EXTENDED DEADLINE- 27 July 2026

IEEE JOURNAL ON EMERGING AND SELECTED TOPICS IN CIRCUITS AND SYSTEMS

Call for PAPERS

When Large Models Meet Video Coding: Synergies, Systems, and Hardware Challenges

Guest editors

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Rationale, motivation, and scope

Large Models (LMs), including LLMs and multimodal LLMs (MLLMs), have revolutionized artificial intelligence, opening new frontiers in video compression, synthesis, and enhancement. While algorithmic advances are significant, their real-world impact hinges on efficient, scalable, and secure hardware and system implementations. The exponential growth of model size and video data demands novel hardware solutions, real-time processing, and low-power designs for edge and mobile applications.

This special issue focuses on the circuits, architectures, and systems that enable LM-driven video coding—addressing challenges in energy efficiency, memory bandwidth, real-time processing, hardware-aware optimization, and system-level robustness. It aims to provide a forum for pioneering research at the intersection of large models, video compression, and circuits and systems, uniquely centered on hardware, co-design, and system integration rather than purely algorithmic advances.

Topics of interest

Topics of interest to this special issue include, but are not limited to:

- **Hardware/System Architectures:** ASIC/FPGA/GPU and accelerator designs for neural and generative video codecs; in-memory computing; near-sensor processing; System-on-Chip (SoC) integration.

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- **Hardware-Aware Optimization & Co-Design:** Quantization, pruning, and tokenization for hardware-friendly LMs; complexity-accuracy trade-offs; latency and throughput optimization for edge/cloud deployments.
- **Memory, Bandwidth & Energy Efficiency:** Memory hierarchy optimization; bandwidth reduction techniques; energy-efficient coding for battery-constrained devices; green computing strategies.
- **System-Level Security, Reliability & Deployment:** Hardware security for AI-based video systems (e.g., adversarial resilience); fault-tolerant architectures; robustness against compression artifacts and deepfakes.
- **Large Models for Video Coding & Processing:** Neural video compression; generative and diffusion models for low-bitrate streaming; dynamic bitrate adaptation.
- **Video Coding Techniques for Improving LMs:** Efficient video compression to accelerate LM training/inference; latent-space video representations; new tokenization methods.
- **Emerging Applications:** LM-powered coding for VR/AR, automotive, medical, and UAV systems; standardization-ready hardware implementations.

Submission procedure

Prospective authors are invited to submit their papers following the instructions provided on the IEEE JETCAS website: https://ieee-cas.org/publication/JETCAS/manuscript-submission-guide. The submitted manuscripts should not have been previously published, nor should they be currently under consideration for publication elsewhere. The IEEE JETCAS submission site is https://ieee.atyponrex.com/journal/jetcas.

Important dates

• Manuscript submissions due:	~~June 1, 2026~~	July 27, 2026
• First round of reviews completed:	~~July 20, 2026~~	August 31, 2026
• Revised manuscripts due:	~~August 31, 2026~~	September 30, 2026
• Second round of reviews completed:	~~September 28, 2026~~	October 31, 2026
• Final manuscripts due:	~~October 19, 2026~~	November 30, 2026

Request for information

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