



SPECIAL SESSION

Advances in Hyperdimensional Computing and Vector Symbolic Architectures

ORGANIZERS

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This Special Session is to support the exploration of Hyperdimensional Computing and Vector Symbolic Architectures (HD/VSA) and to identify their contribution to the next generation of intelligent systems. HD/VSA form high-dimensional distributed representations that allow efficient learning, symbolic manipulation, and robust performance in presence of noise, which makes them appealing for applications operating under tight resource, interpretability, or latency constraints.

The session welcomes contributions that present theoretical developments, empirical findings, or non-trivial applications of HD/VSA, including studies that examine how HD/VSA models can be combined with neural networks and other approaches to learning systems. The session aims to bring together researchers interested in understanding how HD/VSA can contribute to more interpretable, parsimonious, and reliable intelligent systems.

This initiative is closely linked to the recently approved [IEEE Task Force on Hyperdimensional Computing](#), which supports community-building efforts such as workshops, and special sessions at leading conferences including events organized by IEEE CIS. The Task Force serves as a hub for researchers aiming to develop methodologies and advance the state of the art in this evolving area.

Topics of Interest

- HD/VSA algorithms for perception, sequence processing, graph structures, and multimodal data
- Transformations for mapping structured data (e.g., time series, images, graphs) into high-dimensional distributed representations
- Integration of HD/VSA primitives such as binding, memory, and compositional reasoning within neural architectures
- Symbolic composition and other HD/VSA-based solutions for interpretable and explainable systems
- Comparative studies on efficiency, energy consumption, memory usage, and computational trade-offs in HD/VSA versus other machine learning approaches
- Deployment of HD/VSA algorithms on computing hardware, including microcontrollers, neuromorphic devices, and quantum-inspired systems
- HD/VSA algorithms for handling uncertainty, fuzzy reasoning, and evolutionary design
- Benchmarks, datasets, and open resources to support accessible, interoperable, and reusable research on HD/VSA

MORE INFO: www.hd-computing.com/events

Important dates

31.01.2026

Paper submission deadline
(23.59, Anywhere on Earth,
i.e. UTC-12)

15.03.2026

Paper acceptance notification

15.04.2026

Camera ready papers due

01.05.2026

Early registration deadline

21-26.06.2026

Congress