



**Mon, Dec. 8**

**Porter Hall  
Room B34 at  
12:00 p.m.**



**Sunav Choudhary**  
*University of Southern  
California*

**Active Target Detection over Separable  
Fields: A Randomized Multi-way Trade-  
off**

**Sunav Choudhary** received the B.Tech. degree in electronics and electrical communication from the Indian Institute of Technology, Kharagpur, India, in 2010. He is currently a PhD. candidate in the Communication Sciences Institute of the University of Southern California, Los Angeles and is a recipient of the Annenberg Graduate Fellowship. His present research interests are in the field of sparse bilinear inverse problems and resource constrained structured sampling for low-rank matrix recovery and compressed sensing.

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**Active Target Detection over Separable Fields: A Randomized Multi-way Trade-off**

Target detection from samples of a field, is a generic problem of interest in a wide variety of applications including environmental monitoring, cyber-security, medical diagnosis, epidemic detection and military surveillance. In this talk, I shall consider the problem of target detection and localization from highly incomplete and noisy samples of decaying separable target fields, with samples collected by an autonomous vehicle. The novelty of this work is the use of separability/bilinearity to achieve a multi-dimensional trade-off in sample complexity, navigational complexity and detection/localization error, subject to computational tractability. In particular, the assumptions on the field are fairly generic and are applicable to many decay profiles and our approach does not need exact knowledge of the decay profile. A possibility of reduced sample complexity of target detection is highly beneficial for applications where speed of acquisition or processing is a bottleneck, like magnetic resonance imaging, underwater sonar imaging and streaming video processing. Our results make use of tools from concentration of measure in high-dimensional geometry and optimization theory with emphasis on low-rank matrix recovery.

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