

LOUIS SUNGWOO CHO

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EDUCATION

University of Illinois at Urbana-Champaign, Grainger College of Engineering	August 2020 – May 2025
M.S. in Civil Engineering (Transportation)	GPA: N.A / 4.00
B.S. Honors in Civil Engineering (Transportation), Minor in Computer Science	GPA: 3.55/4.00

EXPERIENCES

Graduate Research Assistant: Smart City Laboratory at UIUC	July 2024 – May 2025
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- Pursuing M.S in Civil Engineering (Transportation) by conducting research related to autonomous vehicles advised by Professor Alireza Talebpour in the Department of Civil and Environmental Engineering.
- Optimizing parameters for control spacing models such as constant spacing, constant time headway, traffic flow stability, constant safety factor, and intelligent driver model for Adaptive Cruise Control (ACC) vehicles by calibrating the genetic algorithm.
- Applying multi-agent deep reinforcement learning for trajectory planning for efficient and safe car-following and lane-changing behaviors of self-driving vehicles.
- Leveraging Robot Operating System (ROS) to simulate and test planning and control algorithms, analyzing the physical vehicle dynamics in real-time at the Illinois Center for Transportation in Rantoul, IL.
- Conduct an in-depth exploratory data analysis of the Waymo Open Dataset to analyze the lane-changing and car-following behaviors of autonomous and human-driven vehicles.

Undergraduate Research Assistant: Smart City Laboratory at UIUC	August 2023 – May 2024
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- Developed a trajectory re-identification algorithm using convolutional social pooling to improve safety in driving under low visibility conditions.
- Performed simulations in various uncertain low visibility conditions to further optimize trajectory re-identification prediction algorithm to ensure safe vehicle maneuvers.
- Participated in research on integrating GPT and deep reinforcement learning sequence-based framework for traffic state space shaping.

Undergraduate Researcher: Human-Centered Autonomy Laboratory at UIUC	January 2023 – May 2023
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- Collaborated with Professor Katherine Driggs-Campbell in the Department of Electrical and Computer Engineering and other undergraduate students to advance the development of the end-to-end autonomous driving model utilizing the TransFuser model.
- Explored advanced computer vision and reinforcement learning techniques to significantly enhance the performance and accuracy of TransFuser neural networks.

Research Assistant: Reliable Autonomy Group at UIUC	May 2022 – August 2022
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- Collaborated closely with Professor Sayan Mitra in the Department of Electrical and Computer Engineering on AutoVerse-AI Simulation Research for Control Verification. Contributed significantly to the development of advanced simulation tools to ensure the reliability and safety of autonomous vehicle control systems. [Code link]
- Developed robust parsing functions to visualize and replicate road geometry from ASAM OpenDRIVE files, enhancing the agents' control verification simulation's precision.

EXTRACURRICULAR ACTIVITIES

Graduate Representative: Institute of Transportation Engineers UIUC Chapter	January 2025 – May 2025
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- Organized informal gatherings and meetings with undergraduate and graduate students.
- Mentor prospective undergraduate students who are interested in graduate school.

President: Institute of Transportation Engineers UIUC Chapter (ITE@UIUC)	August 2022 – May 2024
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- Organized and moderated conferences and panels on topics such as autonomous and electric vehicles, Intelligent Transportation Systems (ITS), CAV Infrastructure, public transit, high-speed rail, and bus rapid transit (BRT) connecting students with top industry professionals.
- Led a team of 6 students to analyze public transit data using machine learning algorithms, presenting findings at

the UIUC Engineering Open House (EOH).

- Mentored Civil Engineering in Transportation and Computer Science students, assisting with curriculum planning and coursework selection.
- Volunteered at the Illinois Traffic Engineering Safety (TES) Conference and the Illinois Transportation Highway Engineering (THE) Conference.
- Represented ITE@UIUC in the UIUC Engineering Council, promoting diversity and participating in community volunteering such as Robotics competition and major networking events with the school deans.

AWARDS AND RECOGNITIONS

Bachelor of Science Honors

May 2024

Students receive the Honors designation if they have a cumulative University of Illinois at Urbana-Champaign grade-point average of at least 3.5 at graduation (A = 4.0).

UIUC EOH 2024 Outstanding Exhibit Award 3rd Place

April 2024

ITE@UIUC was awarded the “Outstanding Exhibit Award” in 3rd place for demonstrating what “Mobility for Our Future” will look like during the UIUC Engineering Open House 2024. CAD design of new high-speed rails, Maglev, eVTOL, unmanned aerial vehicles (UAV), bus rapid transit (BRT), and data visualization using AI for time-series forecasting on public transit planning were exhibited.

Grant W. Shaw Memorial Scholarship

March 2023

Scholarship award for students demonstrating the best leadership in Traffic Engineering awarded by faculty members in the Transportation area of the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign and the Schaumburg Chapter of the Illinois Association of Highway Engineers.

Dean's List

May 2022

The Dean's List is given to honor full-time students whose grade point average (GPA) for that semester ranks in the upper 20 percent of their college every semester at the University of Illinois at Urbana-Champaign.

SKILLS

Programming Languages: Python, Java, C++, HTML, CSS, JavaScript, ReactJS, MySQL, MongoDB, NodeJS, Neo4j, MATLAB

Tools: Git, ROS, Docker, LaTeX, Microsoft Excel, Word, PowerPoint, AutoCAD, Revit

Languages: English, Korean