Ramona E. Stefanescu | Roboticist

Palo Alto, CA

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Experience

Supernal   **Fremont, CA**
Research Manager   *2020–Present*

- Led a multidisciplinary team of researchers, engineers, and scientists in the development of autonomous systems for flying aerial taxis.
- Proposed various novel solutions to the sim-to-real problem for multiple autonomy functions such control, trajectory and path planning, mapping and localization, decision-making under uncertainty.
- Tested and integrated novel SLAM methods for mapping and localization such as Gaussian Splatting- and NeRF-SLAM.
- Improved state-of-art methods such as Soft Actor-Critic by using a more generalized entropy formulation, and implemented learning-based methods for Adaptive Informative Path Planning which enabled efficient data gathering of initially unknown environments.

Samsung Inc.   **Santa Clara, CA**
Sr. Staff Simulation Engineer   *2018–2020*

- Developed sophisticated, intelligent behavior models for real-world traffic within a simulation environment, with the goal of generating complex scenarios at scale. Proposed a hybrid model for dynamic agents in a simulation environment by using a model-based approach and Reinforcement Learning methods.
- Introduced a Generative Adversarial Imitation Learning (GAIL) for policy extrapolation. The policy was mapped into a trajectory and sent to the discriminator with the goal to generate human-like behavior.

Cyngn   **Palo Alto, CA**
Team Lead Localization   *2017–2018*

- Implemented a pipeline for Simultaneous Localization and Mapping (SLAM) using visual and LiDAR odometry, inertial measurements and map information. Employed nonlinear and graph-based estimation techniques.
- Developed a Deep Q-Network (DQN) agent to perform the task of autonomous driving in a simulator, by using hand-crafted features in conjunction with a linear parameterization of the policy and value function.

Future Mobility   **Sunnyvale, CA**
Autonomous Driving Localization System Lead   *2016–2017*

- Formulated and implemented localization and mapping algorithms to enable Level 4 autonomous driving. Responsible for building highly efficient, large-scale, distributed data processing pipeline for mapping and localization.
- Implemented route planning algorithms based on graph, sampling and artificial potential fields.

Mercedes-Benz R&D   **Sunnyvale, CA**
Software Engineer, Autonomous Driving   *2015–2016*

- Designed algorithms such as visual inertial odometry, dead reckoning, map matching and data association for mapping and localization. Evaluated different loosely and tightly coupled systems and integrated an Interacting Multiple Model (IMM) for a more accurate state estimation.
- Addressed the problem of fast emulator construction by developing novel strategies for computationally expensive simulations. Used a combination of efficient sparse representation of simulation data with graph theory, low-rank approximation and multilevel-multiscale methodologies.

Education

University at Buffalo   **Buffalo, NY**
Ph.D. in Mechanical Engineering   *09/2014*
Relevant coursework: Optimal and learning-based Control, Optimization, Machine Learning, Computer Vision.

University at Buffalo   **Buffalo, NY**
M.S. in Mechanical Engineering   *02/2012*
Relevant coursework: High Performance Computing, Computational Mechanics, Functional Analysis.

Politehnica University   **Bucharest, RO**
B.S. in Mechanical Engineering   *07/2007*
Relevant coursework: Robotics, AI, Control Theory. **Graduated Class Valedictorian.**

Hyperion University   **Bucharest, RO**
B.S. in Computer Science   *07/2004*
Relevant coursework: Data Structure, Algorithms, Signal Processing.

Technical Skills

- Optimization and ML, Deep RL, Computer Vision and vSLAM, Foundation Models, Search Methods, Probabilistic Graphical Models.
- C/C++, Python.

Honors and Awards

- NSF i-CORPS (National Innovation) Award.
- Stanford: Artificial Intelligence Certificate. Harvard: People Focus Organizations.
- Erasmus Scholarship at GMIT, Ireland – Digital & Software System Engineering.

Patents

- Hybrid models for dynamic agents in a simulation environment, US US20210056863A1, Filed Sep 18, 2019.
- System and method to integrate a dynamic model for agents in a simulation environment using a deep Koopman model, US20210081808A1, Filed Sep 19, 2019.
- Vehicle localization, US20200150280A1, Granted June 06, 2022.