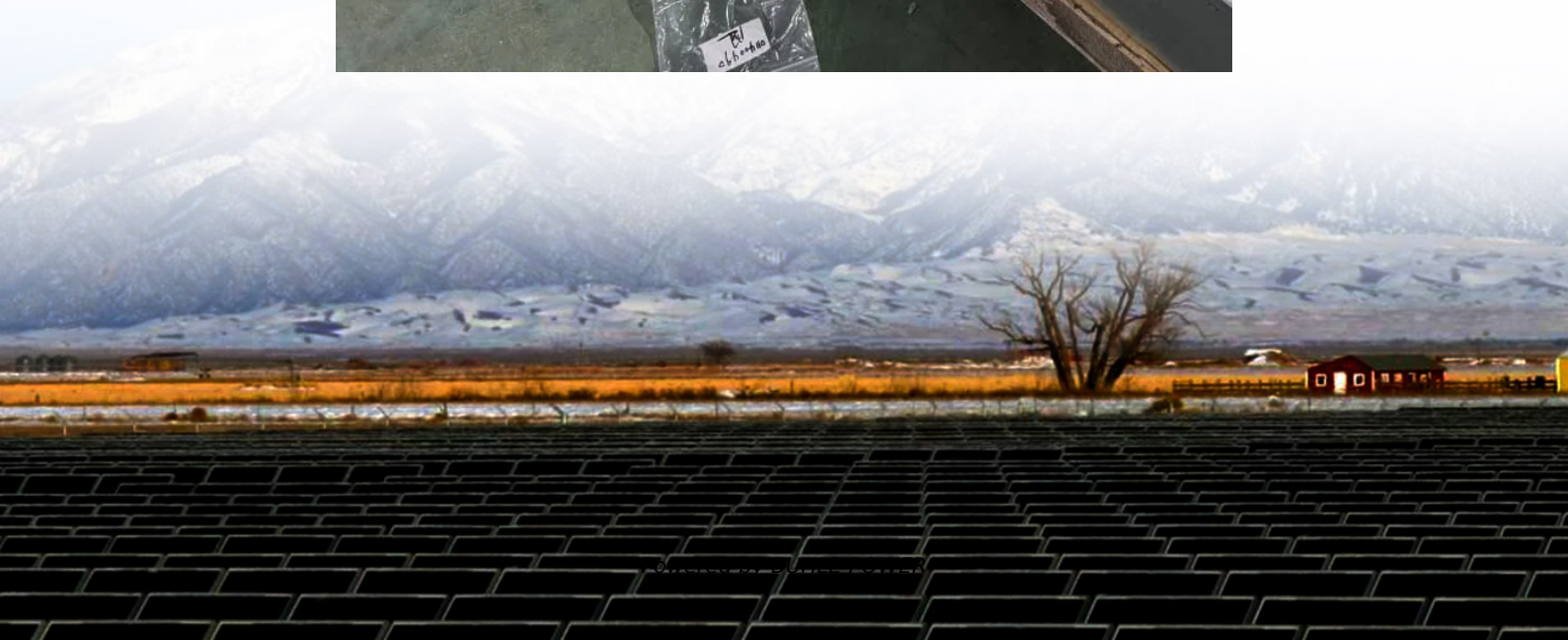


Transformer for base station of communication engineering





Overview

Power transformers play a vital role here: they adjust the mains voltage to levels compatible with the base station's operational needs, supplying power to critical systems such as communication devices, air conditioning units, and lighting. Are pre-trained Transformer models optimized for wireless communications data?

However, existing pre-trained transformer models (trained on images or text) are not optimized for wireless communications data, and their fine-tuning on such data may not provide the best performance. On the other hand, transformer models that are trained on wireless communications data do not exist nowadays.

How do we attend to relations between previous transformer outputs and current inputs?

