electronics

MDPI

Journal: Electronics
Special Issue: Motion-centric Video Processing
Deadline: 15 December 2024

Guest editors:
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Summary:

Video captures various motions, including natural dynamics and human movements. Numerous research efforts have been devoted to learning and extracting spatio-temporal features for diverse video processing tasks, including scene understanding, human action recognition, anomaly detection, and more. Nowadays, video data undergo preprocessing to become lightweight and informative enough using machine learning and computer vision algorithms, largely reducing the redundant nature of video frames. Techniques like optical flows highlight dynamics, depth videos segment foreground objects or human subjects, and skeleton sequences focus on human body joints evolving in time, enhancing video comprehension. These methods render video representations more lightweight and cleaner, characterized by efficient motion extraction, storage efficiency, and faster processing speed.

The advent of large video foundation models has improved numerous downstream processing tasks, such as scene understanding, video captioning, and video summarization. The emergence of Large Language Models (LLMs) has introduced a fresh perspective to video processing. Leveraging video captions, prompts, and similar techniques has significantly enhanced performance across various domains like anomaly detection and action recognition. However, the lightweight and informative motion data extracted from videos have not been widely used by LLMs, and the data being fed into these video foundation models are still the raw video frames, which are indeed less efficient due to the redundant nature of frame data. In addition, video processing confronts challenges, including the substantial efforts and time required for large-scale pretraining, privacy concerns, and others.

Hence, there is a pressing need for new, efficient, and lightweight techniques to tackle the challenges inherent in motion-centric video processing. These techniques will facilitate the efficient operation of video-based recognition, detection, and understanding systems in real-world scenarios.

Dear Colleagues,

I am excited to introduce the scope and purpose of our upcoming MDPI open-access journal Electronics (IF: 2.9) special issue, which aims to address the challenges and advancements in motion-centric video processing. This issue will focus on the development and implementation of efficient and lightweight techniques to enhance video-based recognition, detection, and understanding systems in practical scenarios.

The primary focus of this special issue is to explore innovative approaches that can handle the complexities of motion-centric video processing. We aim to cover a broad scope of topics, including but not limited to:

Focus: Investigating novel methods for motion extraction, spatio-temporal feature learning, and video representation to improve the efficiency and effectiveness of video processing systems.

Scope: Addressing challenges such as scene understanding, human action recognition, anomaly detection, and other relevant applications within the realm of video processing.

Purpose: Providing a platform for researchers to present their latest findings, methodologies, and insights into motion-centric video processing. The goal is to foster the development of practical solutions that can be applied in real-world scenarios.

This special issue will complement existing literature by offering fresh perspectives and innovative techniques in the field of video processing. By highlighting the importance of motion-centric approaches, we aim to bridge the gap between theoretical research and practical applications. Our contributions will build upon the foundation laid by previous studies, offering new insights and solutions to address the evolving challenges in this domain.

We invite submissions presenting new and original research on topics including but not limited to the following:

1. Motion-centric video processing
2. Efficient video representation
3. Scene understanding
4. Human action recognition
5. Anomaly detection
6. Lightweight techniques (e.g., architectures, models, machine learning algorithms, etc.)
7. LLMs on videos (e.g., foundation models, etc.)
8. Practical applications (e.g., vision, language, audio, etc.)

Additional details regarding submissions and deadlines will be announced shortly.

Kind regards,
Guest editors