SolarGrid Energy Solutions

Low-altitude communication base station energy management system planning

Overview

What is a low-altitude network base station planning model?

To address these challenges, we propose a novel low-altitude network base station planning model based on the Proximal Policy Optimization (PPO) algorithm. Our approach involves calculating the low-altitude coverage capabilities of different base station types using ray tracing techniques.

Why do we need communication base stations?

Communication base stations or other auxiliary facilities are needed to improve the accuracy of perception and positioning. For low-altitude navigation, high-frequency and high-density low-altitude activities require a more digital and refined aircraft navigation mode.

How can a low-altitude management platform support integrated sensing & communication (Isac)?

Through capability openness, sensory data can be shared with a low-altitude management platform. Ultimately, the communication, navigation, sensing (CNS) requirements of low-altitude applications can be met. ZTE’s Efforts in Verifying Integrated Sensing and Communication ZTE has been actively exploring and applying ISAC.

What is low-altitude airspace?

Introduction to Low-altitude Economy Low-altitude airspace typically refers to the airspace within 1,000 meters from the ground, and it may extend to 3,000 meters based on different regional characteristics and actual needs. Low-altitude airspace has gradually transformed from a natural resource into an economic resource.

What is a low altitude flight control system?

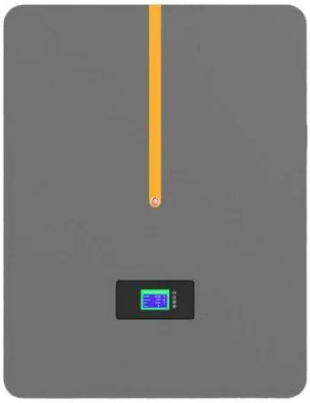
Low-Altitude Flight Control System: The system connects directly to aircraft and focuses on real-time control and command during flight. The core

functions of the system include monitoring flight status, issuing early warnings, and delivering dynamic adjustment commands to ensure safe operations.

How can a decision model be used for base station placement?

We construct a decision model for base station placement and utilize the PPO algorithm to determine optimal base station configurations. Through reinforcement learning training and simulation validation, we demonstrate that our model effectively generates base station deployment plans, achieving predefined signal coverage objectives.

Low-altitude communication base station energy management syste

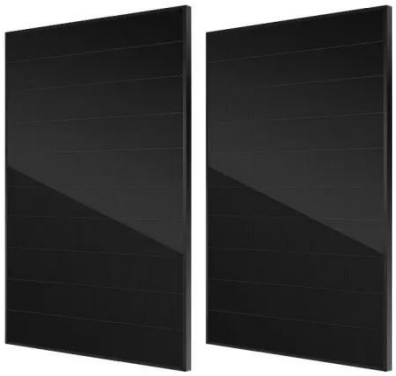


Hybrid AI-based 4D trajectory management system for dense low altitude

Oct 1, 2024 · Without suitable regulatory advancements and associated traffic management systems, air traffic in the densest low-altitude sectors may incur congestion, which, in addition ...

Toward Practical Low-Altitude Economy Networking: ...

Jun 15, 2025 · Interference management and integration among satellite, low-altitude, and terrestrial networks in LAE. Integrating communication, sensing, and computing for real-world ...



A flight risk field model for advanced low-altitude ...

Dec 1, 2024 · The operation of Advanced Low Altitude Traffic Systems (ALT) in urban low-altitude environments is intricate and susceptible to weather conditions. It is undeniable that the flight ...

Networked ISAC for Low-Altitude

Economy: Coordinated ...

Feb 12, 2025 · This paper exploits the networked integrated sensing and communications (ISAC) to support low-altitude economy (LAE), in which a set of networked ground base stations ...

Unmanned aerial vehicles: Applications, ...

Sep 19, 2022 · Next generation wireless networks are expected to be greatly supported by unmanned aerial vehicles, which can act as aerial base stations ...

Architecture analysis and design for low earth orbit satellite

Apr 24, 2025 · The deep collaboration between low earth orbit satellite (LEO) and low-altitude intelligent network (LAIN) in areas such as coverage, resource allocation, and network ...

