

Abstract: Camera-based 3D reconstruction and visual SLAM have witnessed significant progress over the last couple of years. I will introduce some recent realtime visual odometry methods including LSD SLAM and Direct Sparse Odometry. I will discuss how these methods can be made more robust and precise by fusing with additional sensory information – from additional cameras, from inertial or GNSS sensory systems. And I will discuss the challenge of robust relocalization in a previously generated map despite varying weather and illumination.