JACOPO SERAFIN

Roboticist & ML Expert

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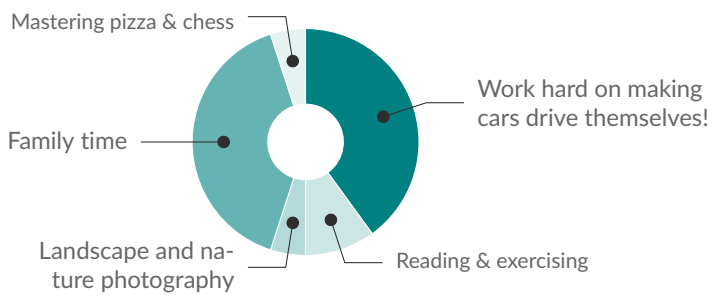
A WEEK OF MY LIFE



EXPERIENCE

Sr. Engineering Manager L6, Behavior — Woven by Toyota

2024 – Ongoing | Ann Arbor, MI, USA

- Tech lead & manager for ML tracking (until end '24), and ML prediction
- Guided the ML tracker team through the unification with ML detection, that led to a joint model improving performance, and teams' efficiency
- Led the ML prediction team to deploy multiple improvements, including, the multi-hypothesis outputs, map awareness, and the use of SD maps
- Owner of the Behavior department's data roadmap. Responsible to define and drive the entire data strategy toward year+ out production deadlines, that both ML prediction and ML planner should rely on

Engineering Manager L5, Perception — Woven by Toyota

2022 – 2024 | Ann Arbor, MI, USA

- Tech lead & manager of ML tracking, and ML prediction (since end '22)
- Led the tracking team to overhaul the ML object tracker and move from a lidar based ML tracker, to a mono vision ML tracker, running on constrained hardware and dealing with quantization requirements
- Responsible to manage the teams and their processes, negotiate with stake holders, create quarter & year roadmaps, and presenting periodically progress, results and accomplishments against the company goals
- Active team member contributor as the owner of the data requirements for the ML tracker. Managing in the role negotiations and data submissions with the annotators, and being responsible for the data sampling strategy as well as the data curation pipeline of the ML tracker
- Led successfully the ML prediction team to a complex unification with the ML planner, resulting in the two teams sharing the backbone and the data infrastructure, boosting both teams' efficiency, nimbleness and at the same time moving a step closer to the joint model

Manager L5, Perception — Toyota Research Institute

2020 – 2022 | Ann Arbor, MI, USA

- Manager of 5 people in perception, across multiple teams. Focusing on coaching them and creating the right opportunities, ultimately leading to 1 promotion and consistent good or above expectation performance
- Tech leader of the object tracking team for another year, during which the tracker has been extended to use more data driven inputs
- Active contributor to the object tracker through the addition, among others, of ICP covariance estimation, and ICP based data association

LIFE PHILOSOPHY

"If I have the belief that I can do something, I shall surely acquire the capacity to do it, even if I may not have it at the beginning."

MOST PROUD OF

Courage I had
to take on subjects outside my comfort zone / area of expertise

Persistence & Loyalty
I showed despite the hard moments and my willingness to stay with Toyota after the transition to Woven

MI Tracker & ML Prediction
model improvements achieved over time since deploying the v0s back in 2022

STRENGTHS

Hard-working | Resilient | Agile | Motivator & Leader | Collaborative

Robotics | Deep Learning | Data | C/C++ | Python | Rust | ROS | Git

LANGUAGES

English
Italian

EDUCATION

PhD in Computer Science (ISCED 8)

Sapienza University of Rome

2013 – 2017 | Rome

MSc in Artificial Intelligence & Robotics (ISCED 7) — Sapienza University of Rome

2011 – 2013 | Rome

BSc in Computer Science (ISCED 6)

Sapienza University of Rome

2007 – 2010 | Rome

Research Scientist L4, Perception **Toyota Research Institute**

2017 – 2020 Ann Arbor, MI, USA

- Active member, contributor and (after a couple years) tech lead of the object tracking team
- Full bring up from scratch of a probabilistic multi object, multi modal (lidar, camera, radar) tracking framework using factor graphs optimizations. The tracker was used consistently in the vehicles, and it proved successful in delivering a number of demos with multiple VIPs from Toyota Motor Corporation.

