

# Theodora Kontogianni

POSTDOC IN COMPUTER VISION · ETH ZÜRICH

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## Research Interests

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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

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### ETH Zürich

Post Doctoral Fellow, ETH Zürich, ETH AI Center

**Mentors:** [PROF. DR. KONRAD SCHINDLER](#) and [PROF. DR. SIYU TANG](#)

Zurich, Switzerland

Jan 2022-Now

## Education

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### RWTH Aachen University

Ph.D. in Computer Vision

**Thesis Title:** "Object discovery, interactive and 3D segmentation for large-scale computer vision tasks"

**Thesis Advisor:** [PROF. DR. BASTIAN LEIBE](#)

Aachen, Germany

November 2021

### RWTH Aachen University

M.Sc. in Media Informatics

**Thesis Title:** "Semi-Supervised Online Learning for Low-Level Tracking"

**Thesis Advisor:** [PROF. DR. BASTIAN LEIBE](#)

Aachen, Germany

December 2011

### National Technical University of Athens (NTUA)

Diploma in Electrical and Computer Engineering

**Thesis Title:** "Model Management System For Graph Databases"

**Thesis Advisor:** [PROF. DR. TIMOLEON SELLIS](#)

Athens, Greece

July 2009

## Employment

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### GOOGLE

Research Intern

- 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

Zurich, Switzerland

June 2019 - Nov 2019

### GOOGLE

Software Engineer Intern

- 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

Venice CA, USA

May 2018 - Aug 2018

### Zalando AG

Data Scientist

- 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.

Berlin, Germany

March 2012 - Apr 2014

### RWTH Aachen University

Student Research Assistant

- Evaluation and extension of classless object detection algorithms.
- **Mentors:** [PROF. DR. BASTIAN LEIBE](#)

Aachen, Germany

Jan 2011 - Mar 2011

## Grants

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

## Awards

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2023	<b>Best Paper Nominee in Human-Robot Interaction</b> , ICRA 2023, London, UK
2023	<b>GEOSUISSE Award for the master thesis of Yuanwen Yue</b> , “Exploring Interactive Object Segmentation in 3D Point Clouds”
2021-2023	<b>ETH AI Center Postdoctoral Fellowship</b> , Awarded by the ETH AI Center Zürich, Switzerland ( $\approx$ 180000 CHF)
2023	<b>ELLIS Member</b> , ELLIS Society
2022	<b>Winner of the Scan-2-BIM challenge (2<sup>nd</sup> place)</b> , CVPR 2022
2020-2021	<b>Outstanding Reviewer Award</b> , ECCV 2020, CVPR 2021
2020	<b>Accepted to Doctoral Consortium</b> , CVPR 2020
2018	<b>Invited to the Google Computer Vision Summit</b> , Zurich, Switzerland
2016	<b>Google Faculty Research Award</b> , RWTH Aachen University

## Selected Publications [0.7k+ citations and and h-index of 7]

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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

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- 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

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- 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

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### 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

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- 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