AA 174A: Principles of Robot Autonomy I

Paper Review

Due: December 12th

Students enrolled for 4 units in this class are required to submit a final paper report. This assignment is designed to assess your understanding and critical analysis of a selected research paper.

Your submission should consist of a paragraph (roughly half a page) that summarizes the key contributions of the paper.

The report must be submitted by **December 12th**. Late submissions will not be accepted.

Select a paper from the following list:

Trajectory Tracking and Control

1. Real Time Trajectory Generation for Differentially Flat Systems. M. van Nieuwstadt, R.M. Murray.
2. Contributions to the Theory of Optimal Control. R.E. Kálmán.
3. Control Barrier Functions: Theory and Applications. A.D. Ames, S. Coogan, M. Egerstedt, G. Notomista, K. Sreenath, P. Tabuada.

Motion Planning

1. Optimal and Efficient Path Planning for Partially-Known Environments. A. Stentz.
2. Probabilistic Roadmaps for Path Planning in High-Dimensional Configuration Spaces. L.E. Kavraki, P. Švestka, J.-C. Latombe, M.H. Overmars.
3. Sampling-based Algorithms for Optimal Motion Planning. S. Karaman, E. Frazzoli.
4. Fast Marching Tree: A Fast Marching Sampling-Based Method for Optimal Motion Planning in Many Dimensions. L. Janson, E. Schmerling, A. Clark, M. Pavone.

Perception (Computer Vision and Deep Learning)

1. Object Recognition from Local Scale-Invariant Features. D.G. Lowe.
2. Random Sample Consensus: A Paradigm for Model Fitting With Applications to Image Analysis and Automated Cartography. M.A. Fischler, R.C. Bolles.

3. ImageNet Classification with Deep Convolutional Neural Networks. A. Krizhevsky, I. Sutskever, G.E. Hinton.

4. A Simple Framework for Contrastive Learning of Visual Representations (SimCLR). T. Chen, S. Kornblith, M. Norouzi, G. Hinton.

State Estimation and Filtering

1. Novel Approach to Nonlinear/Non-Gaussian Bayesian State Estimation. N.J. Gordon, D.J. Salmond, A.F.M. Smith.

2. The Unscented Kalman Filter for Nonlinear Estimation. E.A. Wan, R. van der Merwe.

3. New Results in Linear Filtering and Prediction Theory. R.E. Kalman, R.S. Bucy.

4. Sequential Monte Carlo: A Unified Review. A.G. Wills, T.B. Schön.