SANDER TONKENS

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EDUCATION

University of California, San Diego April 2026 (Expected)
Doctor of Philosophy (Ph.D.) - Mechanical and Aerospace Engineering
Thesis Title: Bridging the Gap: Scaling Hamilton-Jacobi Safety analysis for real-world deployment (4.0 GPA).

Stanford University December 2020
M.S. in Mechanical Engineering (4.0 GPA); Focus: Robotics, Mechatronics, and Machine Learning.

École Polytechnique Fédérale de Lausanne (EPFL) July 2017
B.Sc. in Mechanical Engineering (5.4 / 6.0 GPA); Focus: Mathematics, Controls & Aerodynamics.

EXPERIENCE

Autonomous Systems Laboratory - Stanford University October 2025 - Present
Visiting Research Scholar - PI: Prof. Marco Pavone *Stanford, CA*
- Deploying automated task failure analysis & red teaming to accelerate robot foundation model data flywheel.
- Built a fully autonomous, safe data collection pipeline for Franka manipulators with VLA model backbone.

NVIDIA July 2023 - March 2024
Autonomous Vehicles Research Group - Research Intern *Santa Clara, CA*
- Engineered a robust policy planner that mitigates uncertainty during complex multi-agent interactions.
- Shipped a transformer-based multi-modal prediction module to the production stack, capturing complex driving behaviors.

Safe Autonomous Systems Laboratory - UC San Diego September 2021 - Present
Graduate Student Researcher - PI: Prof. Sylvia Herbert *La Jolla, CA*
- Thesis work unlocked real-time guaranteed safety for high-dimensional systems in changing environments.
- Founding member: Architected and deployed the lab's hardware, compute, & testing platforms from scratch.
- Directed & managed technical execution of 9 researchers across multiple award-winning technical initiatives.

Control Systems Tech. Group - Eindhoven University of Technology March 2021 - July 2021
Research Assistant - PI: Dr. Ir. Mauro Salazar *Eindhoven, The Netherlands*
- Architected a predictive control framework to inform government COVID-vaccine distribution policy.
- Optimization and system ID results led to National Health Institute (RIVM) grant funding 2 post-docs.

Autonomous Systems Laboratory - Stanford University September 2019 - January 2021
Research Assistant - PI: Prof. Marco Pavone *Stanford, CA*
- Engineered state-of-the-art control stack for soft robots, achieving real-time trajectory tracking on hardware.
- Laid the technical foundation & hardware testbed for a research stream yielding 11 publications and 2 grants.

Auris Health June 2019 - September 2019
Controls & Robotics Intern *Redwood City, CA*
- Developed improved nonlinear dynamics model of next-generation teleoperated flexible endoscope for novel treatments leading to 5x improvement in end-effector position control (future iteration in production).

McKinsey & Company April 2018 - August 2018
Business Analyst Intern *Geneva, Switzerland*
- Developed strategy and modeled ROI of generic drug treatment accessibility incentive in Sub-Saharan Africa.

LM Wind Power September 2017 - April 2018
R&D Engineering Intern *Kolding, Denmark*
- Prototyped a computer vision-enabled mobile robot to inspect the interior of turbine blades; deployed on-site.

CAREER MILESTONES

First author of 10+ papers in top robotics & ML venues (T-RO, ICRA, CoRL, ICLR). Selected publications:
- From Space to Time, *Conference on Robot Learning (CoRL)*, 2025.
- Categorical Traffic Transformer, *IEEE Conference on Robotics and Automation (ICRA)*, 2025.
- Inventor on 2 autonomous driving patents focused on planning-informed prediction.

Awards: ONR NISE Fellow (2024-2026), Netherlands-America Foundation Graduate Fellowship (2018).
10+ seminar and keynote talks at symposiums & organized RSS workshop in 2025.

SKILLS

Programming: Python, Julia, C/C++, Rust, Docker. **Learning & Robotics**: ROS (1&2), PyTorch, JAX, MuJoCo, ISAAC Sim. **Design**: CATIA, Solidworks. **Languages**: Dutch (native), English, French (Fluent).