Uav mobile energy storage

Hydrogen fuel cells and the economics of unmanned aerial vehicles (UAVs) are gaining global attention. With higher energy densities, fuel cells can overcome the range ...

Mobile Edge Computing (MEC) has become a critical paradigm. It extends traditional cloud com- puting capabilities by moving computation and storage closer to the network edge. A significant challenge in MEC is the inefficiency and high energy consumption in data offloading for mobile edge computing (MEC) systems due to traditional offloading techniques. ...

In the propulsion systems of electric aircraft, the energy density, defined in watt-hours per kilogram, has a direct impact on determining the range and payload capacity of the aircraft (Gray et al., 2021).While conventional Li-ion batteries can provide an energy density of about 150-200 Wh/kg (Dubal et al., 2019), a fuel cell system provides higher specific energy ...

Application of photovoltaic (PV) generation system in moving carriers, such as UAVs is receiving considerable attention. In this case, a UAV outfitted by PV arrays on its ...

This paper presents a hybrid energy storage system which is composed of PV panel, rechargeable fuel cell and rechargeable battery to solve the energy issues of long endurance ...

AbstractIn the ultra-reliable, low-latency next-generation mobile network (beyond 5G or 6G), a resource-constrained unmanned aerial vehicle (UAV) user needs continuous energy-providing and mobile edge computing (MEC) facilities. In this study, we deploy ...

In this article, an energy constrained unmanned aerial vehicle (UAV)-aided mobile edge-cloud continuum framework is introduced, where the offloaded tasks from ground IoT devices can be ...

Recently, adopting UAVs equipped with the edge computing platform to provide computing service has been considered as a promising approach for resource-limited devices in mobile edge computing (MEC). Unfortunately, the limited resources (e.g., energy, computing and communication) of the UAV may significantly restrict its service capability, which means it has ...

1. Introduction. In recent years, 5G communication technology and the Internet of Things (IoTs) have developed rapidly. Mobile edge computing (MEC) attracts much attention, which can ...

In this paper, hydrogen coupled with fuel cells and lithium-ion batteries are considered as alternative energy storage methods. Their application on a stationary system (i.e., energy storage for a family house) and a mobile system (i.e., an unmanned aerial vehicle) will be investigated. The stationary systems, designed for off-grid applications, were sized for ...

A novel joint optimization algorithm consisting of offloading, resource allocation, and UAV trajectory schedule was presented in Ref. (Zheng et al., 2019), wherein the authors used a constraint-based method to demonstrate how the total consumption of energy in UAVs and smart mobile devices can be minimized in a MEC system in which a UAV hovers ...

Some scholars have done relevant research on UAV-assisted MEC systems. Ref. [6] proposed a quantitative dynamic programming algorithm to solve the problem of MEC resource allocation. In Ref. [7], the trajectory of the UAV is discretized, and the continuous space is transformed into a discrete finite space, which makes the problem easy to deal with Ref. [8], ...

In this paper, we propose a mobile edge computing (MEC)-enabled unmanned aerial vehicle (UAV)-assisted vehicular ad hoc network (VANET) architecture, based on which a number of vehicles are served by UAVs equipped with computation resource. Each vehicle has to offload its computing tasks to the proper MEC server on the UAV due to the limited ...

Despite their performances and technological advancements, fuel cells have some limitations when used as a unique power source for UAVs. Indeed, a fuel cell is characterized by a large time-constant (in the order of seconds) since it needs to be supplied by fuel and air using pumps, valves, and compressors.

Fuel cells have emerged as a promising alternative due to their higher specific energy. Furthermore, numerous existing UAVs employ a hybrid configuration in their power supply, utilizing multiple energy sources such as batteries, fuel cells, solar cells, and supercapacitors.

Each of the criteria affect different aspects of the drone, power density affects the acceleration capabilities, energy density determines the range, cycle life determines how often ...

To ensure the reliability and operational efficiency of the grid system, this paper proposes an unmanned aerial vehicle (UAV)-assisted Power Internet of Things (PIoT), which obtains real-time grid data through PIoT devices to support the management optimization of the grid system. Compared with traditional UAV-assisted communication networks, this paper ...

