Innovative Hierarchic Beamforming with limited Feedback Between Remote Radio Heads and Baseband-Unit Pool in Cloud RAN (BIRAD)

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The Problem

Joint transmission (JT), in which adjacent transmitters, coordinate their transmission jointly to form a cluster which serves several mobile terminals, is an important tool for enhancing spectrum utilization. Not surprisingly, there is a constant growing demand for high data rate. Both the demand and the rapid increase in the number of cellular consumers have led to an aggressive frequency reuse, thus enhancing co-channel interference between adjacent cells. Such interference significantly degrades system throughput, particularly to cell edge users.

The Solution

We propose a novel scheme that transforms the interference into a useful signal.

The Commercial Benefit

We present a novel channel state information sharing scheme that enhances spectrum utilization by making joint transmission in C- RAN practical. The are the main characteristics:

Drastically reduces the large overhead in acquiring global channel state information for joint transmission.

Significantly reduces fronthaul data rate.

Reduces the number of data streams delivered from the BBU pool to each RRH, while increasing the overall network throughput.

Facilitates joint transmission in clusters in which the smart remote radio heads are interconnected by limited-rate link and/or with limited fronthaul.

Market Potential

The global 5G technology market is bound to reach roughly USD 73 MN by the end of 2023, at an astounding CAGR of 21% during forecast period (2017-2023). 5G, the up-coming fifth-generation wireless broadband technology will provide higher speed and better coverage than all other connectivity. Factors making a positive impact on this market are the shift toward new broadband technology, huge network coverage, growing demand for high data speed, and stable growth in the mobile data traffic, also increasing demand for machine-to-machine communication in organizations and the increasing demand for broadand.

Target Markets/Industries

5G technology market

Intellectual Property

Patent pending

Team: Primary Inventor

Dr. Yair Noam

Dr. Noam is a Senior Lecturer at the Faculty of Engineering, Bar-Ilan University. In the years 2011-2013 he was Postdoctoral fellow in Wireless Systems Laboratory in the Electrical Engineering at Stanford University. He received his Ph.D. from Tel Aviv University and M.Sc. (summa cum laude) from Ben-Gurion University, both in Electrical Engineering.

Future Research

The proposed scheme is currently being further perfected by incorporating improved power allocation schemes. Another aspect for future research is to combine the proposed schemes with different type of scheduling.

The Opportunity

We offer licensing of our patent sponsored research to qualified companies

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