

Special Session on
Linear Algebra Tools for Artificial Intelligence
in conjunction with
23rd International Conference on Intelligent Systems Design and Applications
December 11-13, 2023
Website: <http://www.mirlabs.org/isda23>
Hybrid Mode – Online & Offline
Onsite Venues: <http://mirlabs.org/isda23/venue2.php>

Objectives and Scope

Linear algebra (LA) plays a fundamental role in the development of algorithms for tasks including machine learning, pattern recognition, etc. It fuels Artificial Intelligence (AI) by providing essential concepts and mathematical tools for representing, manipulating, transforming, optimizing, and learning data. Thus, the study of matrices is a huge part of LA. Matrix algebra plays a main role in several AI fields, such as support vector machines (SVMs), machine learning, evolutionary computation, and neural networks.

The aim of the Special Session “Linear Algebra Tools for Artificial Intelligence” is to bring together academicians, researchers, and industry professionals to present new techniques, recent approaches, applications, and theoretical/practical insights from a wide array of problems. Furthermore, this special session highlights high-quality original papers on related topics to LA for large-scale and real-time applications:

- Linear transformations: image recognition (identification patterns and objects within images), signal processing (denoising and filtering), and data analysis.
- Dimensionality reduction: Principal Component Analysis (PCA) and Singular Value Decomposition (SVD).
- Optimization and linear systems: solving optimization problems, solving systems of linear equations, least squares regression, and stochastic gradient descent.
- Eigenvalues and eigenvectors: dimensionality reduction, feature extraction, clustering algorithms, computer vision, natural language processing, and anomaly detection.
- Matrix multiplication, matrix transformation: neural networks, image classification, natural language processing, speech recognition, etc.

Subtopics

The topics include, but are not limited to:

- Linear Algebra in Robotics.

- Linear Algebra for Cryptography.
- Matrix Methods for Data Analytics.
- Linear Algebra in Computer Vision.
- Linear Algebra for Neural Networks.
- Linear Algebra in Image Processing.
- Linear Algebra Tools for Data Mining.
- Matrix Methods for Signal Processing.
- Linear Algebra in Electrical Engineering.
- Linear Algebra Applications to Network Flow.
- Linear Algebra for Natural Language Processing.
- Linear Algebra for Machine Learning and Data Science.
- Applied Linear Algebra for Business, Economics, and Finance.
- ...

Paper publications

- Proceedings will be published in Lecture Notes in Networks and Systems, Springer (<https://www.springer.com/series/15179>)
- Indexed by SCOPUS, INSPEC, WTI Frankfurt eG, zbMATH, SCImago
- Paper maximum length is 10 pages
- Papers must be formatted according to Springer format (Latex/word) available at: <https://www.springer.com/de/authors-editors/book-authors-editors/manuscript-preparation/5636#c3324>
- Submission Link: <https://cmt3.research.microsoft.com/ISDA2023>

Important Dates

Paper submission due: **September 30, 2023**

Notification of paper acceptance: **October 31, 2023**

Registration and Final manuscript due: **November 10, 2023**

Conference Date: **December 13-15, 2023**

Special Session Chair(s)

- **Sirine Marrakchi**, Department of Computer Science and Communications, Faculty of Sciences of Sfax (FSS), University of Sfax, Tunisia.

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