Seokha Moon

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About Me

I am a Ph.D Student at Korea University, Vision & AI lab (Advisor: Prof. Jinkyu Kim). Before joining the Vision & AI Lab, I earned a Bachelor's degree in Computer Science from Yonsei University. My research interests lie in the field of Computer Vision, particularly **autonomous robots and autonomous driving**. Recently, I have been focusing on camera-based perception tasks in autonomous driving, including 3D detection and occupancy prediction. I also explored trajectory prediction with an emphasis on modeling interactions between agents, using vision-driven text guidance as supervision to inform the model of relevant contextual cues needed to understand each agent's situation. Currently, I am particularly interested in Vision-Language Navigation for autonomous robots and End-to-End frameworks for autonomous driving.

Education

MS/Ph.D **Korea University**, Computer Science and Engineering — Sep. 2022 to Present

- GPA: 4.37/4.5
- Advisor: Prof. Jinkyu Kim

BS **Yonsei University**, Computer Science — Mar. 2016 to Aug. 2022

- GPA: Overall 3.67/4.3 Major **3.97/4.5**
- **Coursework:** Operating System, Computer Architecture, Algorithms, Data Structures, Computer Graphics, Object-Oriented Programming, Artificial Intelligence, Computational Theory.

Experience

NAVER LABS, Robot & AD Localization, Research Intern — Gyeonggi-do, South Korea, Sep. 2024 to Mar. 2025, 6 months

- Developed a efficient yet effective 3D occupancy prediction model (StreamOcc).
- Achieved SOTA performance while maintaining real-time inference speed and reducing memory usage by more than half compared to previous multi-frame fusion approaches.

42dot., Motion prediction engineer, Intern — Seoul, South Korea, Aug. 2022 to Dec. 2022, 4 months

- Developed algorithms to infer correlations between agents moving at intersections.
- Researched a teacher-student model incorporating a student model that efficiently considers interactions between agents by mimicking teacher networks and teacher models that jointly consider the future movements of other agents.

Korea Univ. Vision & AI Lab Internship, Intern — Seoul, South Korea, Jan. 2022 to Aug. 2022, 9 months

- Implemented state of the art Multi-view 3D Object Detection model (ORA3D)
- Developed algorithms for the occupancy prediction challenge using the Waymo Open Dataset.

Samsung Electronics, Face Detection Project, Intern — Gyeonggi-do, South Korea, Mar. 2021 to June 2021, 4 months

- Implemented few shot face detection algorithm using attention mechanism.
- Created face dataset and designed a pipeline to augment dataset.

Publications

Mitigating Trade-off: Stream and Query-guided Aggregation for Efficient and Effective 3D Occupancy Prediction 2025

Seokha Moon, Janghyun Baek, Giseop Kim, Jinkyu Kim, Sunwook Choi

We propose a novel, efficient, yet effective 3D occupancy prediction model termed StreamOcc, which mitigates the accuracy-efficiency trade-off by applying a stream-based spatiotemporal voxel aggregation method.

Work done during an internship at NAVER LABS.

arXiv

Who Should Have Been Focused: Transferring Attention-based Knowledge from Future Observations for Trajectory Prediction 2024

Seokha Moon, Kyuhwan Yeon, Hayoung Kim, Seong-Gyun Jeong, and Jinkyu Kim

International Conference on Pattern Recognition (ICPR)

VisionTrap: Vision-augmented Trajectory Prediction Guided by Textual Descriptions 2024

Seokha Moon, Hyun Woo, Hongbeen Park, Haeji Jung, Reza Mahjourian, Hyung-gun Chi, Hyerin Lim, Sangpil Kim and Jinkyu Kim

We introduce a novel approach incorporating visual features from surround-view cameras and textual descriptions for trajectory prediction.

European Conference on Computer Vision (ECCV)

Learning Temporal Cues by Predicting Objects Move for Multi-camera 3D Object Detection 2024

Seokha Moon, Hongbeen Park, Jaekoo Lee, and Jinkyu Kim

We propose a Detection After Prediction (DAP) method to explicitly learn the temporal cues.

IEEE International Conference on Robotics and Automation (ICRA)

BEVMap: Map-Aware BEV Modeling for 3D Perception 2024

Mincheol Chang, Seokha Moon, Reza Mahjourian and Jinkyu Kim

IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)

Enhancing Trajectory Prediction Accuracy with Goal Location and Lane Information 2023

Seokha Moon and Jinkyu Kim

We introduce a method to predict the goal location and interact with lane to navigate towards the predicted goal.

Conference on The Institue of Electronics and Information Engineers (IEIE)

Oral

RUFI: Reducing Uncertainty in behavior prediction with Future Information 2023

Seokha Moon, Sejeong Lee, Hyun Woo, Kyuhwan Yeon, Hayoung Kim, Seong-Gyun Jeong, and Jinkyu Kim

IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshop on Vision-Centric Autonomous Driving

ORA3D: Overlap Region Aware Multi-view 3D Object Detection 2022

Wonseok Roh, Gyusam Chang, Seokha Moon, Giljoo Nam, Chanyoung Kim, Younghyun Kim, Jinkyu Kim and Sangpil Kim

British Machine Vision Conference (BMVC)

Teaching

Mathmatics for Computer Science (COSE111) Spring 2024

Algorithm (COSE214) Fall 2023

Algorithm (COSE214) Fall 2022

Honors And Awards

First Prize of Computer Science, Yonsei University Aug. 2021

HUAWEI scholarship, Talent Development Foundation Nov. 2020

Skills

Languages: C++, C, Python, JavaScript

FRAMEWORKS & TOOLS: PyTorch, OpenCV, TensorFlow, Git, Visual Studio, XCode