BERNARD LANGE

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SKILLS

Programming	Python, PyTorch, Langchain, ROS, RLlib
Languages	English, Polish

SELECTED PROJECTS

Sensor Configuration Agnostic World Model and Novel View Synthesis for Autonomous Driving – current research

- Working on an open-source foundational model for autonomous driving that enables environment prediction and novel view synthesis.
- Designed to be sensor-agnostic, supporting a wide range of configurations—from a single dashcam to a full 360° platform with 8 cameras and 4 LiDARs.
- Trained on *4000+* hours of camera footage and *600+* hours of LiDAR data.

Unified Perception, Reasoning, and Acting in General-Purpose Navigation Tasks via Language Vision Models – under review

- A general-purpose embodied navigation agent that integrates LVLMs with scene graphs and sensor measurements, enabling autonomous navigation and problem-solving in unknown environments.
- Agentic principles are used to generate and execute any navigational and logical plan, access any collected information via tool use, and carry over findings as part of our spatial belief.

Self-supervised Multi-future Occupancy Forecasting for Autonomous Driving – under review

- A prediction framework that generates multi-future occupancy predictions conditioned on maps, camera observations, and planned trajectory.
- Offers two decoding approaches: 1) A single-step decoder for high-quality, real-time predictions. 2) A diffusion-based batch decoder for refined predictions.

ASTPrompter: Weakly Supervised Automated Language Model Red-Teaming to Identify Low-Perplexity Toxic Prompts – under review

- A reinforcement learning formulation of LLM red-teaming designed to discover prompts that elicit toxic outputs from a defender and have low perplexity as scored by that defender.

Scene Informer: Anchor-based Occlusion Inference and Trajectory Prediction in Partially Observable Environments – ICRA 2024

- A transformer-based framework for occlusion inference and trajectory prediction in partially observable setting.

EDUCATION

Stanford University – Aeronautics & Astronautics, PhD Candidate, advised by Prof. Mykel Kochenderfer	**May 2020 - Jun. 2025**
Stanford University – Computer Science, PhD Minor Candidate, advised by Prof. Mykel Kochenderfer	**May 2020 - Jun. 2025**
Stanford University – Aeronautics & Astronautics, Master's Degree	**Oct. 2018 - May 2020**
University of Bristol – Mechanical Engineering, Beng, First-Class Honours Degree	**Sep. 2015 - Jun. 2018**
Wroclaw University of Science Technology – Courses in Mathematics and Physics	**Sep. 2013 - Apr. 2015**

WORK EXPERIENCE

Stanford Intelligent Systems Lab, Graduate Research Assistant	**Jan. 2020 - current**
Cruise, AI Research Intern	**Jun. 2022 - Mar. 2023**
Alliance Innovation Lab Silicon Valley (Nissan), Decision-Making Research Intern	**Jun. 2019 - Jan. 2020**
Stanford University, Teaching Assistant	**Mar. 2019 - Jun. 2019**

PUBLICATIONS

Lange, B., Yildiz, A., Arief, M., Khattak, S., Kochenderfer, M. J., & Georgakis, G. (2024, November). Unified Perception, Reasoning, and Acting in General-Purpose Navigation Tasks via Language Vision Models. *Under review.*

Lange, B., Itkina, M., Li, J., & Kochenderfer, M. J. (2024, July). Self-supervised Multi-future Occupancy Forecasting for Autonomous Driving. *Under review.*

Hardy, A., Houjun, L., **Lange, B.**, & Kochenderfer, M. J. (2024, June). ASTPrompter: Weakly Supervised Automated Language Model Red-Teaming to Identify Likely Toxic Prompts. *Under review.*

Lange, B., Li, J., & Kochenderfer, M. J. (2024, May). Scene Informer: Anchor-based Occlusion Inference and Trajectory Prediction in Partially Observable Environments. In *2024 IEEE International Conference on Robotics and Automation (ICRA).*

Lange, B., Itkina, M., & Kochenderfer, M. J. (2022). LOPR: Latent Occupancy PRediction using Generative Models. *arXiv preprint*.

