



# Communications and computing batteries

Lin Y Kuo C Tsai M Wang C (2023) Queueing Model for Intermittent Communication and Computing of Battery-Less Edge Computing 2023 IEEE International Conference on Communications Workshops (ICC Workshops) 10.1109/ICCWorkshops57953.2023.10283601 (139-144) Online publication date: 28 ...

Sensing, communication, and data computing are enabling technologies to support diverse smart city applications. A four-layer structure for smart city applications was summarised in Ref. [], as shown in Figure 2. The sensing layer collects massive data generated at the application layer of sensors and digital devices, which are then ...

computing and information communication over the same radio spectrum. In this paper, we provide a unified framework integrating sensing, computing, and communication to optimize limited system resource for 6G wireless networks. In particular, two typical joint beamforming design algorithms are derived based

This paper delves into the challenges and potentials of managing battery health and safety, highlighting the transformative impact of integrating physics and ...

Batteries have ever-present reaction interfaces that requires compromise among power, energy, lifetime, and safety.

The aim of this Special Issue is to collate innovative research on technical challenges and recent results related to BackCom-enabled battery-free communications. Researchers and practitioners working in this area are invited to discuss and express their views on the current trends, challenges, and state of the art solutions addressing various ...

Lithium-ion batteries are integral to modern technologies but the sustainability of long-term battery health is a significant and persistent challenge. In this perspective Borah and colleagues ...

However, the computing power and battery capacity of MT are usually limited, therefore it is necessary to offload the computation tasks to reduce the workload and improve the performance of the MT. ... And we will study the energy-efficient computation offloading problem with edge computing and D2D communications through machine ...

The partnership aims to create the most advanced battery chemistry model yet developed on quantum computers, measured by the number of qubits and quantum gates, the quantum computing version of ...

New low power communication technologies combined with new energy harvesting techniques can significantly improve the energy efficiency of IoT battery-less ...



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Flexible battery-free communication system. ... Mann, S. Wearable computing: A first step toward personal imaging. Computer 30, 25-31 (1997). Article Google Scholar

Publications. A New Paradigm of Communication-Aware Collaborative Positioning for FutureG Wireless Systems Yu-Tai Lin and Karthikeyan Sundaresan ACM International Symposium on Theory, Algorithmic ...

Most ad hoc mobile devices today operate on batteries. Hence, power consumption becomes an important issue. ... Maximum battery life routing to support ubiquitous mobile computing in wireless ad hoc networks. Author: C ... Energy Efficient Multi-hop Cooperative Transmission Protocol for Large Scale Mobile Ad hoc Networks ...

A four layer networked architecture of cloud-side-end collaboration for battery management system is presented which breaks through the computing capacity ...

The rapid growth of IoT driven by recent advancements in consumer electronics, 5G communication technologies, and cloud-computing-enabled big data analytics, has recently attracted tremendous attention from both the industry and academia. One of the major open challenges for IoT is the limited network lifetime due to massive ...

Mobile-edge computing (MEC) is an emerging paradigm to meet the ever-increasing computation demands from mobile applications. ... of computation experience, e.g., the execution latency, could be greatly improved. Nevertheless, as the on-device battery capacities are limited, computation would be interrupted when the battery ...

With the high demand for advanced services and the increase in the number of connected devices, current wireless communication systems are required to expand to meet the users' needs in terms of quality of service, throughput, latency, connectivity, and security. 5G, 6G, and Beyond (xG) aim at bringing new radical changes ...

Nature Communications - Devices with a wide-temperature range persistent photoconductivity (PPC) and low power consumption is a challenge for optical synaptic devices in neuromorphic computing ...

Batteries, an international, peer-reviewed Open Access journal. Journals. Active Journals Find a Journal Proceedings Series. Topics. Information. ... such as quantum computing, communication, sensing. As these technologies are underpinned by the quantum storage and transfer of energy, the applications of QB devices or principles to ...

During the last decade, and building on work from the decades prior, research pushed toward a new kind of system that is pervasively deployed, but also free from batteries. Like traditional ...



# Communications and computing batteries

but also free from batteries. Like traditional sensing systems, compute batteryless IoT devices feature sensing, computing, and communication modules, as shown in Figure ...

As discussed in the previous article, "closed-loop communication" is a buzzphrase that vaguely describes "communicating batteries." In this article, we will compare basic and advanced battery communication, discuss the challenge of "good" inverter-battery communication, and what happens when it's absent, incomplete, or ...

Most ad hoc mobile devices today operate on batteries. Hence, power consumption becomes an important issue. To maximize the lifetime of ad hoc mobile networks, the power consumption rate of each node must be evenly distributed, and the overall transmission power for each connection request must be minimized.

With the growing number of deployments of Internet of Things (IoT) infrastructure for a wide variety of applications, the battery maintenance has become a major limitation for the sustainability of such infrastructure. To overcome this problem, energy harvesting offers a viable alternative to autonomously power IoT devices, ...

In this paper, the online power control problem for energy harvesting wireless communication system with a finite storage capacity battery is addressed, where the channel state and energy harvesting rate are both unknown. A low complexity algorithm based online convex optimization is proposed to guarantee energy availability of energy ...

Proposing optimal designs of quantum batteries which are able to exploit quantum advantages requires balancing the competing demands for fast charging, ...

Comparison between quantum batteries and other conventional battery types Table 86. Types of quantum batteries Table 87. Applications of quantum batteries ... Quantum Technology Market by Computing, ...

Controlling electromagnetic waves and information simultaneously by information metasurfaces is of central importance in modern society. Intelligent metasurfaces are smart platforms to manipulate the wave-information-matter interactions without manual intervention by synergizing engineered ultrathin structures with active ...

Communication technologies are developing very rapidly and achieving many breakthrough results. ... online games, high-definition Internet TV, 3D TV, and cloud computing. The two technologies were standardized for 4G as Wimax ... ZigBee is typically used in extreme-low data rate networks, short-range, and long-lasting battery life such ...

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# **Communications and computing batteries**

A future with trillions of battery-powered devices suggests that trillions more batteries won't be recycled, which will result in an environmental catastrophe, the researchers write. Finding alternative and environmentally friendly energy sources could avert such a crisis and expand a device's lifetime and memory storage capacity.

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