Reinis **Cimurs**

✉ ireinisi@gmail.com | 📱 +491623512403 | 📍 Stuttgart, Germany | 🔗 https://github.com/reiniscimurs

Summary

Ph.D. graduate in Intelligent Robot Engineering with extensive experience applying Artificial Intelligence to real-world problems. Strong hands-on background in machine learning for object classification, policy generation, and decision-making using imitation and reinforcement learning. Proficient in Python, C, and MATLAB, with demonstrated expertise in deep learning frameworks such as TensorFlow and PyTorch. Adaptable to diverse work environments with a proven effective cross-cultural collaboration track record.

Experience

Robert Bosch GmbH *Stuttgart, Germany*
MACHINE LEARNING RESEARCH ENGINEER *Dec 2021 – Present*
- Developed graph neural networks for simulating realistic driver behavior in simulation
- Designed neural networks for learning motion policies through closed-loop differentiable simulation
- Implemented vectorized map topology representation with cross-attention
- Implemented node information exchange with transformer-based modules in graph neural networks
- Applied and tested large language model embedding guidance for scene understanding in autonomous driving
- Introduced and maintained MLflow experiment tracking service and programmed logging methods for it
- Maintained machine learning infrastructure and development pipelines with focus of hyperparemeter optimization and configuration management

Hanyang University *Seoul, Korea*
POST-DOCTORAL RESEARCHER *Sep 2020 – Nov 2021*
- Lead of a fully autonomous goal-driven SLAM system development project
- Developed a Deep Reinforcement Learning-based mobile robot navigation models from lidar sensor inputs
- Deployed neural network policies to a fully autonomous goal-driven robot exploration system
- Integrated building evacuation plan information into ROS navigation stack through OpenCV
- Developed heuristics methods for AI-based navigation

Intelligence and Control for Robots Laboratory *Seoul, Korea*
RESEARCHER *Sep 2015 – Aug 2020*
- Developed non-holonomic trajectory generation method with kinematic constraints in two and three dimensions
- Created end-to-end deep learning networks for robot navigation in dynamic environments
- Designed reward structures for machine learning considering human-based proxemics
- Deployed laser, camera, RGB-D sensor-based planning, and SLAM systems through ROS framework

AGV Serviss *Riga, Latvia*
AUTOMATION ENGINEER *Aug 2012 – Jul 2014*
- Serviced automation systems for food manufacturing plants and logistics centers
- Programmed PLC and SCADA devices for large scale refrigeration systems

Education

Hanyang University *Seoul, Korea*
PH.D. IN INTELLIGENT ROBOT ENGINEERING *Sep 2015 – Aug 2020*
- Received the Korean Government Scholarship to pursue the Ph.D. program
- Performed research in artificial intelligence for robotic sensors, platforms, optimization, and decision making
- Ph.D. thesis - Adaptive Motion for Planned and Reactive Robot Navigation

Riga Technical University *Riga, Latvia*
M.SC. IN AUTOMATION AND COMPUTER CONTROL *Sep 2011 – Feb 2014*
- A professional M.Sc. degree program including a year-long internship in a related industry
- Covered theory of machine learning with computer vision applications
- M.Sc. thesis - Development of a Virtual Line Following Robot

Riga Technical University *Riga, Latvia*
B.SC. IN AUTOMATION AND COMPUTER CONTROL *Sep 2008 – Jun 2011*
- Studied computer science, Pascal, C/C++, microprocessor programming with an emphasis on control theory
- B.Sc. thesis - Development and Control of Building Heating Systems

Skills

Programming & Tools: Python, C, Matlab, Bash, ROS, OpenCV, MLFlow, Git, Gazebo, Stable-Baselines
Frameworks: Tensorflow, Pytorch, PyG, HuggingFace Transformers, OpenAI APIs
AI/ML: DNN, CNN, RNN, Transformers, GNN, Deep RL, Imitation Learning, LLM Embedding Guidance
Robotics & Simulation: RRT, RRT*, A*, Trajectory Optimization, Non-holonomic Constraints, Closed-loop and Differentiable Simulation
DevOps & MLOps: MLFlow, Tensorboard, Hyperparameter Optimization, Configuration Management (Hydra)
Languages: Latvian - Native, English - Fluent, Russian - Upper Intermediate, Korean - Intermediate, German - Beginner

Publications

Goal-driven autonomous exploration through deep reinforcement learning
INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION   *May 2022*
> A framework that combines deep reinforcement learning with goal-driven exploration to enable robot navigation in unfamiliar environments.

Information-Based Heuristics for Learned Goal-Driven Exploration and Mapping
INTERNATIONAL CONFERENCE ON UBIQUITOUS ROBOTS   *Jul 2021*
> Heuristics method for goal selection in an environment exploration algorithm, where navigation is performed by a neural network.

Goal-oriented obstacle avoidance with deep reinforcement learning in continuous action space
JOURNAL ELECTRONICS   *Mar 2020*
> Using deep reinforcement learning, a robot learns to arrive at a goal while avoiding obstacles from depth camera inputs.

Proxemics-based Deep Reinforcement Learning for Robot Navigation in Continuous Action Space
JOURNAL OF INSTITUTE OF CONTROL, ROBOTICS AND SYSTEMS   *Mar 2020*
> Teaching motion behavior with a proxemics-based cost function

Time-optimized 3D path smoothing with kinematic constraints
INTERNATIONAL JOURNAL OF CONTROL, AUTOMATION AND SYSTEMS   *Jan 2020*
> Generation of a kinematically constrained trajectory from a path planner in three dimensions

Bezier curve-based smoothing for path planner with curvature constraint
INTERNATIONAL CONFERENCE ON ROBOTIC COMPUTING   *Apr 2017*
> A path smoothing method for two-dimensional path planners with curvature constraints

Honors & Awards

Dec 2016	**Excellent Academic Achievement Award**, National Institute for International Education, Republic of Korea	*Seoul, Korea*
Nov 2016	**Certificate of Recognition**, Embassy of Republic of Latvia in Republic of Korea	*Seoul, Korea*
Jun 2014	**Korean Government Scholarship Program Scholar**, National Institute for International Education, Republic of Korea	*Seoul, Korea*

Interests

Deep learning, Robot navigation, Large Language Models, Reading, Trail running, American Football

Extracurricular Activity

Stuttgart Silver Arrows American Football Team   *Stuttgart, Germany*
BADEN-WURTTENBERG REGIONAL LEAGUE   *Jan 2022 - Present*
> Player for Baden-Wurttenberg Regional League team Stuttgart Silver Arrows

Seoul Golden Eagles American Football Team   *Seoul, Korea*
KOREAN NATIONAL FOOTBALL LEAGUE   *Jun 2018 - Nov 2021*
> Player for Korean National Football League team Seoul Golden Eagles. Defense captain 2019 to 2021 seasons.