Delecki, H., Itkina, M., **Lange, B.,** Senanayake, R., & Kochenderfer, M. J. (2022, September). How Do We Fail? Stress Testing Perception in Autonomous Vehicles. In *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).*

Lange, B., Itkina, M., & Kochenderfer, M. J. (2021, September). Attention Augmented ConvLSTM for Environment Prediction. In *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).*

Wray, K. H., **Lange, B.**, Jamgochian, A., Witwicki, S. J., Kobashi, A., Hagaribommanahalli, S., & Ilstrup, D. (2021, March). POMDPs for Safe Visibility Reasoning in Autonomous Vehicles. In *2021 IEEE International Conference on Intelligence and Safety for Robotics (ISR)* (pp. 191-195).

Wray, K. H., **Lange, B.**, Jamgochian, A., Witwicki, S. J., Kobashi, A., Hagaribommanahalli, S., & Ilstrup, D. (2020, July). POMDP Autonomous Vehicle Visibility Reasoning. In *2020 RSS Workshop on Interaction and Decision-Making in Autonomous Driving.*

TALKS

"CARS Annual Meeting & Poster Session". Research Presenter. Center for Automotive Research at Stanford (Virtual), November 2020

"Bay Area Robotics Symposium". Research Presenter. Stanford University (Virtual), November 2020

TEACHING

EE104: Intro to Machine Learning, Teaching Assistant **Spring 2019**

AA228/CS 238: Decision Making under Uncertainty, Teaching Assistant **Fall 2023**

REVIEWING

Conference on Neural Information Processing Systems 5th Robot Learning Workshop: Trustworthy Robotics

IEEE Robotics and Automation Letters

IEEE International Conference on Robotics and Automation

IEEE/RSJ International Conference on Intelligent Robots and Systems

Conference on Neural Information Processing Systems 4th Robot Learning Workshop: Self-Supervised and Lifelong Learning

Journal of Artificial Intelligence Research

Journal of Aerospace Information Systems

VOLUNTEERING

2021 Conference on Neural Information Processing Systems 4th Robot Learning Workshop: Self-Supervised and Lifelong Learning

COURSES

Stanford:
AA 203: Optimal and Learning-based Control
AA 222: Engineering Design Optimization (CS 361)
AA 228: Decision Making under Uncertainty (CS 238)
AA 229: Advanced Topics in Sequential Decision Making (CS 239)
AA 273: State Estimation and Filtering for Robotic Perception
AA 274: Principles of Robot Autonomy (CS 237, EE 260)
AA 289: Robotics and Autonomous Systems Seminar (CS 529)
CS 106L: Standard C++ Programming Laboratory
CS 107: Computer Organization and Systems
CS 161: Design and Analysis of Algorithms
CS 221: Artificial Intelligence: Principles and Techniques
CS 224R: Deep Reinforcement Learning
CS 229: Machine Learning (STATS 229)
CS 231A: Computer Vision
CS 231N: Deep Learning for Computer Vision
CS 234: Reinforcement Learning
CS 236: Deep Generative Models
CS 330: Deep Multi-task and Meta Learning
CS 332: Advanced Survey of Reinforcement Learning
CS 348N: Neural Models for 3D Geometry
CS 472: Data science and AI for COVID-19 (BIODS 472, BIOMEDIN 472)
CS 520: Knowledge Graphs
EE 263: Introduction to Linear Dynamical Systems (CME 263)
EE 364A: Convex Optimization I (CME 364A)
EE 364B: Convex Optimization II (CME 364B)
STATS 315A: Modern Applied Statistics: Learning
ENGR 205: Introduction to Control Design Techniques
CME 250: Introduction to Machine Learning
ME 302B: The Future of the Automobile- Driver Assistance
ME 302C: The Future of the Automobile- Mobility Entrepreneurship
MS&E 472: Entrepreneurial Thought Leaders' Seminar
Udacity: Self-Driving Car Engineer Term 1
edX: Autonomous Mobile Robots (ETH Zurich) – Locomotion, Perception, and Intelligent Navigation

OTHER EXPERIENCE

Stanford University Ski and Snowboard Team, Social Coordinator **Sep. 2021 - Apr. 2022**
Stanford University Ski and Snowboard Team, SL Racer **Sep. 2019 - Apr. 2021**
Amnesty International Stanford University, Financial Officer **Sep. 2019 - May 2020**
University of Bristol Polish Society, Treasurer **Jun. 2016 - May 2018**
University of Bristol Snowsports Club, SL Racer (BUCS) **Sep. 2016 - May 2018**