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EI² 2023 Special Session 09

Applications and Challenges of Computer Vision in Smart Grid and Energy Systems

Introduction and topics

In the era of digital transformation, Computer Vision (CV) has emerged as a powerful tool, not only in traditional sectors like robotics and healthcare but also in the realms of Smart Grid and Energy Systems. This fusion of CV with energy systems holds the promise of reshaping the way we generate, distribute, and consume energy, while also addressing some of the sector's most pressing challenges.

Key Topics to Explore:

\\ **Basics and Evolution of Computer Vision in Energy Systems:** A glimpse into how computer vision techniques have evolved and how they're being integrated into modern energy infrastructures.

\\ **Grid Equipment Monitoring:** Leveraging CV to detect equipment malfunctions and wear-and-tear in real-time, thereby preventing potential outages and ensuring consistent energy supply.

\\ **Safety Surveillance:** Harnessing CV capabilities to identify safety hazards within grid infrastructures, reducing risks and improving overall grid safety protocols.

\\ **Drones and Computer Vision in Grid Inspection:** Combining unmanned aerial vehicles (UAVs) with computer vision for efficient, accurate, and timely inspections of vast grid networks, especially in challenging terrains.

\\ **CV meets IoT in Energy Systems:** Discussing the symbiotic relationship between CV and the Internet of Things (IoT) in gathering comprehensive, real-time data for energy systems.

\\ **Challenges in Implementing Computer Vision:** Delving into the technical and practical challenges of using computer vision in energy contexts, from data storage issues to real-time processing demands.

\\ **Future Outlook:** Speculating on the trajectory of computer vision in the smart grid and energy sectors, focusing on upcoming technologies and potential breakthroughs.

As the grid becomes smarter and more interconnected, the need for robust monitoring, safety, and efficiency mechanisms cannot be overstated. Computer Vision, with its ability to process and analyze vast amounts of visual data at unprecedented speeds, stands at the forefront of meeting these needs. This exploration seeks to provide a comprehensive understanding of the current applications, inherent challenges, and future potential of CV in the continually evolving landscape of Smart Grid and Energy Systems.

Special Session Chairs

Yunfeng Yan
Zhejiang University

Donglian Qi
Zhejiang University

Shixiang Tang
The Chinese University of Hong Kong

Publication

The conference papers will be published by the IEEEXplore website and indexed by EI, and high-quality papers will be recommended to Energy Conversion and Economics, Energy Internet, Journal of Modern Power Systems and Clean Energy (MPCE), CSEE Journal of Power and Energy Systems (CSEE JPES), Applied Energy, and others.

Website

Submission Link: https://easychair.org/conferences/?conf=ei22023

Full Paper Submission Deadline: Oct. 31st, 2023

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Conference Secretary: Ms. Joyce Zhong
Email: ei2@youngac.cn
Telephone: +86 18628263876