

## Riemannian Consensus and Camera Sensor Networks

**Roberto Tron (Johns Hopkins University)**

December 9, 2011

Consensus algorithms are a popular choice for computing averages and other aggregate functions in ad-hoc wireless sensor networks. However, existing work mostly addresses the case where the measurements lie in a Euclidean space. In the first part of the talk we will present Riemannian consensus, a natural extension of consensus algorithms to Riemannian manifolds. We will discuss its convergence properties and their dependence on various factors, such as network connectivity, geometric configuration of the measurements and curvature of the manifold. In the second part of the talk we will focus on the problem of distributed 3-D camera network localization, and show how ideas and analysis techniques from Riemannian consensus can be extended and applied to this problem.

### Bio

Roberto Tron received his BSc degree in 2004 and MSc degree (highest honors) in 2007 in Telecommunication Engineering from the Politecnico di Torino in Italy. He also received a Diplome d'Ingénieur from the Eurecom Institute and a DEA degree from the Université de Nice Sophia-Antipolis in 2006. He is currently a PhD student in the Department of Electrical and Computer Engineering at the Johns Hopkins University. He received the "General chair's Interactive Presentation Recognition Award" and the "Best Student Paper Runner-up Award" from the IEEE Conference on Decision and Control in 2009 and 2011, respectively. His research interests include motion segmentation and distributed algorithms on camera sensor networks.