Journal Watch

IEEE Transaction on Vehicular Technology, February 17

Chethan Kumar A
SPC Lab, Dept. of ECE, IISc

1 April, 2017

Joint Block Sparse Signal Recovery Problem and Applications in LTE Cell Search

Authors: Neelakandan Rajamohan, Amrutraj Joshi, and Arun Pachai Kannu.

GMMV Model:

$$y^{(m)} = A^{(m)} x^{(m)} + w^{(m)}, \quad m = 1, \ldots, M. \tag{1}$$

Contributions:

- Proposed greedy and convex programming based recovery algorithms and establish recovery guarantees.
- Application of joint block sparse recovery problem (Cell search in LTE HetNets)

Greedy Algorithms:

- Subspace Correlation Pursuit (SCP)-GMMV algorithm:
  $q_k = \max \sum_m ||A_i^{(m)*} r_{k-1}^{(m)}||$
- Subspace Matching Pursuit (SMP)-GMMV algorithm:
  $q_k = \max \sum_m ||A_i^{(m)*} (A_i^{(m)*} A_i^{(m)})^{-1} A_i^{(m)*} r_{k-1}^{(m)}||$
- Single step SMP-SSMP-GMMV algorithm

Convex programming based Algorithm:

- Relaxed norm minimization

$$\min ||U||_{rx} s.t. ||F||_F \leq \sigma$$

$$U_{i,m} = A_i^{(m)} x_i^{(m)} \quad F^{(m)} = y^{(m)} - A^{(m)} x^{(m)}$$

QoS-Aware Energy-Efficient Downlink Predictive Scheduler for OFDMA-Based Cellular Devices

Authors: Karim Hammad, Serguei L. Primak, Mohamad Kalil, and Abdallah Shami.

Goal: Perform predictive EE scheduling s.t. QoS constraints.

Power P_t:

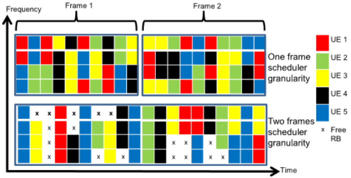
$$P_t = m_{idle} P_{idle} + \bar{m}_{idle}(P_{on} + P_{rx} + P_{BB} + P_{RF})$$

$$P_{BB} = 1.923 + (2.89 * 10^{-3} * B_r)$$

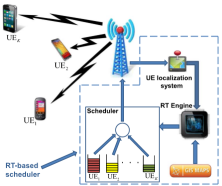
$$P_{RF} = 1.889 - (1.11 * 10^{-3} * P_r)$$

Key Idea:

- Buffer BS DL traffic
- Transmit in minimum number of TTIs



- DL channel model using Ray Tracing approach



Optimal scheduler problem

$$\min \quad E_{total}$$

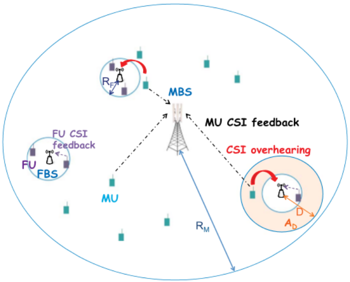
s.t. GBR, Interference constraint,

and UE circuit time constraint.

Distributed Resource Allocation With Local CSI Overhearing and Scheduling Prediction for OFDMA Heterogeneous Networks

Authors: Megumi Kaneko, Toshihiko Nakano, Kazunori Hayashi, Takuya Kamenosono, and Hideaki Sakai.

Goal: Maximize sum rate of FUs, mitigating interference to the MUs with no additional signaling.



Resource allocation at FBS

- Stage 1: Subcarrier allocations

  Allot subcarrier to FU $\rightarrow$ highest SNR

- Stage 2: Power allocation

Power allocation

$$
\begin{aligned}
&\max_{P_n} \sum_{n=1}^{N} \log(1 + P_n^F \Gamma_n) \\
s.t.\quad & C_1 : \sum_{n=1}^{N} P_n^F \leq P_{max}^F, \\
& C_2 : \quad P_n^F \geq 0, \\
& C_3 : \quad P_n^F \leq \frac{\delta}{g_n} \quad , \forall n.
\end{aligned} \tag{2}
$$

- Proposed method mitigated interference to neighbouring MUs'

Other interesting papers

- A Mobility Analytical Framework for Big Mobile Data in Densely Populated Area

  Yuanyuan Qiao, Yihang Cheng, Jie Yang, Jiajia Liu, and Nei Kato

- Efficient Compressive Sensing Detectors for Generalized Spatial Modulation Systems.

  L. Xiao, P. Yang, Y. Xiao, S. Fan, M. Di Renzo, W. Xiang, and S. Li

- Cooperative Jamming-Aided Secrecy Enhancement in P2P Communications With Social Interaction Constraints

  L. Wang, H. Wu, and G. L. Stuber