CAIT2026 Special Session V

Special Session Basic Information:

Session Title	中文：图像编辑及其应用 英文：Image Editing and Its Applications

Introduction and topics

中文：

图像编辑是一个跨学科的科学领域，研究如何利用计算机视觉、图像处理、计算机图形学和人工智能技术来修改、增强、恢复、生成和操纵数字图像。从工程角度来看，它旨在实现图像修改任务的自动化，同时提高编辑效率、视觉质量、语义一致性和可控性。

图像编辑涵盖图像处理、分析、理解、生成和修改等方法。典型任务包括图像增强、恢复、修复、上色、超分辨率重建、风格迁移、物体移除或插入、背景替换、图像合成以及文本引导的编辑。在这一背景下，图像理解是指将视觉内容转化为语义表示，以便根据特定指令或应用需求进行修改。

作为一门科学学科，图像编辑涉及基于几何学、物理学、统计学、计算机图形学和机器学习等方面的理论与模型。图像数据可能包括自然图像、视频序列、医学图像、遥感图像、深度图像、红外图像以及多模态视觉数据。

作为一门技术学科，它致力于开发智能、高效、可控、可靠的图像编辑系统。图像编辑的子领域包括：图像增强、图像恢复、图像修复、图像超分辨率重建、图像上色、风格迁移、物体与背景操作、语义图像编辑、多模态图像生成、三维图像编辑、视频编辑以及合成图像检测。

英文：

Image editing is an interdisciplinary scientific field that studies how to modify, enhance, restore, generate, and manipulate digital images using computer vision, image processing, computer graphics, and artificial intelligence technologies. From an engineering perspective, it aims to automate image modification tasks while improving editing efficiency, visual quality, semantic consistency, and controllability. Image editing encompasses methods for processing, analyzing, understanding, generating, and modifying digital images. Typical tasks include image enhancement, restoration, inpainting, colorization, super-resolution, style transfer, object removal or insertion, background replacement, image composition, and text-guided editing. In this context, image understanding means transforming visual content into semantic representations that can be modified according to specific instructions or application requirements. As a scientific discipline, image editing involves theories and models based on geometry, physics, statistics, computer graphics, and machine learning. Image data may include natural images, video sequences, medical images, remote sensing images, depth images, infrared images, and multimodal visual data. As a technical discipline, it seeks to develop intelligent, efficient, controllable, and reliable image editing systems. Subfields of image editing include image enhancement, image restoration, image inpainting, image super-resolution, image colorization, style transfer, object and background manipulation, semantic image editing, multimodal image generation, three-dimensional image editing, video editing, and synthetic image detection.

Call for Papers:

This symposium seeks high-quality technical articles from both industry and academia to address current research challenges and provide innovative solutions for image enhancement, image restoration, image inpainting, image colorization, image super-resolution, style transfer, object removal and insertion, background replacement, image composition, semantic image manipulation, text-guided image editing, multimodal image generation, three-dimensional image editing, video editing, and synthetic image detection, etc.

Topics:

Innovative methods and applications of image editing technology
Image enhancement, restoration, and super-resolution
Image inpainting and missing-content completion
Object removal, insertion, replacement, and background editing

Semantic, interactive, and controllable image editing
Text-guided and multimodal image editing
Deep learning, generative adversarial networks, and diffusion models for image editing
Style transfer, image colorization, and artistic image generation
Medical, remote sensing, and video image editing applications
Image quality assessment, synthetic image detection, security, and ethics

Special Session Chair(s):

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Organizer's Brief Biography

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Bingshu Wang received his Ph.D. degree in Computer Science from University of Macau, Macau, China, in 2020. He received the M.S. degree in electronic science and technology (Integrated circuit system) from Peking University, Beijing, China, in 2016, and B.S. degree in computer science and technology from Guizhou University, Guiyang, China, in 2013. Now he is an associate professor in School of Software, Northwestern Polytechnical University. He is also an member of Chinese Association of Automation (CAA), China Computer Federation (CCF), Chinese Association for Artificial Intelligence(CAAI). His current research interests include computer vision, intelligent video analysis, machine learning, and Artificial Intelligence Education.

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Han Zhang received her Ph.D. degree in Computer Science and Technology from Northwestern Polytechnical University. She is now an associated professor with School of Artificial Intelligence, OPtics and ElectroNics (iOPEN), Northwestern Polytechnical University, Xi'an 710072. Her current research is multi-modal cognitive computing, cross-domain remote sensing, Vicinagearth Security (VS)