estimation for Sampling Autonomy
R. Bhaskara, **G. Georgakis**, J. Nash, M. Cameron, J. Bowkett, A. Ansar, M. Majji, P. Backes
IEEE Aerospace Conference (AeroConf) 2024

Unordered Navigation to Multiple Semantic Targets in Novel Environments
B. Bucher, K. Ashton, B. Wu, K. chmeckpeper, S. Goel, N. Matni, **G. Georgakis**, K. Daniilidis
Embodied AI Workshop at CVPR 2023

Bridge Data: Boosting Generalization of Robotic Skills with Cross-Domain Datasets
F. Ebert*, Y. Yang*, K. Schmeckpeper, B. Bucher, **G. Georgakis**, K. Daniilidis, C. Finn, S. Levine
Robotics: Science and Systems (RSS) 2022

Cross-modal Map Learning for Vision and Language Navigation
G. Georgakis, K. Schmeckpeper, K. Wanchoo, S. Dan, E. Miltsakaki, D. Roth, K. Daniilidis
IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2022

Learning to Map for Active Semantic Goal Navigation

G. Georgakis*, B. Bucher*, K. Schmeckpeper, S. Singh, K. Daniilidis
International Conference on Learning Representations (ICLR) 2022

Uncertainty-driven Planner for Exploration and Navigation
G. Georgakis, B. Bucher, A. Arapin, K. Schmeckpeper, N. Matni, K. Daniilidis
International Conference on Robotics and Automation (ICRA) 2022

Object-centric Video Prediction without Annotation
K. Schmeckpeper*, **G. Georgakis***, K. Daniilidis
International Conference on Robotics and Automation (ICRA) 2021

Hierarchical Kinematic Human Mesh Recovery
G. Georgakis*, R. Li*, S. Karanam, T. Chen, J. Kosecka, Z. Wu
European Conference on Computer Vision (ECCV) 2020

Robust Multi-modal 3D Patient Body Modeling
F. Yang, R. Li, **G. Georgakis**, S. Karanam, T. Chen, H. Ling, Z. Wu
Medical Image Computing and Computer Assisted Interventions (MICCAI) 2020

Towards Robust RGB-D Human Mesh Recovery
R. Li, C. Cai, **G. Georgakis**, S. Karanam, T. Chen, Z. Wu
arXiv:1911.07383

Simultaneous Mapping and Target Driven Navigation
G. Georgakis, Y. Li, J. Kosecka
arXiv:1911.07980

Learning Local RGB-to-CAD Correspondences for Object Pose Estimation
G. Georgakis, S. Karanam, Z. Wu, J. Kosecka
IEEE International Conference on Computer Vision (ICCV) 2019

End-to-end Learning for Keypoint Detection and Descriptor for Pose Invariant 3D Matching
G. Georgakis, S. Karanam, Z. Wu, J. Ernst, J. Kosecka
IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2018

Label Propagation in RGB-D Video
Md. A. Reza, H. Zheng, **G. Georgakis**, J. Kosecka
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2017

Synthesizing Training Data for Object Detection in Indoor Scenes
G. Georgakis, A. Mousavian, A. C. Berg, J. Kosecka
Robotics: Science and Systems (RSS) 2017

A Contact Exploitative Approach to the Amazon Robotics Challenge
E. Dessalene, **G. Georgakis**, Md. A. Reza, Y. Li, Y. Ovcharik, A. Shapiro, J. Kosecka, D. Lofaro
Warehouse Picking Automation Workshop (ICRA) 2017

Multiview RGB-D Dataset for Object Instance Detection
G. Georgakis, Md. A. Reza, A. Mousavian, P. H. Le, J. Kosecka
International Conference on 3D Vision (3DV), 2016

RGB-D Multiview Object Detection with Object Proposals and Shape Context
G. Georgakis, Md. A. Reza, J. Kosecka
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2016

* Denotes equal contribution

Patents Awarded/Pending

Method and System for On-board Localization
R. Brockers, F. Dietsche, J. Delaune, P. Proença, R. Hewitt, **G. Georgakis**
US18/312,444 filed May 2023, Application no. US20230360547A1

Systems and Methods for Human Pose and Mesh Recovery
Z. Wu, S. Karanam, C. Cai, **G. Georgakis**
US16/995,446, filed August 2020, Application no. US20210158028A1

Systems and Methods for Human Mesh Recovery
S. Karanam, Z. Wu, **G. Georgakis**
US16/863,382, filed April 2020, Application no. US20210158107A1

Learning Keypoints and Matching RGB Images to CAD Models
G. Georgakis, S. Karanam, Z. Wu, J. Ernst
PCT/US2019/053827, filed September 2019, Application no. WO2020086217

