Theodora Kontogianni

PostDoc in Computer Vision · ETH Zürich

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Research Interests

I am currently a postdoctoral fellow at the ETH AI Center with Prof. Dr. Konrad Schindler and Prof. Dr. Siyu Tang. Prior to this I received my PhD at the Computer Vision Group with Prof. Dr. Bastian Leibe at RWTH Aachen University. My research interests lie in the intersection of computer vision and robotics: I develop algorithms that perform 3D scene understanding in real-world environments through interactive and continual learning.

Current Position

ETH Zürich   *Zurich, Switzerland*

Post Doctoral Fellow, ETH Zürich, ETH AI Center   *Jan 2022-Now*

    Mentors: Prof. Dr. Konrad Schindler and Prof. Dr. Siyu Tang

Education

RWTH Aachen University   *Aachen, Germany*

Ph.D. in Computer Vision   *November 2021*

    Thesis Title: *"Object discovery, interactive and 3D segmentation for large-scale computer vision tasks"*
    Thesis Advisor: Prof. Dr. Bastian Leibe

RWTH Aachen University   *Aachen, Germany*

M.Sc. in Media Informatics   *December 2011*

    Thesis Title: *"Semi-Supervised Online Learning for Low-Level Tracking"*
    Thesis Advisor: Prof. Dr. Bastian Leibe

National Technical University of Athens (NTUA)   *Athens, Greece*

Diploma in Electrical and Computer Engineering   *July 2009*

    Thesis Title: *"Model Management System For Graph Databases"*
    Thesis Advisor: Prof. Dr. Timoleon Sellis

Employment

GOOGLE   *Zurich, Switzerland*

Research Intern   *June 2019 - Nov 2019*

- I developed a novel and enhanced method for Interactive Object Segmentation, involving user participation in conjunction with a deep learning model to accurately segment desired objects in images. The key idea of this project is that user feedback can be utilized to dynamically update the model's parameters during testing.
- The project resulted in a paper accepted and presented at ECCV 2020.
- **Mentors:** Dr. Vittorio Ferrari, Dr. Jasper Uijlings, Dr. Michael Gygli

GOOGLE   *Venice CA, USA*

Software Engineer Intern   *May 2018 - Aug 2018*

- Worked on Large-Scale Landmark Recognition. Implemented Iconoid Shift, a more scalable clustering algorithm in C++ and evaluated it against the existing pipeline and other baselines.
- Used Flume for the data preprocessing and the parallel computation of the clustering component.
- **Mentors:** Dr. Tobias Weyand, Dr. Fangting Xia

Zalando AG   *Berlin, Germany*

Data Scientist   *March 2012 - Apr 2014*

- I focused on applying machine learning algorithms to predict sales and perform inventory clustering.
- I defined a new metric to measure the strength of retail brands using web data. This metric was utilized as a feature for inventory replenishment and played a role in negotiations with the brands.

RWTH Aachen University   *Aachen, Germany*

Student Research Assistant   *Jan 2011 - Mar 2011*

- Evaluation and extension of classless object detection algorithms.
- **Mentors:** Prof. Dr. Bastian Leibe

Grants

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<tr><td>2023</td><td>Hasler Stiftung Grant, 50000 CHF, "Open-world segmentation for adaptive autonomous agents", Principal Investigator, 9 months</td><td>ETH Zürich</td></tr>
<tr><td>2021</td><td>ETH AI Center, 180000 CHF, Postdoctoral Fellowship 24 months</td><td>ETH Zürich</td></tr>
<tr><td>2016</td><td>Google Faculty Research Award, 67000 EUR, "Incremental Object Discovery in Time-Varying Image Collections", Joint Principal Investigator with Prof. Bastian Leibe, 12 months</td><td>RWTH Aachen University</td></tr>
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Awards

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<tr><td>2023</td><td>Best Paper Nominee in Human-Robot Interaction, ICRA 2023, London, UK</td></tr>
<tr><td>2023</td><td>GEOSUISSE Award for the master thesis of Yuanwen Yue, "Exploring Interactive Object Segmentation in 3D Point Clouds"</td></tr>
<tr><td>2021-2023</td><td>ETH AI Center Postdoctoral Fellowship, Awarded by the ETH AI Center Zürich, Switzerland (≈180000 CHF)</td></tr>
<tr><td>2023</td><td>ELLIS Member, ELLIS Society</td></tr>
<tr><td>2022</td><td>Winner of the Scan-2-BIM challenge (2nd place), CVPR 2022</td></tr>
<tr><td>2020-2021</td><td>Outstanding Reviewer Award, ECCV 2020, CVPR 2021</td></tr>
<tr><td>2020</td><td>Accepted to Doctoral Consortium, CVPR 2020</td></tr>
<tr><td>2018</td><td>Invited to the Google Computer Vision Summit, Zurich, Switzerland</td></tr>
<tr><td>2016</td><td>Google Faculty Research Award, RWTH Aachen University</td></tr>
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Selected Publications [0.7k+ citations and and h-index of 7]

For a full list of publications please see GoogleScholar

AGILE3D: Attention Guided Interactive Multi-object 3D Segmentation [pdf]
Yuanwen Yue, Sabarinath Mahadevan, Jonas Schult, Francis Engelmann, Bastian Leibe, Konrad Schindler, Theodora Kontogianni
International Conference on Learning Representations (ICLR), 2024

Interactive Object Segmentation in 3D Point Clouds [pdf]
Theodora Kontogianni, Ekin Celikkan, Siyu Tang, Konrad Schindler
IEEE International Conference on Robotics and Automation (ICRA), **Best Paper Nominee in Human-Robot Interaction**, 2023

Connecting the Dots: Floorplan Reconstruction Using Two-Level Queries [pdf]
Yuanwen Yue, Theodora Kontogianni, Konrad Schindler, Francis Engelmann
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023

