Selim Engin

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Education

University of Minnesota — Minneapolis, MN
Ph.D. in Computer Science and Engineering — *Sept 2016 - Oct 2022*
Advisor: Prof. Volkan Isler

Sabancı University — Istanbul, Turkey
B.Sc. in Mechatronics Engineering, with high honors — *Sept 2012 - June 2016*

Experience

Sony R&D US Laboratory — San Jose, CA
Senior Research Scientist — *Feb 2024 - present*

Samsung Research Artificial Intelligence Center — New York City, NY
Senior Research Scientist — *Oct 2022 - Feb 2024*

- Registering user-captured smartphone videos to LiDAR maps obtained by mobile robots
- Leveraging pre-trained vision-language models for generalizable 3D scene reconstruction from a single view
- Fine-level text and pose control for diffusion-based neural image generation
- Physics-aware object pose refinement at the scene level for creating physically plausible digital twins

Sony R&D US Laboratory — San Mateo, CA (online)
Research Intern — *Jun 2021 - Aug 2021*

- Generative models for motion prediction and in-betweening to animate human characters

Samsung Research Artificial Intelligence Center — New York City, NY
Research Intern — *Jan 2019 - Aug 2019*

- Single-view and multi-view 3D object reconstruction, and object part decomposition from images
- Built a multi-camera rig and a turntable setup for scanning objects

Robotic Sensor Networks Lab — Minneapolis, MN
Graduate Student — *Sept 2016 - Oct 2022*

- Developed methods for playing zero-sum multi-agent games using compressed state representations
- Field experiments and algorithm design for localization of targets using bearing-only sensors
- Worked on (self-)supervised learning methods for novel view synthesis and 3D reconstruction

Publications

* inditactes equal contribution.

1. J-J. Chao*, **S. Engin***, N. Chavan-Dafle, B. Lee, V. Isler, VioLA: Aligning Videos to 2D LiDAR Scans, *International Conference on Robotics and Automation*, **ICRA 2024**.
2. I. Kasahara, S. Agrawal, **S. Engin**, N. Chavan-Dafle, S. Song, V. Isler, RIC: Rotate-Inpaint-Complete for Generalizable Scene Reconstruction, *International Conference on Robotics and Automation*, **ICRA 2024**.
3. S. Agrawal, N. Chavan-Dafle, I. Kasahara, **S. Engin**, J. Huh, V. Isler, Real-time Simultaneous Multi-Object 3D Shape Reconstruction, 6DoF Pose Estimation and Dense Grasp Prediction, *IEEE/RSJ International Conference on Intelligent Robots and Systems*, **IROS 2023**.
4. **S. Engin**, V. Isler, Neural Optimal Control using Learned System Dynamics, *International Conference on Robotics and Automation*, **ICRA 2023**.

5. J-J. Chao, **S. Engin**, N. Hani, V. Isler, Category-Level Global Camera Pose Estimation with Multi-Hypothesis Point Cloud Correspondences, *International Conference on Robotics and Automation*, **ICRA 2023**.
6. **S. Engin**, Q. Jiang, V. Isler, Learning to Play Pursuit-Evasion with Visibility Constraints, *IEEE/RSJ International Conference on Intelligent Robots and Systems*, **IROS 2021**.
7. **S. Engin**, V. Isler, Establishing Fault-Tolerant Connectivity of Mobile Robot Networks, *IEEE Transactions on Control of Network Systems*, **TCNS 2021**.
8. N. Häni, **S. Engin**, J-J. Chao, V. Isler, Continuous Object Representation Networks: Novel View Synthesis without Target View Supervision, *Conference on Neural Information Processing Systems*, **NeurIPS 2020**.
9. **S. Engin**, V. Isler, Active Localization of Multiple Targets Using Noisy Relative Measurements, *Workshop on the Algorithmic Foundations of Robotics*, **WAFR 2020** (invited to IJRR special issue).
10. **S. Engin**, E. Mitchell, D. Lee, V. Isler, D. D. Lee, Higher Order Function Networks for View Planning and Multi-View Reconstruction, *International Conference on Robotics and Automation*, **ICRA 2020**.
11. E. Mitchell, **S. Engin**, V. Isler, D. D. Lee, Higher Order Function Networks for Learning Composable 3D Object Representations, *International Conference on Learning Representations*, **ICLR 2020**.
12. **S. Engin**, V. Isler, Asynchronous Network Formation in Unknown and Unbounded Environments, *International Conference on Robotics and Automation*, **ICRA 2019**.
13. **S. Engin**, V. Isler, Minimizing Movement to Establish the Connectivity of Randomly Deployed Robots, *International Conference on Automated Planning and Scheduling*, **ICAPS 2018**.
14. H. Bayram, N. Stefas, **S. Engin**, V. Isler, Tracking Wildlife with Multiple UAVs: System Design, Safety and Field Experiments, *IEEE International Symposium on Multi-Robot and Multi-Agent Systems*, **MRS 2017**.

Patents

- Higher-order function networks for learning composable three-dimensional (3d) object and operating method thereof (Patent No.: US 10,922,877)

Honors

- Highlighted Reviewer at ICLR (2022)
- Cedar Creek Ecosystem Science Reserve Fellowship (2018)
- University of Minnesota CSE Fellowship (2017)
- Sabancı University Scholarship (2012-16)

Teaching Experience

- CSCI 1133 - Introduction to Computing and Programming Concepts (Spring 2017, Fall 2017):
  GitHub organization setup for the class, assignment preparation, grading and auto-grading
- CSCI 5561 - Computer Vision:
  Grading and giving feedback for term projects

Professional Services

Reviewer for ICRA, IROS, NeurIPS, ICLR, WACV, ISER, WAFR
Journals: Transactions on Robotics, Robotics and Automation Letters, Artificial Intelligence (AIJ)
Session chair at: IROS 2021 (Machine Learning for Robot Control)

Technical Skills

Languages: Python, C, C++, Matlab/Simulink
Libraries and Frameworks: PyTorch, Tensorflow, CUDA, Android Studio, ARCore, ROS, OpenCV, Open3D
Simulation and Graphics: V-REP, Gazebo, PyBullet, MuJoCo, Nimble, Habitat, Blender, SolidWorks, Unreal Engine