However, the limited computing capability and energy storage of UAV terminals cannot provide intensive computing and complete high-energy tasks. Currently, mobile edge computing (MEC) has become an important solution to solve mentioned issues and to enhance transmission delay and transmission energy consumption.

Energy storage constraints limit the range and endurance of electric based unmanned aerial vehicles (UAVs). Solving the energy storage problem allows the adoption of UAVs on a much wider scale. A solution to the problem would ideally retain the significant performance and efficiency benefits of the electric based propulsion system. The contents of ...

Unmanned aerial vehicles (UAV) have been widely used in various fields because of their high mobility and portability. At the same time, due to the rapid development of artificial intelligence, people"s demand for computing is increasing, and the computing power of existing mobile computing devices cannot fully meet the users" needs for network quality. Therefore, ...

The recent advancements of mobile edge computing (MEC) technologies and unmanned aerial vehicles (UAVs) have provided resilient and flexible computation services for ground users beyond the coverage of terrestrial service. In this paper, we focus on a UAV-assisted MEC system in which the UAV equipped with MEC servers is used to assist user ...

Demonstrating its liquid on-board and its zero-loss mobile hydrogen technology, GenH2, a leader in hydrogen infrastructure solutions, will fuel an unmanned aerial vehicle (UAV) tomorrow - Friday, February 23 - at its Titusville headquarters. By utilizing liquid hydrogen, the UAV can travel four times farther than previous capabilities.

However, the limited computing capability and energy storage of UAV termi-nals cannot provide intensive computing and complete high-energy tasks. Cur-rently, mobile edge computing (MEC) has become an important solution to solve ... The proposed algorithm is to minimize the total energy consumed by mobile device while meet the users delay ...

Special Section: UAV-Enabled Mobile Edge Computing Guest Editorial: UAV-Enabled Mobile Edge Computing ISSN 1751-8628 E-First on 28th August 2020 doi: 10.1049/iet-com.2020.0678 ... energy of the UAV through the joint power optimisation. For signaling and quality of service provisioning, in the paper entitled ...

Edge computing facilitates low-latency services at the network"s edge by distributing computation, communication, and storage resources within the geographic proximity of mobile and Internet-of-Things devices. The recent advancement in Unmanned Aerial ...

As UAVs suffer from both storage and energy limitations, thus, lightweight and portable ML, DL, and RL approaches can be adopted to tackle these limitations. ... Shi Q, Zhao MJ (2020) Efficiency maximization for UAV-enabled mobile relaying systems with laser charging. IEEE Trans Wirel Commun 19(5):3257-3272 ... (2013) Unmanned aerial vehicle ...

This paper describes the design of an inflight power generation, management and storage system applicable to Unmanned Air Vehicles (UAV). Emerging UAV, drones and other aircraft can use ...

Current research on UAV-assisted MEC has a relatively diverse focus. Xu et al. proposed combining UAVs with long range wide area networking for MEC services under disaster management [4], which involves rules for offloading tasks to UAV nodes in disaster areas without network signal.The solution proposed by the authors enables low cost and long range MEC ...

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UAV stands for Unmanned Aerial Vehicle, which is commonly considered to be a drone or an aircraft with no pilot on board. UAVs can be remote-controlled aircraft [3].The unmanned aerial vehicle contains cameras, sensors, communication belonging as well as other payload devices [4] was created for military usage, and civilian usage to protect the border.

UAV-provided Mobile Services Xuehe Wang and Lingjie Duan Abstract--Due to its agility and mobility, the unmanned aerial vehicle (UAV) is a promising technology to provide high-quality ... In Stage II, given an individual UAV"s energy storage B upon arrival at its deployed hotspot, this UAV should decide the energyallocationto hoveringtime T ...

Unmanned aerial vehicles (UAVs) are often used in mission-critical applications, requiring a critical criterion in flight time. Unfortunately, severe power fluctuations, caused by specific flight patterns, degrade the deliverable capacity of the battery and hamper the flight time. A common approach to mitigating power fluctuations is to employ a hybrid energy storage system using a ...