Matching RGB Images to CAD Models
G. Georgakis, S. Karanam, Z. Wu, J. Ernst
PCT/US2019/040913, filed July 2019, Application no. WO2020014170A1

Spare Part Identification Using a Locally Learned 3D Landmark Database
G. Georgakis, S. Karanam, Z. Wu, J. Ernst
PCT/US2018/049100, filed September 2018, Application no. WO2019094094A1

Learning View-invariant Local Patch Representations for Pose Estimation
G. Georgakis, S. Karanam, V. Manjunatha, K-C. Peng, Z. Wu, J. Ernst
PCT/US2018/013271, filed January 2018, Application no. WO2019139587A1

Training a Convolutional Neural Network using Task-irrelevant Data
V. Manjunatha, **G. Georgakis**, K-C. Peng, Z. Wu, J. Ernst
PCT/US2017/067766, filed December 2017, Application no. WO2019125453A1

Selected Talks

Learning Illumination Invariant Features for Lunar South Pole with Deep Learning
Space Imaging Workshop, Atlanta GA, October 2024

Vision-based Navigation in Novel Environments
Jet Propulsion Lab Section 347 Talks, Virtual, July 2022

Cross-modal Map Learning for Vision and Language Navigation
GRASP SFI Seminar Series, Philadelphia PA, April 2022

Uncertainty-based Mapping and Navigation
MURI Review Meeting, Virtual, October 2021

Object-centric Video Prediction without Annotation
Honda Curious Minded Machines Seminar Series, Virtual, January 2021

3D Model-Assisted Learning for Object Detection and Pose Estimation

GRASP Seminar Series, Philadelphia PA, December 2019

Keypoint Learning for Pose Estimation
Siemens CT Intern Talk Series, Princeton NJ, August 2018

Synthesizing Training Data for Object Detection in Indoor Scenes
RSS Conference Talk, Cambridge MA, July 2017

RGB-D Multiview Object Detection with Object Proposals and Shape Context
IROS Conference Talk, Daejeon, South Korea, October 2016

Teaching

***Instructor* at University of Pennsylvania**

ESE650: Learning in Robotics with Oleh Rybkin	Spring 2022

***Guest Lecturer* at George Mason University**

CS112: Introduction to Programming - Python	Fall 2015
CS685: Autonomous Robotics	Fall 2018
CS687: Advanced Artificial Intelligence	Spring 2019
CS747: Deep Learning	Spring 2020

***Graduate Teaching Assistant* at George Mason University**

CS112: Introduction to Programming - Python (Head TA)	Fall 2014 - Spring 2017
CS310: Data Structures - Java	Fall 2018
CS480: Introduction to Artificial Intelligence	Spring 2019

Mentoring

PhD Thesis Committee

- Tiberiu-Ioan Szatmari, *"Personalizing Audiology With User-centered, Private AI"*, Technical University of Denmark, 2025

Thesis Supervision

- PhD, Dario Pisanti, *"Vision-based Geo-Localization of Future Mars Rotocraft in Challenging Illumination Conditions using Deep Learning"*, Scuola Superiore Meridionale / Jet Propulsion Lab, 2025
- MSc, Aditya Singh, *"Instruction-guided Path Generation on Allocentric Maps using Diffusion Models"*, University of Pennsylvania, 2023
- MSc, Bo Wu, *"The Role of Mapping in Modern Robot Navigation Tasks"*, University of Pennsylvania, 2023
- MSc, Shiyani Patel, *"Vector Graph Neural Network: Point Cloud Prediction into the Future"*, University of Pennsylvania, 2021
- MSc, Siddharth Goel, *"Navigation to Multiple Semantic Targets in Novel Environments"*, University of Pennsylvania, 2021

Recent Project Supervision

Isaac Madhavaram (JPL Msc Intern, Summer 2025)
Agata Weglerska (JPL Msc Intern, Summer 2025)
Sofia Talleri (JPL Msc Intern, Summer 2025)
Dimitrios Chatziparaschis (JPL PhD Intern, Fall 2024)
Dario Pisanti (JPL PhD Intern, Spring 2023-Fall 2024)
Jakub Lucki (JPL Msc Intern, Fall 2024)
Haakon Moe (JPL Msc Intern, Fall 2024)
Ramchander Bhaskara (JPL PhD Intern, Summer 2023)

Reviewer

Conferences:	NeurIPS, ICLR, CVPR, CVPRW, ICCV, ECCV, WACV, ACCV, ICRA, IROS
Journals:	TPAMI, RA-L, Autonomous Robots, Transactions on Robotics, Transactions on Image Processing, Pattern Recognition Letters, Signal Processing: Image Communication, IEEE Access
Proposals:	NSTGRO, SBIR