To attend to relations between previous transformer outputs and current inputs, a similar mechanism is applied to generate self-attended feature maps from previous outputs, and then to generate an attention map between the current input and previous outputs (right-most blocks in Fig. 1).

What is a transformer in NLP?

A transformer is an NN architecture proposed originally for NLP . Owing to their remarkable ability to capture complex patterns and relationships in data, transformers have been adapted for various applications, including CV and wireless communications. This is because they have several advantages over classical DNNs.

What is a Transformer architecture?

There is a variety of transformer architectures depending on the application. However, all architectures share the same fundamental principle: the attention mechanism. The main components of transformers, as shown in Fig. 1, are input embedding, positional encoding, and multi-head attention, which are discussed next.



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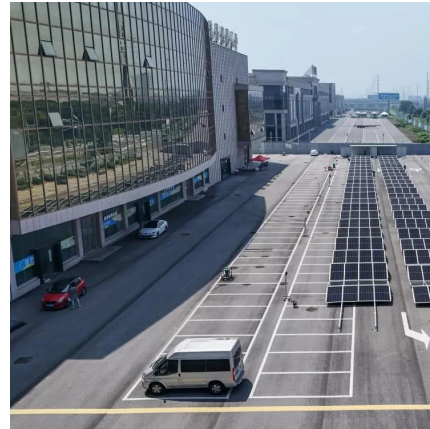
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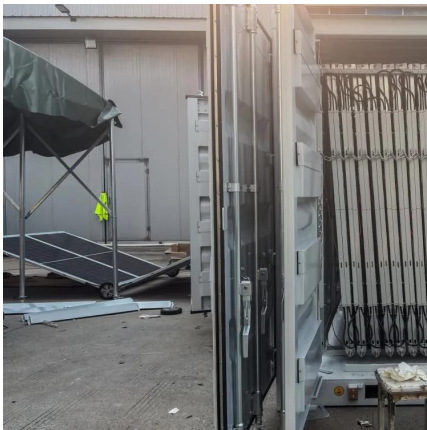
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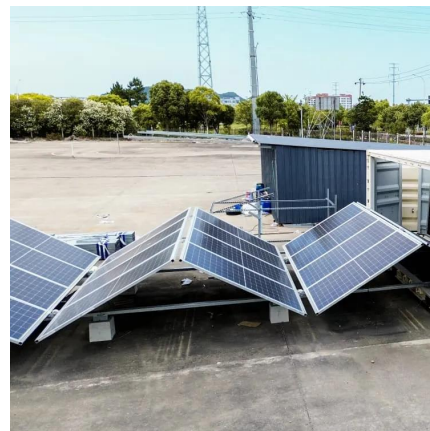
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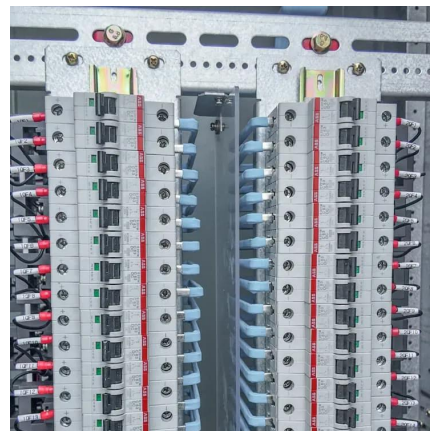


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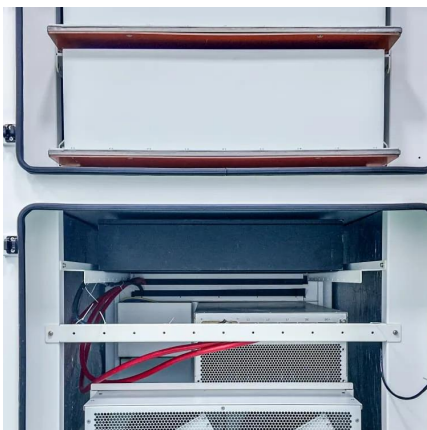
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