Adrià López Escoriza

(+41) 76 720 55 89 | alopez@ethz.ch | Linkedin | GitHub

EDUCATION

ETH Zürich Sep. 2021 – March 2024

MSc Robotics, Systems & Control (RSC), GPA: 5.65/6 *Zürich, Switzerland*

- Ongoing project: Master's Thesis on World Models for Reinforcement Learning.
- Relevant Courses completed (28 ECTS): Large Language Models, Machine Perception, Game Theory and Control, Deep Learning, Planning and Decision Making, Vision Algorithms for Mobile Robotics.
- Semester project at Ascento Robotics Company (ARC): GPS waypoint following system for landfill inspection.

Universitat Politécnica de Catalunya Sep. 2017 – July 2021

BSc in Telecommunications Engineering (ETSETB), GPA: 8.27/10 (Top 8%) *Barcelona, Spain*

- Bachelor Mobility Program at Electrical Engineering (ITET) Department of ETH Zürich.
- Total Credits ECTS of the program: 240. All credits obtained on first call.
- Main focus on signal processing, communication systems and electronic control.
- Honours in: Physics, Electromagnetism, Signals & Systems, Radiation & Propagation, Audiovisual & Communications Signal Processing & Bachelor's Thesis.

RELEVANT EXPERIENCE

Chain of Thought World Models for RL Aug. 2023 – Present

VIS, CVL, ETH | Master Thesis, Reinforcement Learning, Visual Intelligence *Zürich, Switzerland*

- Design and implement a CoT World Model, incorporating short-term prediction and key frame forecasting.
- Develop a goal-conditioned reinforcement learning framework using the Chain of Thought World Model.
- Evaluate the performance of the proposed model in comparison to traditional world models in long-horizon planning and control tasks.

Motion Planning Intern Sep. 2022 – April 2023

Motional | Autonomous driving, High-level Planning *Singapore, Singapore*

- Bench-marking of pre-existing planning pipeline to find bottlenecks in scenarios with several dynamic obstacles.
- Design and prototype new behavioral planning pipeline to incorporate complex lane structure information.
- Presentation and deployment of new planning system onto main software stack.

GPS Waypoint following March 2022 – July 2022

ARC, ETH | State estimation, Control, ROS *Zürich, Switzerland*

- Full autonomous pipeline for carrying out waypoint following missions.
- Sensor fusion of odometry and GPS measurements and control algorithm in ROS.

Estimation Module Lead Sep. 2021 – June 2022

AMZ Driverless | Autonomous Racing, ROS, C++ *Zürich, Switzerland*

- Lead of the estimation module (4 members), in charge of state estimation and SLAM.
- Coordination between different modules to design a robust global autonomous stack.
- Design of an autonomous racing car from scratch to compete in Formula Student 2022 competitions.

State Estimation Responsible Sep. 2020 – Sep. 2021

AMZ Driverless | Autonomous Racing, Velocity Estimation, Python, C++ *Zürich, Switzerland*

- Design and implementation of state of the art Kalman Filter for ego motion estimation at high speed conditions.
- Implantation of safety and redundancy systems for low level autonomous system control in a driverless racing car.
- 1st place in Daimler AI Award for having the most innovative and practical AI solutions for autonomous driving.
- 3rd overall place in Driverless category + 2nd place in design category at Formula Student Germany.

Simultaneous Localisation And Mapping Sep. 2019 – Sep.2020

BCN eMotorsport | Autonomous Racing, SLAM, ROS, C++ *Barcelona, Spain*

- Study and comparison of different SLAM algorithms for its implementation in a Formula Student Driverless car.
- Design of online SLAM system from LiDAR observations and raw GPS data.
- Implementation in C++ leading to the first ever mapping algorithm implemented in a Spanish autonomous car.

Publications

[KNet for Velocity Estimation](#) | *Autonomous driving, Velocity Estimation*   Feb. 2021 – Aug. 2021
- Published at the International Conference on Autonomous Systems ([ICAS](#)) 2021.
- Work done in collaboration with the Signal and Information Laboratory ([ISI](#)) at ETH Zurich and [AMZ Driverless](#).
- Implementation of KalmanNet in a real autonomous racing car with the intention to simplify the sensor setup.
- Deployment of KalmanNet in an ETAS Electronic Control Unit embedded in the autonomous race car.

[KalmanNet](#) | *State estimation, Deep learning, RNNs*   Oct. 2020 – Feb. 2021
- Published in Transactions of Signal Processing ([TSP](#)) - 100+ citations.
- Contributed in the development and evaluation of a learning based approach to non linear state estimation.
- Comparing the system vs traditional state estimation techniques such as Extended Kalman Filter.
- Semester Project in the Signal and Information Laboratory ([ISI](#)) at ETH Zurich.

Relevant Course Projects

Artificial Intelligence: Bayesian Neural Networks for medical diagnosis. Bayesian Optimization for neural network design. Actor Critic RL agent for moon lander simulation.
Computer Vision: Transformer-based 3D human pose recognition. Visual odometry pipeline for vehicle localisation. Disentangling controls in GANs via kernel PCA for image synthesis.
Natural Language Processing: Theoretical study on LLM capabilities. Performance analysis of different models on reasoning tasks (GSM8K dataset).
Motion Planning: Planning + Control of a bi-thrust spacecraft in a virtual dynamic environment. Dynamic programming for drone delivery in stochastic state space. MPC for autonomous driving.

Awards

Formula Student Germany 3rd place overall: Driverless category with AMZ Driverless.
Daimler AI Award 1st place: Best use of AI algorithms for autonomous driving.
Bachelor Thesis Honours: Maximum grade awarded by the committee at Universitat Politécnica de Catalunya.
XXIV National Mathematics Olympiad Champion: 1st place in [Spanish Mathematics Olympiads](#) group cathegory.
Andorra Mathematics Olympiad Champion: 1st place in [Andorran Mathematics Olympiads](#).

Technical Skills

Programming Languages: C++(7/10), Python (7/10), C (5/10), Java (5/10)
Relevant Frameworks: PyTorch, Eigen, ROS
Other Tools: Git, Bazel, CMake

Language Skills

Spanish, Catalan: Native Speaker   **English**: C2 level   **French**: C1 level   **Italian**: B2 level

Extracurricular experience

Teaching Assistant   Sep. 2023 – Jan. 2024
[Automatic Control Lab](#) (ETH) | *Teaching Assistant for the course Game Theory And Control*   *Zürich, Switzerland*
Primary School Robotics Teacher   Sep. 2018 – July 2019
[CreaTic Academy S.L.](#) | *Robotic workshops for students aged from 8 to 14*   *Barcelona, Spain*
Construction volunteer   June 2018 – Aug. 2018
[Vertical Ascent](#) | *Construction of an orphanage in the outskirts of Pokhara*   *Sarangkot, Nepal*

Other Courses

Imperial College of London   June 2017 – July 2017
Physics pre-college course   *London, UK*

University of California Los Angeles (UCLA)   June 2016 – July 2016
Debate and Public speaking   *Los Angeles, CA*

Interests and hobbies

Alpine skiing, Alpinism, Tennis, Surfing