



TAIMA 2026

SPECIAL SESSION CALL FOR PAPERS

Geometry-Aware Learning and Modeling: Invariance, Stability, and Applications

Recent advances in learning algorithms and geometric modeling have enabled remarkable progress in image, shape, and signal analysis. However, many standard approaches whether neural or classical lack intrinsic robustness to geometric transformations such as rotations, translations, scaling, or non-rigid deformations. Ensuring invariance, stability, and interpretability remains a central challenge across disciplines from computer vision to medical imaging and 3D modeling.

This session focuses on the development and analysis of geometry-aware methods that leverage invariance, equivariance, and symmetry principles to improve learning, modeling, and representation of structured data in both classical and deep learning frameworks.

TOPICS OF INTEREST

- **Invariance & Equivariance in Modeling:** Classical and deep equivariant architectures ($SE(2)$, $SE(3)$, $SO(3)$, affine), group-based methods, geometric signal processing, shape morphing, and symmetry-aware modeling for 2D/3D shapes, surfaces, graphs, point clouds, and images.
- **Representations & Descriptors:** Analytic and learned invariant descriptors, moment-based, Fourier, contour, spectral representations, and hybrid approaches combining classical modeling with learning.
- **Learning Strategies & Data Augmentation:** Generative AI, Geometric augmentation (rigid and non-rigid), enforcing equivariance and invariance through architecture, and improving robustness and generalization under transformations.
- **Stability, Robustness & Theory:** Stability analysis, Lipschitz continuity, invertible or interpretable feature mappings, and the use of geometric priors in modeling and learning.
- **Applications:** Computer vision and 2D/3D image understanding, medical and biomedical imaging, robotics and autonomous systems, industrial inspection, shape analysis, biometrics, 3D DUKing, cultural heritage, sustainable monitoring, and remote sensing.

SUBMISSION TYPE

Submissions must be written in **English**, include both **classical** and **deep learning** approaches, and will be **peer-reviewed by an international committee**. The maximum length is **6 pages**.

IMPORTANT DATES

Sub. opening: **15 Feb. 2026**
Sub. deadline: **15 Mar. 2026**
Accept. notif.: **30 Mar. 2026**
Final version sub.: **18 Apr. 2026**

CHAIRS

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