

**CHENNAI – PONDICHERRY**

**ENHANCING COLLUSION RESILIENCE IN REPUTATION SYSTEMS**

**ABSTRACT**

Real-world applications, such as peer-to-peer (P2P) networks, e-commerce and social networks, usually employ reputation systems to provide guidance in selecting trustworthy node for high system reliability and security. A reputation system computes and publishes reputation score for each node based on a collection of opinions from others about the node. However, collusion behaviors impair the effectiveness of reputation systems in trustworthy node selection. Though many reputation calculation methods have been proposed to mitigate collusion's influence, little effort has been devoted to specifically tackling collusion. Based on the important collusion behavior characteristics in reputation evaluation and influence on reputation values, we propose a basic collusion detection method to specifically detect suspicious collusion behaviors in pairs. We further optimize the method by reducing the computing overhead. We also propose two pre-processing methods to firstly identify partial reputation raters of a node that are more likely to be colluders before applying the collusion detection method on them, thus reducing the collusion detection overhead. Extensive experimental results show that our proposed methods can significantly enhance the capability of existing reputation systems to detect collusion with low overhead. Also, the pre-processing methods are effective in reducing the collusion detection overhead without affecting the collusion detection accuracy.