LAERACE: Taking the policy fast-track towards low-altitude ...

Jun 1, 2025 · Section 4 examines the physical and digital infrastructure requirements, including vertiports, charging stations, and air traffic

management systems, that are essential for ...

Digital Low-Altitude Airspace Unmanned Aerial ...

Apr 22, 2025 · This paper proposes a digital low-altitude airspace unmanned aerial vehicle (UAV) path planning method tailored for urban risk environments ...

Unmanned aerial vehicles based low-altitude economy with ...

Mar 25, 2025 · The emerging low-altitude economy with Unmanned Aerial Vehicles (UAVs) can promote sustainability development goals (SDGs). Low-altitude traffic pertains to the airspace ...

Low-altitude base station and ground base station ...

The embodiments of the present disclosure provide a low-altitude base station and ground base station

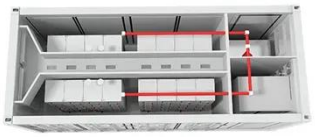
collaborative management method, an electronic apparatus, and a medium. The ...

LLM-Empowered Near-Field Communications for Low ...

Jun 24, 2025 · Abstract--The low-altitude economy (LAE) has recently re-ceived widespread attention from both academia and industry. To facilitate and support the successful ...

Toward Realization of Low-Altitude Economy Networks: Core ...

Apr 30, 2025 · To address these, this paper first explores related standards and core architecture that support the development of LAE networks. Subsequently, we highlight the integration of ...



(PDF) Overview and Suggestions on the ...

This paper studies and improves the theory of low-altitude flight service guarantee system construction, and

provides some support for China's low-altitude ...

Integrated Sensing and Communications for Low ...

Jan 3, 2025 · Abstract--This paper studies an integrated sensing and communications (ISAC) system for low-altitude economy (LAE), where a ground base station (GBS) provides ...

The exploration and practice of low-altitude airspace flight ...

This paper focuses on the main operational scenarios and characteristics of unmanned aviation development in China. New operational characteristics and associated challenges due to ...

UAV Swarm-enabled Collaborative Post-disaster ...

Jan 13, 2025 · tion, artificial intelligence, network communication, and unmanned trafic management systems to enable the eficient integration of applications

across various fields, ...

Networking and control mechanism for low-altitude ...

Low-Altitude Intelligent Network (LAIN), as a new type of intelligent network, relies on space-air-ground-sea facilities to constitute a digital intelligent network system. It is a key component ...

Cloud-Enabled High-Altitude Platform Systems: ...

Jul 16, 2021 · From the one side, the HAPS connects to users in rural and remote areas either directly or via low-altitude gateways, which enables users in these ...

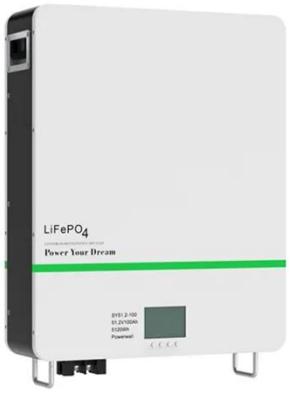
From Ground to Sky: Architectures, Applications, and ...

Jun 17, 2025 · Different from the conventional aerial communication systems, LAWN's distinctive feature is its

tight integration of functional planes in which multiple functionalities continually ...

A Low-Altitude Network Base Station Planning Model Based ...

Nov 30, 2024 · We construct a decision model for base station placement and utilize the PPO algorithm to determine optimal base station configurations. Through reinforcement learning ...



Energy efficient deployment of aerial base stations for ...

Apr 15, 2024 · Unmanned aerial vehicles (UAVs) are popularly considered as aerial base stations in a Low-Altitude Platform (LAP) to provide wireless connections to ground users in disaster ...

The Global Low-Altitude Economy, Q1 2025: ...

Mar 12, 2025 · Q1 2025 Global Low-Altitude Economy Report: Discover key developments in urban air mobility (UAM), eVTOLs, drone delivery,

vertiports, ...

