Esteban Rivera

Munich
Germany
+49 0176 841 598 66
es.rivera1202@gmail.com

I am a PhD Student working in efficient computer vision for autonomous driving. I have experience transforming research ideas into real projects.

Education

9/2022- Current — **PhD**, *Technical University of Munich*, Munich, Germany.
- Data-efficient perception for autonomous driving
- VLMs for automated scenario classification and automated pointcloud labeling
- Active learning for 3D perception

4/2017- 10/2019 — **M.Sc. Electronic Engineering**, *Karlsruhe Institute of Technology*, Karlsruhe, Germany, Grade: 1.7.

01/2011- 12/2015 — **B.Sc. Electronic Engineering**, *Universidad de los Andes*, Colombia, Final grade 4.16/5.0, Ranking: Top 25%.

01/2012- 06/2016 — **B.Sc. Physics**, *Universidad de los Andes*, Colombia, Final grade 4.16/5.0 Ranking: Top 25%.

Work Experience

10/2022- Current — **Research Associate**, *Technische Universität München*.
Munich, Germany
EDGAR Project: Autonomous Driving for urban traffic
- Responsible for Camera/LiDAR-based object detection
- Trained 3D detection module led to 0 disengagements in 20KM urban route.
- Recorded and prepared a 20TB database of rosbags and sensor data for autonomous driving
- Developed an autolabeling pipeline for 3D pointclouds based on Pytorch

11/2019- 08/2022 — **Machine learning Scientist**, *Appgate Inc.*
Bogota, ColombiaDeveloped deep learning-based projects for cybersecurity applications implemented on thousands of devices
- Biometric authentication
- Biometric spoofing detection
- VPN spoofing detection

04/2017- 10/2019 — **Research assistant**, *Forschung Zentrum Informatik*.
Karlsruhe, Germany
Developed a driving scenario representation for scalable data analytics with Neural Networks

09/2018- 03/2019 — **Intern**, *IAV GmbH*.
Gifhorn, Germany
Deep Learning for object recognition:
- Developed deep-learning-based object detector and implemented it into an automated tractor

Language and IT Skills

Languages	English C1, German C1, Spanish Native
Programming	Python
Packages	Pytorch, MMDetection3D, ROS2, Docker, Rerun, OpenPCDet, Keras, Pandas, OpenCV
Services	AWS, Slurm

Patents

08/2021 **US Patent**, *Keyboard and mouse based behavioral biometrics to enhance password-based login authentication using machine learning model*, Application number: 16798084.

Publications

Conferences

E. Rivera, S. Prabhakaran, and M. Lienkamp, "Heal3d: Heuristical-enhanced active learning for 3d object detection," in *CVPRW 2025, LXCV*, June 2025.

E. Rivera, J. Lübberstedt, N. Uhlemann, and M. Lienkamp, "V3lma: Visual 3d-enhanced language model for autonomous driving models," in *CVPRW 2025, DriveX*, June 2025.

E. Rivera, L. Stratil, and M. Lienkamp, "Inconsistency-based active learning for lidar object detection," in *IEEE Intelligent Vehicles Symposium (IV)*, June 2025.

E. Rivera, J. Lübberstedt, N. Uhlemann, and M. Lienkamp, "Scenario understanding of traffic scenes through large visual language models," in *WACVW 2025, LLVLM-AD Workshop*, Feb. 2025.

E. Rivera, A. Serra, and M. Lienkamp, "Camera-lidar inconsistency analysis for active learning in object detection," in *IEEE Intelligent Vehicles Symposium (IV)*, Apr. 2024.

C. Lopez, J. Solano, E. Rivera, L. Tengana, and M. Ochoa, "Adversarial attacks against mouse-and keyboard-based biometric authentication: Black-box versus domain-specific techniques," *International Journal of Information Security*, June 2022.

S. Huch, L. Scalerandi, E. Rivera, and M. Lienkamp, "Quantifying the lidar sim-to-real domain shift: A detailed investigation using object detectors and analyzing point clouds at target-level," *IEEE Transactions on Intelligent Vehicles*, Mar. 2023.

J. Solano, E. Rivera, L. Tengana, C. Lopez, and M. Ochoa, "A siamese neural network for scalable behavioral biometrics authentication," in *International Conference on Applied Cryptography and Network Security (ACNS)*, June 2022.

E. Rivera, A. Castelblanco, L. Tengana, J. Solano, C. Lopez, and M. Ochoa, "Dynamic face authentication systems: Deep learning verification for camera close-up and head rotation paradigms," *Computers and Security*, Apr. 2022.

L. Tengana, J. Solano, A. Castelblanco, E. Rivera, C. Lopez, and M. Ochoa, "Centy: Scalable server-side web integrity verification system based on fuzzy hashes," in *Detection of Intrusions and Malware, and Vulnerability Assessment: DIMVA*, July 2021.

E. Rivera, L. Tengana, J. Solano, A. Castelblanco, C. López, and M. Ochoa, "Risk-based authentication based on network latency profiling," in *ACM Workshop on Artificial Intelligence and Security (AISec'20)*, Nov. 2020.

J. Solano, C. Lopez, E. Rivera, A. Castelblanco, L. Tengana, and M. Ochoa, "Scrap: Synthetically composed replay attacks vs. adversarial machine learning attacks against mouse-based biometric authentication," in *ACM Workshop on Artificial Intelligence and Security (AISec'20)*, Nov. 2020.

M. Lücking, E. Rivera, L. Kohout, C. Zimmermann, D. Polad, and W. Stork, "A video-based vehicle counting system using an embedded device in realistic traffic conditions," in *2020 IEEE 6th World Forum on Internet of Things (WF-IoT)*, June 2020.

A. Castelblanco, J. Solano, C. Lopez, E. Rivera, L. Tengana, and M. Ochoa, "Machine learning techniques for identity document verification in uncontrolled environments: A case study," in *Mexican Conference in Patter Recognition (MCPR)*, June 2020.