TU DUBLIN
OLLSCOIL TEICNEOLAÍOCHTA BHAILE ÁTHA CLIATH
TECHNOLOGICAL UNIVERSITY DUBLIN

Hothouse

Technology to Licence T-21-002

Smart Digital Pre-distortion (DPD) for linearizing Power Amplifier (PA)

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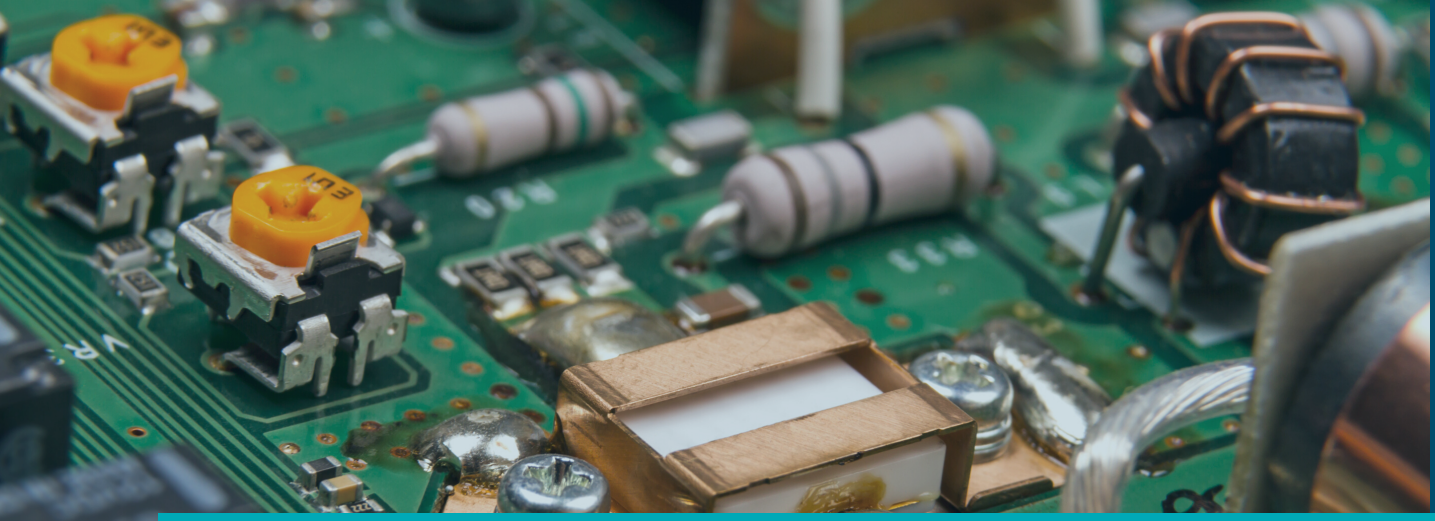
Overview

Researchers at TU Dublin have developed Smart Digital Pre-distortion (DPD) for linearizing Power Amplifier (PA).

Power Amplifiers (PAs) are very important part in mobile networks, as they amplify small signals to big signals to be able to be sent by antenna. Therefore they use significant amount of energy, and ideally most of the energy should be converted to the output power for the signal to be transmitted. Unfortunately PAs have nonlinear behaviour, meaning that they don't always transfer all the power from their input to their output and a fraction of this energy is wasted.

There are mainly two types of PA available; a) very nonlinear and highly efficient PA, and b) more linear and low efficient PAs. There is generally a trade-off between efficiency and linearity, and employing group a causes signal leakage, meaning that different users will suffer from interferences, and group b suffers from costly non-efficient operation.

There are some solutions known as linearization methods, and one of the most popular approaches is called Digital Pre-Distortion (DPD) which improve the linearity of a PA in a way that it works both more linear and more efficient. This means that the energy can be used lot more efficiently. Nowadays DPD is an essential part of mobile antenna towers known as base stations (BTS). A DPD tracks PA's behaviour and according to this behaviour the input signal is changed and manipulated before passing through PA in a way that PA is forced to work more linearly and therefore the energy waste can be partially avoided.



