MARKUS D. SOLBACH

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CURRICULUM VITAE

EDUCATION

2022	Ph.D. (Computer Science) at York University (Tsotsos Lab for Active and Attentive Vision), Canada
2014	Master of Science (Computer Science) at University of Koblenz, Germany
2013	Bachelor of Science (Computer Science) at University of Koblenz, Germany
	PROFESSIONAL EXPERIENCE
2022 – Present	Postdoctoral Visitor at York University, Canada
2021 - 2022	Research Associate at York University, Canada
2019 – Present	Lab Manager of the Tsotsos Lab for Active and Attentive Vision, Canada • Research Consultation, Software and Hardware Infrastructure, Requisitions
2015 - 2021	Research Assistant at York University, Canada
2015 – Present	 Teaching Assistant at York University, Canada 2021 Winter: 4443 Mobile User Interfaces 2020 Fall: 2030 Advanced OO Programming 2020 Winter: 1520 Computer Use Fundamentals 2019 Fall: 2030 Advanced OO Programming 2019 Winter: 1028 Discrete Math for Engineers 2018 Fall: 3451 Signals and Systems 2018 Winter: 4421 Introduction to Robotics & 4443 Mobile User Interfaces 2017 Fall: 4443 Mobile User Interfaces & 2030 Advanced OO Programming 2017 Winter: 1028 Discrete Math for Engineers & 1022 Mobile Programming 2016 Fall: 1012 Net-centric Introduction to Computing 2016 Winter: 1022 Intro. to Software Dev. & 2021 Computer Organization 2015 Fall: 1012 Introduction to Computer Science & 3451 Signals and Systems
2020	Robotics Consultant at RoboEye, Toronto, Canada • Implemented an approach for vision-based autonomous grasping in an industrial, high-throughput manufacturing setting
2017 - 2018	Part-Time Teacher at St. Clair College, Toronto, Canada
2017	Part-Time Consultant at Altius Analytics Labs Inc., Toronto, Canada • Precise 3D Human Pose Tracking for rehabilitation purposes. • Implemented approaches using classic computer vision & deep learning
2014 - 2017	Consultant & Developer at DSA GmbH/SKYLYZE, Germany • Developed Build Server implementation for large-scale Java projects (Big Data) • Created Pentaho plugin for live master data editing • Designed and implemented a virtual-machine environment
2014	Exchange Semester at the University of the Balearic Islands, Spain Designed and implemented a vision-based 6D SLAM approach for underwater autonomous vehicles using extended Kalman Filtering (Master of Science thesis)

2013 - 2014	 Research Assistant at Active Vision Group of the University of Koblenz, Germany Developed autonomous Mars exploration robot for DLR (German Aerospace Center) Implemented vision-based system for rehabilitation support
2012-2013	Exchange Semester at Fraunhofer IDM at Nanyang Technological University,
	 Designed and implemented automatic initialization of model-based 3D tracking (Bachelor of Science thesis)
2012 - 2013	Research Assistant at Fraunhofer IDM, Nanyang Technological University, Singapore
	• Designed and implemented automatic initialization of model-based 3D tracking (Bachelor of Science thesis)
2012	Research Assistant at the Institute of Software Engineering of the University of Koblenz, Germany
	• Implemented a system to model and monitor real-time software congruencies
	PUBLICATIONS
2023	Solbach, Markus D., Tsotsos, K. "The psychophysics of human three-dimensional active visuospatial problem-solving" Scientific Report 13, 19967, 2023.
2022	Solbach, Markus D. "Active Observers in a 3D World: Human Visual Behaviours for Active Vision" Ph.D. Thesis, York University, 2022.
2021	Solbach, Markus D., Tsotsos, John K. "Blocks World Revisited: The Effect of Self-Occlusion on Classification by Convolutional Neural Networks" In Proceedings of the IEEE/CVF International Conference on Computer Vision 2021 (Workshop: Real-World Computer Vision from Inputs with Limited Quality (RLQ)) (pp. 3505-3514), 2021.
	Korbach, Christian, Solbach, Markus D., Memmesheimer, Raphael, Paulus, Dietrich, Tsotsos, John K. "Next-Best-View Estimation based on Deep Reinforcement Learning for Active Object Classification" arXiv preprint arXiv:2110.06766, 2021.
	Solbach, Markus D., Tsotsos, John K. "Active Observer Visual Problem-Solving Methods are Dynamically Hypothesized, Deployed and Tested" Ninth Advances in Cognitive Systems (ACS) Conference 2021 (arXiv:2201.06134), 2021.
	Solbach, Markus D., Tsotsos, John K. "Tracking Active Observers in 3D Visuo-Cognitive Tasks" Symposium on Eye Tracking Research and Applications (ETRA '21 Adjunct), 2021.
	Tsotsos, John K., Abid, Omar, Kotseruba, Iuliia, Solbach, Markus D. "On the Control

