

PDEOZE PowerContainer

Base station power consumption after 5G popularization



Overview

How can we improve the energy efficiency of 5G networks?

To improve the energy efficiency of 5G networks, it is imperative to develop sophisticated models that accurately reflect the influence of base station (BS) attributes and operational conditions on energy usage.

Does a balanced dataset improve energy prediction of 5G base stations?

For energy prediction of 5G base stations, this thesis finds that using a more balanced dataset, in terms of the number of samples for each product, has a positive impact for the ANN and the Gradient Boosted Trees model while the linear regression performs worse.

Should power consumption models be used in 5G networks?

This restricts the potential use of the power models, as their validity and accuracy remain unclear. Future work includes the further development of the power consumption models to form a unified evaluation framework that enables the quantification and optimization of energy consumption and energy efficiency of 5G networks.

Can machine learning predict energy consumption for 5g/4g radio base stations?

To further develop energy modelling methodology and attempt to answer the questions presented in the previous section, different machine learning algorithm's ability to predict energy consumption is investigated for 5G/4G radio base stations.

Do base stations dominate the energy consumption of the radio access network?

Furthermore, the base stations dominate the energy consumption of the radio access network. Therefore, it is reasonable to focus on the power consumption of the base stations first, while other aspects such as virtualization of compute

in the 5G core or the energy consumption of user equipment should be considered at a later stage.

Can 5G reduce energy consumption?

However, the energy consumption of 5G networks is today a concern. In recent years, the design of new methods for decreasing the RAN power consumption has attracted interest from both the research community and standardization bodies, and many energy savings solutions have been proposed.

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Importantly, this study item indicates that new 5G power consumption models are needed to accurately develop and optimize new energy saving solutions, while also considering the ...

This paper proposes a power control algorithm based on energy efficiency, which combines cell breathing technology and base station sleep technology to reduce base station energy ...

Have you ever wondered how much energy our hyper-connected world is consuming? 5G base stations, the backbone of next-gen connectivity, now draw 3-4 times more power than their 4G ...

The main power consuming components of a base station are categorized in the same manner by almost all the discussed models, though the parameters which scale the ...

To further explore the energy-saving potential of 5 G base stations, this paper proposes an energy-saving operation model for 5 G base stations that incorporates communication caching ...

5G base stations use high power consumption and high RF signals, which require more signal processing for digital and electromechanical units, and also put greater pressure ...

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The fifth generation of the Radio Access Network (RAN) has brought new services, technologies, and paradigms with the corresponding societal benefits. However,

These 5G base stations consume about three times the power of the 4G stations. The

main reason for this spike in power consumption is the addition of massive MIMO and ...

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5G base stations use high power consumption and high RF signals, which require more signal processing for digital and electromechanical units, and also put greater pressure on AU modules. ...

In this thesis linear regression is compared with the gradient boosted trees method and a neural network to see how well they are able to predict energy consumption from field data of 5G ...

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