PUBLICATIONS

Journal Articles

- J. Serafin and G. Grisetti, "Using Extended Measurements and Scene Merging for Efficient and Robust Point Cloud Registration," *Robotics and Autonomous Systems (RAS)*, 2017.

Conference Proceedings

- R. Goeddel, C. Kershaw, J. Serafin, and E. Olson, "FLAT2D: Fast Localization from Approximate Transformation into 2D," in *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, Daejeon, Korea, 2016.
- J. Serafin, E. Olson, and G. Grisetti, "Fast and Robust 3D Feature Extraction from Sparse Point Clouds," in *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, Daejeon, Korea, 2016.
- R. Capobianco, J. Serafin, J. Dichtl, G. Grisetti, L. Iocchi, and D. Nardi, "A Proposal for Semantic Map Representation and Evaluation," in *Proc. of the European Conference on Mobile Robots (ECMR)*, Lincoln, United Kingdom, 2015, pp. 1–6. DOI: 10.1109/ECMR.2015.7324198.
- J. Serafin and G. Grisetti, "NICP: Dense Normal Based Point Cloud Registration," in *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, 2015, pp. 742–749. DOI: 10.1109/IROS.2015.7353455.
- J. Serafin and G. Grisetti, "Using Augmented Measurements to Improve the Convergence of ICP," in *Proc. of the Int. Conf. on Simulation, Modeling and Programming for Autonomous Robots (SIMPAR)*, Bergamo, Italy: Springer, 2014, pp. 566–577. DOI: 10.1007/978-3-319-11900-7_48.
- V. A. Ziparo, D. Calisi, G. Grisetti, *et al.*, "A User Perspective on the ROVINA Project," in *Proc of the 18th ICOMOS General Assembly and Scientific Symposium "Heritage and Landscape as Human Values"*, Florence, Italy, 2014, pp. 578–582. [Online]. Available: http://jacoposerafin.com/wp-content/uploads/rovina14icomos.pdf.
- I. Bogoslavskyi, O. Vysotska, J. Serafin, G. Grisetti, and C. Stachniss, "Efficient Traversability Analysis for Mobile Robots using the Kinect Sensor," in *Proc. of the European Conference on Mobile Robots (ECMR)*, Barcelona, Spain, 2013, pp. 158–163. DOI: 10.1109/ECMR.2013.6698836.
- V. Ziparo, M. Zaratti, G. Grisetti, *et al.*, "Exploration and mapping of catacombs with mobile robots," in *IEEE Int. Symposium on Safety, Security, and Rescue Robotics (SSRR)*, Linköping, Sweden, 2013, pp. 1–2. DOI: 10.1109/SSRR.2013.6719380.

CERTIFICATIONS

Intro to Self-Driving Cars, *by Sebastian Thrun* [certificate] **Udacity**

2021

Deep Learning, *by Andrew Ng* [certificate] **Coursera**

2019

READ & APPLIED

Neural Networks and Deep Learning ***by Nielsen***

Deep Learning Illustrated ***by Krohn, Beyleveld, and Bassens***

Probabilistic Robotics ***by Thrun, Burgard, and Fox***

Effective Modern C++ ***by Meyers***

How to Win Friends and Influence People ***by Dale***

The Phoenix Project ***by Kim, Behr, and Spafford***

The Coaching Habit ***by Stanier***

The Advice Trap ***by Stanier***

Light on the Landscape: Photographs and Lessons from a Life in Photography ***by Neill***

How to Win at Chess ***by Rozman***