

## Video H: A Cascaded Filter Approach to Multi-Objective Control using the Segway RMP

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### Abstract

In this video we demonstrate our novel filter cascade method using the Segway Robotic Mobility Platform (RMP), a dynamically stable, differential drive mobile platform equipped with a laser range finder and a camera. The filter cascade method employs individual filters that take a set of motor commands and select those that meet or make the most progress towards that filter's objectives. By applying these filters successively, a prioritization of the different objectives can be achieved [2]. The global dynamic window approach [1] for avoiding initially unknown dynamic obstacles and visually guided person following using a mean shift tracker employing color histograms are also demonstrated.

- [1] O. Brock and O. Khatib. High-speed navigation using the global dynamic window approach. In *Proceedings of the International Conference on Robotics and Automation (ICRA)*, pages 341-346, Detroit, MI, 1999.
- [2] B. J. Thibodeau, S. W. Hart, D. R. Karuppiah, J. D. Sweeney, and O. Brock. Cascaded filter approach to multi-objective control. In *Proceedings of IEEE International Conference on Robotics and Automation (ICRA)*. IEEE, 2003.