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## Secure High Performance Communications In Mimo Ad Hoc Networks

<sup>1</sup>Anbarasan.S, <sup>2</sup>Ganesh.P

<sup>1</sup>PG Scholar, Computer Science and Engineering

<sup>2</sup>Assistant Professor, Computer Science and Engineering

Surya Group Of Institutions - Vikravandi, Tamilnadu

E-mail:[anbu.179206@gmail.com](mailto:anbu.179206@gmail.com)

Abstract \_To meet the ever increasing communication need, it is important to improve the network throughput while guaranteeing transmission reliability .Multiple-input-multiple-output (MIMO) technology can provide significantly higher data rate in ad hoc networks where nodes are equipped with multi-antenna arrays. Although MIMO technique itself can support diversity transmission when channel condition degrades, the use of diversity transmission often compromises the multiplexing gain and is also not enough to deal with extremely weak channel. Instead, in this work, we exploit the use of cooperative relay transmission (which is often used in a single antenna environment to improve reliability)in a MIMO-based ad hoc network to cope with harsh channel condition. Design both centralized and distributed scheduling algorithms to support adaptive use of cooperative relay transmission when the direct transmission cannot be successfully performed. Our algorithm effectively exploits the cooperative multiplexing gain and cooperative diversity gain to achieve higher data rate and higher reliability under various channel conditions. And also provides Rijndael Encryption method to secure the communication in MIMO ad hoc network.