Electricity big data analysis of base station electricity consumption

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What is the largest energy consumer in a base station?
The largest energy consumer in the BS is the power amplifier,which has a share of around 65% of the total energy consumption . Of the other base station elements,significant energy consumers are: air conditioning (17.5%),digital signal processing (10%) and AC/DC conversion elements (7.5%) .

Is there a direct relationship between base station traffic load and power consumption?
The real data in terms of the power consumption and traffic load have been obtained from continuous measurements performed on a fully operated base station site. Measurements show the existence of a direct relationshipbetween base station traffic load and power consumption.

What percentage of the energy consumption comes from ran (radio access network)?
Figure 1.1(c) then shows that of the energy consumption of the network,70%-90%comes from the RAN (Radio Access Network) of which 70% of the energy consumption comes from the Radio Base Stations,see Figure 1.1(d).

Can a neural network predict energy consumption from field data?
Mathematical optimization of energy consumption requires a model of the prob-lem at hand. 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 radio base stations.

The real data in terms of the power consumption and traffic load have been obtained from continuous measurements performed on a fully operated base station site.

BSs are one of the most power consuming elements of a 5G network. It is important to model their energy consumption for analyzing overall energy efficiency of a ...

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Thus, the objective is to develop a machine learning model to estimate the energy consumption of 5G base stations, taking into account different engineering configurations, traffic conditions, ...

This study introduces a predictive modeling approach for base station energy consumption by combining Seasonal and Trend decomposition using Loess (STL) and Long Short-Term ...

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To address this, we propose a novel deep learning model for 5G base station energy consumption estimation based on a real-world dataset. Unlike existing methods, our approach integrates ...

When symbol shutdown is activated, the AAU switches off the MCPAs, and its power consumption is reduced to the sum of the baseline power consumption, P0, the baseband ...

An energy consumption optimization strategy of 5G base stations (BSs) considering variable threshold sleep mechanism (ECOS-BS) is proposed, which includes the initial ...

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