2020 Solbach, Markus D., Tsotsos, John K. "PESAO: Psychophysical Experimental Setup for Active Observers" arXiv preprint arXiv:2009.09933, 2020.

Solbach, Markus D. and Tsotsos, John K. "Active Observers in a 3D World: The 3D Same-Different Task" Journal of Vision. The Association for Research in Vision and Ophthalmology, 2020.

2018 Rosenfeld, Amir, Solbach, Markus D. and Tsotsos, John K. "Totally Looks Like-How Humans Compare, Compared to Machines" Asian Conference on Computer Vision. Springer, Cham, 2018.

Tsotsos, John K., Kotseruba, Iuliia, Rasouli, Amir and Solbach, Markus D. "Visual attention and its intimate links to spatial cognition" Cognitive processing 19.1 (2018): 121-130.

Rosenfeld, Amir, Solbach, Markus D. and Tsotsos, John K. "Totally Looks Like-How

Humans Compare, Compared to Machines" Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops. 2018.

Solbach, Markus D., Voland, Stephen, Edmonds, Jeff and Tsotsos, John K. "Random Polyhedral Scenes: An Image Generator for Active Vision System Experiments" arXiv preprint arXiv:1803.10100, 2018.

Rosenfeld, Amir, Solbach, Markus D. and Tsotsos, John K. "Totally-Looks-Like: A Dataset and Benchmark of Semantic Image Similarity" Journal of Vision 18.10 (2018): 136-136.

- 2017 Solbach, Markus D., Tsotsos, John K. "Vision-Based Fallen Person Detection for the Elderly" Computer Vision Workshop (ICCV-W), 2017 IEEE International Conference on. IEEE, 2017.
- 2016 Solbach, M., et al. "Robust world-centric stereo EKF localization with active loop closing for AUVs" Pattern Recognition and Image Analysis 26.1 (2016): 205-215.
- 2015 Bonin-Font, F., Pep Lluis Negre Carrasco, A., Solbach, M., Oliver, G. "Stereo SLAM for Robust Dense 3D Reconstruction of Underwater Environments" In MTS/IEEE Oceans, 2015.

EDITORIAL DUTIES

Review International Conference on Computer Vision (ICCV), Conference on Computer Vision and Pattern Recognition (CVPR), International Conference on Computer Vision Systems (ICVS), IET Computer Vision Journal, Signal, Image and Video Processing Journal, Computer Vision and Image Understanding Journal

PROFESSIONAL AFFILIATIONS

- 2023 Present Review Editor, Frontiers in Science
 - 2016 2018 President of computer science and engineering graduate student's association, York University
 - 2016 2017 Students' rep. on the Tenure & Promotion Committee, York University
 - 2015 2016 Vize-president of computer science and engineering graduate student's association, York University

SKILLS

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Programming Languages Libraries	C/C++, Python, Java, Bash, JavaScript, C#, MATLAB, Octave, Go,
	OpenCV, ROS, Gazebo, Lab Streaming Layer, PCL, OpenGL, OpenCL, CUDA, TensorFlow, PyTorch, Three.js, Pandas, NumPy, SciPy,
Software	Docker, Git, Unity, Asana, JetBrains, Adobe Creative Cloud, Pentaho,
Database	PostgreSQL, MySQL, MongoDB, SQLite
Robotic Systems	PAL Robotics, Kinova, Clearpath, Universal Robots, Adept, Custom Builds,
Product Prototyping	Fusion360 (Design & Simulation), Electronic circuit design, 3D Printer (Bambulab, Ultimaker, Ender, MakerBot), Slicer software,
Languages	German (Mother tongue) \cdot English (Fluent) \cdot Spanish (Beginner) \cdot Latin