

**COMPRESSED SENSING-BASED RECEIVERS FOR
SPATIAL MODULATION-MIMO NOMA SYSTEMS**

M. Thuvarakan

(188269T)

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Department of Electronic and Telecommunication Engineering

University of Moratuwa
Sri Lanka

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Abstract

Spatial modulation (SM) offers a promising solution to the demands of up-and-coming wireless networks. In this thesis, the Generalized Orthogonal Matching Pursuit (gOMP) algorithm is introduced into the receiver of NOMA aided SM-MIMO system to improve processing speed and reduce computational complexity. Furthermore, we present comprehensive analysis of the latest research contributions for NOMA based SM-MIMO system which has considerable attention recently. In addition, we focused our attention on the CS based receivers for NOMA based SM and compared the complexity which contributes performance degradation, with typical ML detectors. Detection of SM can be thought of as a process of sparse reconstruction, due to its an inherent property of sparsity. The sparse signal can be detected by Compressed sensing (CS) algorithm which became competitive alternatives. Some modified CS detection algorithms which showed improved performance compared to the conventional CS based once, have not been adopted in NOMA based SM-MIMO system. We formulate the recovery problem by exploiting the SM-MIMO communication system as downlink power domain NOMA where the base station supports more users in downlink scenario. Also, we deployed a low complexity pairing in this system to increase sum throughput. In addition, we analyzed the behavior of gOMP algorithm at this system. Simulations show that the gOMP detector outperforms conventional CS detection schemes.

Keywords:

Spatial Modulation (SM), Non-Orthogonal Multiple Access (NOMA), Compression Sensing (CS), Generalized Orthogonal Matching Pursuit (gOMP).

Declaration

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The above candidate has carried out research for the Masters thesis under my supervision.

Signature of the supervisor

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