Dilated Point Convolutions: On the Receptive Field Size of Point Convolutions on 3D Point Clouds [pdf]
Francis Engelmann, Theodora Kontogianni, Bastian Leibe
IEEE International Conference on Robotics and Automation (ICRA), 2020

DualConvMesh-Net: Joint Geodesic and Euclidean Convolutions on 3D Meshes [pdf]
Jonas Schult, Francis Engelmann, Theodora Kontogianni, Bastian Leibe
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), **Oral**, 2020

Continuous Adaptation for Interactive Object Segmentation by Learning from Corrections [pdf]
Theodora Kontogianni, Michael Gygli, Jasper Uijlings, Vittorio Ferrari
European Conference on Computer Vision (ECCV), 2020

3D Bird's -Eye -View Instance Segmentation [pdf]
Cathrin Elich, Francis Engelmann, Theodora Kontogianni, Bastian Leibe
German Conference on Pattern Recognition (GCPR), **YRF DAGM Best Master's Thesis Award**, 2019

Know What Your Neighbors Do: 3D Semantic Segmentation of Point Clouds [pdf]
Francis Engelmann, Theodora Kontogianni, Jonas Schult, Bastian Leibe
European Conference on Computer Vision (ECCV), GMDL Workshop, 2018

Exploring Spatial Context for 3D Semantic Segmentation of Point Clouds [pdf]
Theodora Kontogianni, Francis Engelmann, Alexander Hermans, Bastian Leibe
International Conference on Computer Vision (ICCV), 3DRMS Workshop, **Spotlight**, 2017

Incremental Object Discovery in Time-Varying Image Collections [pdf]
Theodora Kontogianni, Markus Mathias, Bastian Leibe
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), **Google Faculty Research Award**, 2016

Mentoring Students

2023 **Cedric Tschechtelin**, Bachelor Student in Computer Science, ETH Zürich
Topic: "Interactive Object Segmentation of 3D Point Clouds using Active Learning."
Current Status: Master Student, ETH Zürich

2022 **Binbin Xiang**, Ph.D. Student in Photogrammetry and Remote Sensing, ETH Zürich

2022 **Elisabeth Hafner**, Ph.D. Student in WSL-Institut für Schnee- und Lawinenforschung SLF

2022 **Yuanwen Yue**, Master's Student in Computer Science (GEOSUISSE Award for his master thesis), ETH Zürich
Topic: "Exploring Interactive Object Segmentation in 3D Point Clouds."
Current Status: Ph.D. student at Max-Planck-Institut für Informatik, *Saarbrücken, Germany*

2022 **Yunfan Zou**, Master's Student in Computer Science, ETH Zürich
Topic: "Analysis of the Long Tail Problem in Semantic Segmentation of 3D Point Clouds."
Current Status: Quantitative Researcher at J.P.Morgan, *London, UK*

2022 **Aleksandar Jovanov**, Master's Student in Computer Science, RWTH Aachen University
Topic: "Temporal Propagation for Interactive Segmentation in Videos.", *co-supervised with Ali Athar and Sabarinath Mahadevan*

2022 **Frawa Vetterli**, Semester Project, ETH Zürich
Topic: "Tree Instance Segmentation in UAV-LS Point Clouds.", *co-supervised with Binbin Xiang*

2021 **Ekin Celikkan**, Master's Student in Computer Science, RWTH Aachen University
Topic: "Generating Vectorized Floor Plans from 3D Point Clouds."
Current Status: Ph.D. student at HEIBRiDS, *Berlin, Germany*

Teaching

SS23 **Lecturer: Projects in Machine Learning Research**, Dept. of Computer Science, ETH Zürich
SS22 **Lecturer: Projects in Machine Learning Research**, Dept. of Computer Science, ETH Zürich
WS20 **Organizer: Pro-seminar on Image Processing**, RWTH Aachen University
WS18 **Teaching Assistant: Lecture on Computer Vision 2**, RWTH Aachen University
SS18 **Teaching Assistant: Lecture on Computer Vision**, RWTH Aachen University
SS16 **Teaching Assistant: Lecture on Computer Vision**, RWTH Aachen University
WS14 **Teaching Assistant: Lecture on Computer Vision**, RWTH Aachen University
WS16 **Organizer: Seminar on Current Topics in Computer Vision and Machine Learning**, RWTH Aachen University

Academic Duties

CONFERENCE ORGANIZATION

Mar 2024 **International Conference in 3D Vision (3DV)**, Publication and OpenReview Chair, Davos, Switzerland

COMPUTER VISION CONFERENCES REVIEWING

2020-2024 **IEEE Conference on Computer Vision and Pattern Recognition**, (CVPR)
2020-2022 **European Conference on Computer Vision**, (ECCV)
2021 **International Conference on Computer Vision**, (ICCV)

ROBOTICS CONFERENCES REVIEWING

2023 **IEEE International Conference on Robotics and Automation**, (ICRA)
2023,2017 **International Conference on Intelligent Robots and Systems**, (IROS)

MACHINE LEARNING CONFERENCES REVIEWING

2020 **Neural Information Processing Systems**, (NeurIPS)

Talks & Demos

Jun 2023 **Julius Bär**, Demo Presentation
Jun 2023 **Google Austria**, Demo Presentation
Jun 2023 **Heidi Ras Foundation**, Demo Presentation
May 2023 **IEEE International Conference on Robotics and Automation (ICRA)**, Talk
Oct 2022 **European Conference in Computer Vision (ECCV)**, Demo/Tool
Oct 2022 **AI in Hungary**, Talk
May 2021 **ETH AI Center Post-Doc Symposium**, Talk
Jul 2016 **GOOGLE, Venice CA, USA**, Talk