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FACULTY OF
MANAGEMENT
DATA SCIENCE AND
ANALYTICS
DEPARTMENT

DEPARTMENTAL
SEMINARS

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ISB 210



Dr. Süha TUNA

Efficient Feature Extraction in Hyperspectral Imaging via ADMM-Optimized Enhanced Multivariate Products Representation

SHORT BIO: Dr. Süha Tuna is a faculty member in the Computational Science and Engineering Department at the ITU Informatics Institute. He previously worked as a research assistant in the same department and served as a postdoctoral researcher at the Hyperspectral Imaging Centre of the University of Strathclyde in Glasgow, United Kingdom. His research focuses on scientific computing, high-dimensional data analysis, tensor decomposition, optimization, and machine learning, with particular emphasis on the theoretical and computational aspects of these methods in hyperspectral imaging and bioinformatics applications.

ABSTRACT: This seminar addresses the challenges posed by the growing complexity and dimensionality of Hyperspectral Imaging data, emphasizing the need to preserve essential data characteristics while maintaining computational efficiency. It introduces an Enhanced Multivariate Products Representation that iteratively optimizes support vectors using the Alternating Direction Method of Multipliers, exploiting its decorrelation capabilities. The proposed framework functions as an effective feature extraction technique, transforming high-dimensional data while retaining intrinsic structural information. Experimental analyses on hyperspectral datasets indicate that the method strengthens data representations for subsequent classification tasks by reducing noise and artefacts without compromising salient features. Results further suggest that the approach adapts well to varying dataset scales, enhancing its suitability for diverse hyperspectral applications.