

Maksim SOROKIN

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🌐 <https://initmaks.com/>

My research develops learning-based systems for autonomous robotics, with expertise spanning vision-based navigation, computational robot design, and whole-body manipulation. I focus on robot learning systems that learn efficiently and generalize in the real world.

Competences : Python IsaacLab MuJoCo Pytorch Numpy OpenCV C/C++ Tensorflow Docker

🎓 EDUCATION

2020 - Now	Georgia Institute of Technology Ph.D. in Robotics with the focus on vision-based robot learning. Advised by Dr. Sehoon Ha	(Atlanta, GA)
2017 - 2020	Georgia Institute of Technology M.S. in Computer Science, Specialization in Computational Perception and Robotics Advised by Dr. C. Karen Liu	(Atlanta, GA)
2013 - 2017	Izmir University of Economics B.S. in Computer Engineering	(Izmir, Turkey)

💼 EXPERIENCE

Present	Applied Scientist Working on contact-rich whole-body manipulation learning. Whole-body Manipulation Reinforcement Learning Privileged Learning	RAI INSTITUTE (PREV. BOSTON DYNAMICS AI INSTITUTE)
Jan 2024	AI Resident @ Everyday Robots ➤ worked on a learning-oriented robot hardware optimization framework ➤ achieved robot learning sample efficiency improvement of 25-fold ➤ as well as performance improvement of 15-20% on various manipulation tasks Privileged Learning Behavioral Cloning Manipulation Hardware Optimization	GOOGLE X
May 2020 Sep 2018	Head Teaching Assistant Artificial Intelligence class under Dr. Thomas Ploetz & Dr. Thad Starner ➤ Helped organize and lecture the class of 800+ students ➤ Led the team of 16 Teaching Assistants ➤ Responsible for assignments, exams, and course coordination Machine Learning Python Numpy Jupyter Docker	GEORGIA TECH

📄 PUBLICATIONS

🌐 IEEE ROBOTICS AND AUTOMATION LETTERS (RA-L) [2024]

JACTA : A VERSATILE PLANNER FOR LEARNING DEXTEROUS AND WHOLE-BODY MANIPULATION

Jan Brüdigam, Ali Adeeb Abbas, **Maks Sorokin**, Kuan Fang, Brandon Hung, Maya Guru, Stefan Sosnowski, Jiuguang Wang, Sandra Hirche, Simon Le Cleac'h

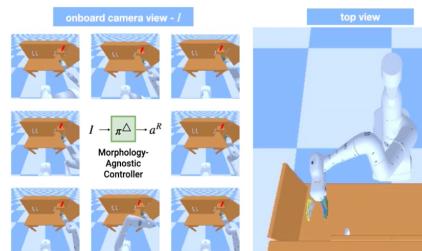
We combine reinforcement learning with sampling-based planning to solve contact-rich manipulation tasks. By distilling planner demonstrations into a robust RL policy, we achieve the best of both worlds : the exploration efficiency of sampling-based methods and the robustness of learned policies to real-world variations and uncertainties.



 INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS (IROS) [2023]
ON DESIGNING A LEARNING ROBOT: IMPROVING ROBOT FOR ENHANCED LEARNING

Maks Sorokin, Chuyuan Fu, Jie Tan, C. Karen Liu, Yunfei Bai, Wenlong Lu, Sehoon Ha, Mohi Khansari

We present a learning-oriented robot design optimization framework that accounts for the interplay between the robot's morphology, onboard perception abilities, and their interaction in different tasks. We find that designs optimized holistically improve performance by 15 – 20% on manipulation tasks, and require 25x less data to match human-expert made robot performance.

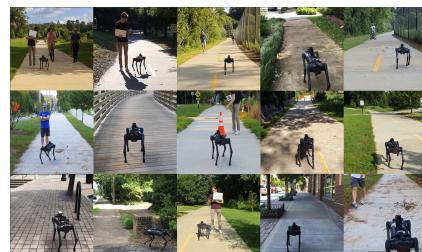


 IEEE ROBOTICS AND AUTOMATION LETTERS (RA-L) [2022]

LEARNING TO NAVIGATE SIDEWALKS IN OUTDOOR ENVIRONMENTS

Maks Sorokin, Jie Tan, C. Karen Liu, Sehoon Ha

We design a system which enables zero-shot policy transfer to the real-world outdoor environments for sidewalk navigation task. Our approach is evaluated on a quadrupedal robot navigating sidewalks in the real world walking 3.2 kilometers with a limited number of human interventions.



 ROBOTICS : SCIENCE AND SYSTEMS [2022]

HUMAN MOTION CONTROL OF QUADRUPEDAL ROBOTS USING DEEP RL

Sunwoo Kim, Maks Sorokin, Jehee Lee, Sehoon Ha

We propose a novel motion control system that allows a human user to operate various motor tasks seamlessly on a quadrupedal robot. Using our system a user can execute a variety of motor tasks, including standing, sitting, tilting, manipulating, walking, and turning, on simulated and real quadrupeds.



 EUROGRAPHICS [2021]

LEARNING HUMAN SEARCH BEHAVIOR FROM EGOCENTRIC VIEW

Maks Sorokin, Wenhao Yu, Sehoon Ha, C. Karen Liu

We train vision-based agent to perform object searching in photorealistic 3D scene. And propose a motion synthesis mechanism for head motion re-targeting. Using which we enable object searching behaviour with animated human character (PFNN/NSM).

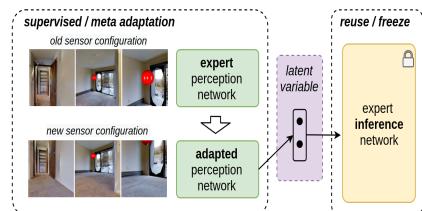


 ICRA [2021]

A FEW SHOT ADAPTATION OF VISUAL NAVIGATION SKILLS TO NEW OBSERVATIONS USING META-LEARNING

Qian Luo, Maks Sorokin, Sehoon Ha

We show how vision-based navigation agents can be trained to adapt to new sensor configurations with only three shots of experience. Rapid adaptation is achieved by introducing a bottleneck between perception and control networks, and through the perception component's meta-adaptation.



 AWARDS

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| 2022 | Deep Learning Course by Danfei Xu |
| | Best Project Award (Honorable Mention) - based on the overall project quality : effort, novelty, and creativity |
| 2021 | ML@GT fellowship |
| | Awarded the fellowship by the Machine Learning Center at Georgia Tech |
| 2020 | “Thank a Teacher” @ Georgia Tech |
| | Recognition for excellence in teaching Artificial Intelligence class |
| 2017 | Scientific and Technological Research Council of Turkey |
| | Finalist of Country-wide Software Development University Competition |
| 2017 | Informatics Association of Turkey |
| | Best University Graduation Project - University Exhibition Visitors Choice |
| 2017 | Udacity DIDI - Self-driving Car challenge |
| | 7th in round 1, and 12th in round 2 out of 2000 teams competition |