Advantages

The advantages of the system are:

- The DPD is a strong asset beyond 5G/6G systems
- Improves the efficiency of the solution
- No Extra Cost to Make
- More accurate Manipulation of the signal input
- Easier to identify problematic areas
- More efficient operation

Opportunity

This solution is a new DPD technique that improves the efficiency even further and it does not cost more to make. The new technique concentrates on PA's behaviour more accurately and the manipulation on input signal is done more effectively emphasizing on problematic areas in behaviour's track instead of all areas resulting more accurate and more efficient operation.

Stage of Development

TU Dublin is seeking commercial partners to assist in bringing this technology to market.

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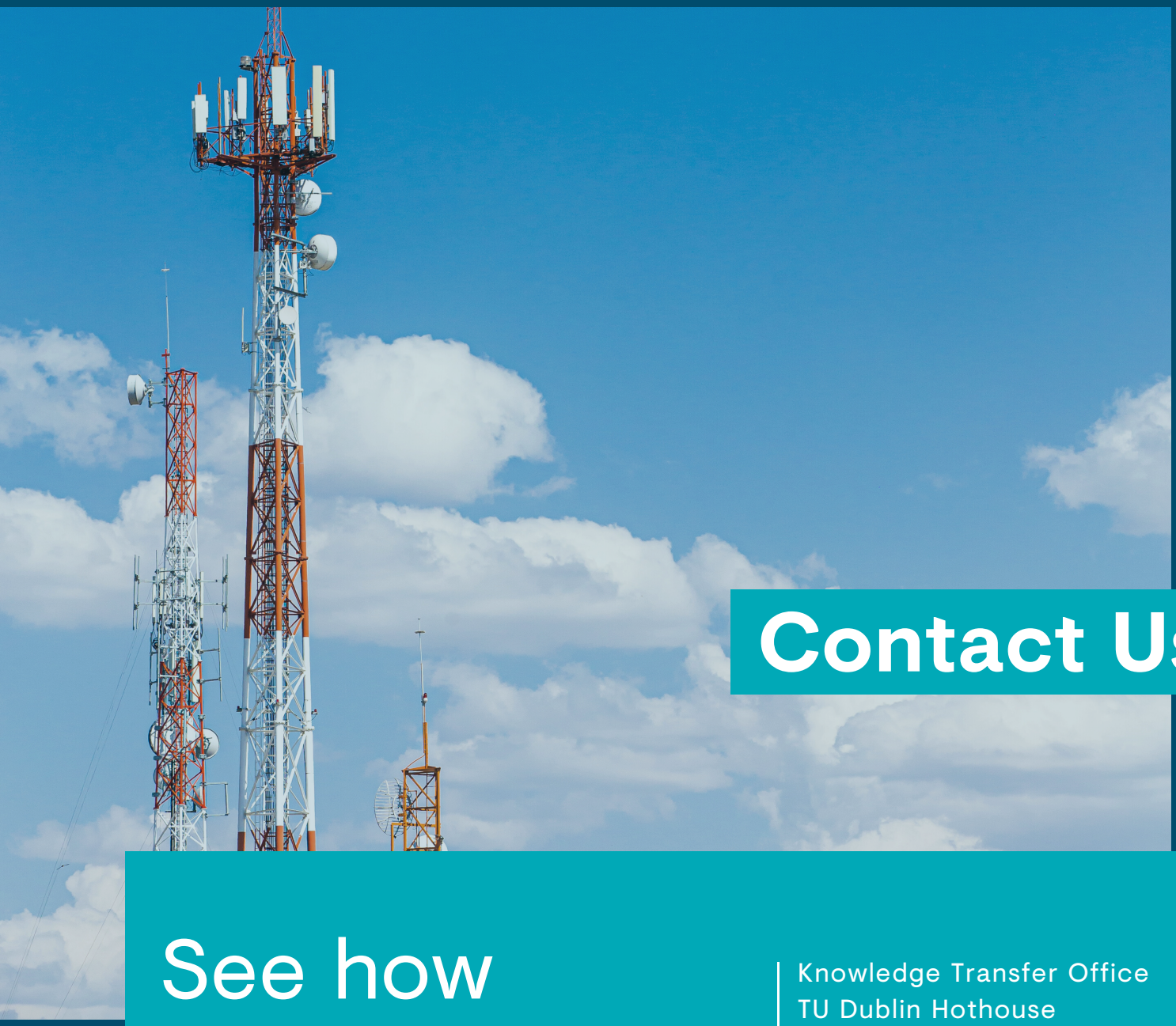

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See how TU Dublin Technologies can work with your business.

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