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THE DEPARTMENT OF MATHEMATICAL SCIENCES PROUDLY PRESENTS

COLLOQUIUM

Computer vision for wearable video sensors: from stochastic filtering theory to applications in activity monitoring

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UPR-Mayagüez
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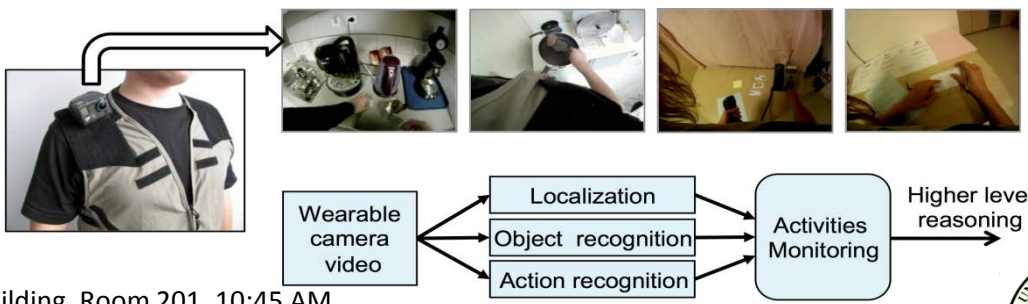
Abstract

In this talk, I will provide an overview of my recent research activities in the context of Computer Vision. In a first part, I will tackle the problem of parameter estimation in presence of noise, with application in the tracking of the 3D trajectory and orientation of a camera with uncertainty. Our recent theoretical work has proposed new solutions for Bayesian filtering, under the form of a generic Extended Kalman Filter on Lie Groups, where both state and observations belong to a matrix Lie Group manifold. This has general applicability to representations of rigid motion, similarity, semi-definite positive matrix, homography, etc. In a second part, I will demonstrate how this can be used in the context wearable video analysis. I will also discuss other tools developed for this application within the projects IMMED and Dem@Care, such as location and object recognition and how these methods can be integrated to help in the monitoring of activities from wearable sensors.

Keywords: Egocentric vision, activity monitoring, object recognition, 3d reconstruction, stochastic filtering, Extended Kalman Filter, Lie Groups.



Monzón Building, Room 201, 10:45 AM
Refreshments will be served
15 minutes before the colloquium, M213