

## SenSIP Student Seminar Series

### Visual-SLAM for Reconnaissance and Reconstruction: Large-Scale Multi-Agent 3D-Mapping

Presenter: David Ramirez

PhD Student

March 26, 2021, 3:00 PM / Zoom: <https://asu.zoom.us/j/86457128986>

#### Abstract

Simultaneous localization and mapping (SLAM) has been applied successfully to robotics when a terrain map and agent position must be estimated concurrently. Visual-SLAM focuses on situations when only a video perspective is available, whereas Visual-Inertial-SLAM also leverages sensor measurements subject to noise. As an academic challenge, SLAM does not allow GPS position measurements for localization, nor environment priors for mapping. For many geospatial surveying applications, GPS measurements and existing terrain maps can be leveraged. As the mapping scale grows larger, the measurement noise of GPS and map-priors is less significant. For security and surveillance applications, fusing video data from many real-time sources is critical. Very seldom has the SLAM problem been studied under these real-world conditions. We are investigating techniques for large-scale multi-agent Visual-SLAM, where mapping is the primary focus. This presentation will give a brief overview of the problem and a survey of the current state of the art.

#### Biography:



David Ramirez is a Ph.D. student in computer engineering at Arizona State University (ASU) and a Machine Learning Engineer at General Dynamics Mission Systems (GDMS). He received his Masters and Bachelors degrees both in electrical engineering from ASU, focusing in digital signal processing. He has worked at GDMS since 2017 and is a senior engineer in the Deep Learning Analytics Center of Excellence. He served in the United States Marine Corps and supported peaceful military operations in 11 countries. His research interests focus on detection and surveillance for geospatial intelligence, military training, and augmented-reality.

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