Multiobjective Modular Strategic Planning Framework for Low-Altitude

Oct 16, 2023 · This article introduces a multimetric multiconstraint strategic path planning framework applicable to unstructured urban airspace. The planner is based on a modular and ...

Airspace Geofencing and Flight Planning for Low-Altitude, ...

Jan 1, 2022 · Airspace geofencing is a key capability for low-altitude Unmanned Aircraft System (UAS) Traffic Management (UTM). Geofenced airspace volumes can be allocated to safely ...

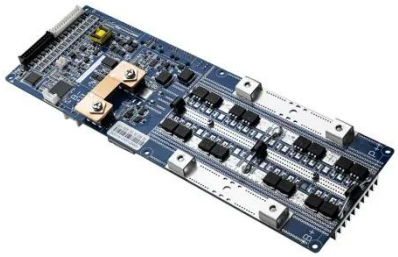
Toward Multiple Integrated Sensing and Communication Base Station

Jun 22, 2022 · The collaborative sensing of multiple Integrated sensing and communication (ISAC) base stations is

one of the important technologies to achieve intelligent transportation. ...

The Strategic Deployment on Low Altitude Network

May 15, 2025 · This paper proposes a new method for spa-tial coverage planning in low-altitude network, which uses the lens antenna step reduction method based on the antenna gain to ...



Reference Document for Low-Altitude Intelligent ...

Dec 17, 2024 · The Low-Altitude Intelligent Connected System Reference Architecture focuses on a widely accepted reference architecture for low ...

A survey of radio propagation channel modelling for low altitude ...

Apr 22, 2020 · 3rd Generation Partnership Project (3GPP) started focusing to handle required data rate,

latency, altitude and speed limitations, interference mitigation, evaluation scenarios ...

6G Non-Terrestrial Networks Enabled Low-Altitude ...

May 6, 2024 · Abstract--The unprecedented development of non-terrestrial networks (NTN) utilizes the low-altitude airspace for commercial and social flying activities. The integration of ...

Shenzhen Launches Standard System Guide to ...

Dec 28, 2024 · Shenzhen Launches Standard System Guide to Develop Low Altitude Economy The guide aims to standardize the low-altitude economy ...

Toward Realization of Low-Altitude Economy Networks: Core ...

Apr 30, 2025 · Low-Altitude Flight Service System: The system is designed for enterprise users to meet the diverse

needs of low-altitude flight operations. Through task planning, route ...

The Strategic Deployment on Low Altitude Network

May 16, 2025 · First, communications network coverage of an existing airspace of a low-altitude network requires that a 4.9 GHz frequency band and a 2.6 GHz frequency band of a ground ...

Managing Sets of Flying Base Stations Using Energy Efficient ...

May 15, 2023 · In this paper, we propose a method of solving a multi-FBS 3D trajectory problem that considers FBS energy consumption, operation time, flight distance limits, and inter-cell ...

Toward Practical Low-Altitude Economy Networking: ...

Jun 15, 2025 · Design, simulation, practical trials, and standardization of communications architectures and protocols for LAE. Sustainable real-world

deployment strategies and use ...

Integrated Sensing and Communication for Low ...

Apr 7, 2025 · Driven by the prosperous vision of a low-altitude economy (LAE), the low-altitude airspace is expected to be exploited for commercial and social ...

Toward Low-Altitude Airspace Management and UAV ...

Jun 11, 2025 · The low-altitude economy (LAE) is rapidly advancing toward intelligence, connectivity, and coordination, bringing new challenges in dynamic airspace management, ...

Base Station Deployment Scheme for Low-Altitude

Dec 29, 2024 · Integrated sensing and communication (ISAC) is a key technology of future fifth-generation-advanced (5G-A) and sixth-generation

(6G) mobile communication system

ZTE's Integrated Sensing and Communication ...

Jan 22, 2024 · The introduction of ISAC enables 5G base stations to detect the position, speed, trajectory of low-altitude drones, thereby enabling the 5G ...

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