The Field Robotics Center

Seminar Series

July 31 **NSH 1507** **2PM – 3PM**

Food and Drinks will be served

Davide Scaramuzza
Robotics and Perception Group
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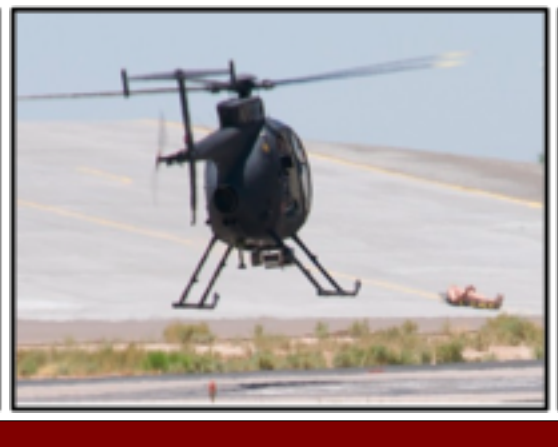
Towards Agile Flight of Vision-controlled Micro Flying Robots: from Frame-based to Event-based Vision

Abstract: In the last two years, we have heard a lot of news about Micro Aerial Vehicles (MAVs), in the form of small quadrotors. Quadrotors have numerous advantages over ground vehicles: they can easily reach environments that no human can access and have more agility and navigational capabilities than ground vehicles. Unfortunately, their dynamics makes them extremely difficult to control and this is particularly true in absence of external positioning systems, such as GPS and motion-capture systems. Additionally, autonomous maneuvers based on onboard sensors are still very slow compared to those attainable with motion capture systems, such that innovative sensors for mobile robotics are needed. In this talk, I will give an overview of my research activities on visual navigation of MAVs and collaboration between ground and aerial vehicles, from slow navigation (using standard frame-based cameras) to agile flight using event-based cameras.

Speaker Bio: Davide Scaramuzza (1980, Italian) is Assistant Professor of Robotics at the University of Zurich and Adjunct Faculty at ETH Zurich. He is founder and director of the Robotics and Perception Group (http://rpg.ifi.uzh.ch), where he does research on low-latency vision and visually-guided micro aerial vehicles. He received his PhD (2008) in Robotics and Computer Vision at ETH Zurich (with Roland Siegwart).
He was Postdoc at both ETH Zurich and the University of Pennsylvania (with Vijay Kumar and Kostas Daniilidis). From 2009 to 2012, he led the European project “sFly”, which introduced the world’s first autonomous navigation of micro quadrotors in GPS-denied environments using vision as the main sensor modality. For his research contributions, he was awarded the IEEE Robotics and Automation Early Career Award (2014), a Google Research Award (2014), the European Young Researcher Award (2012), and the Robotdalen Scientific Award (2009). He is coauthor of the 2nd edition of the book “Introduction to Autonomous Mobile Robots” (MIT Press). He is author of the first open-source Omnidirectional Camera Calibration Toolbox for MATLAB, which, besides accomplishing thousands of downloads worldwide, is also used at NASA, Philips, Bosch, and Daimler. He is also author of the 1-point RANSAC algorithm, an effective and computationally efficient reduction of the standard 5-point RANSAC for visual odometry, when vehicle motion is non-holonomic. Finally, he is author of several top-ranked robotics and computer vision journals. His research interests are field and service robotics, intelligent vehicles, and computer vision. Specifically, he investigates the use of cameras as the main sensors for robot navigation, mapping, exploration, reasoning, and interpretation. His interests encompass both ground and flying vehicles.



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