

## ABSTRACT

*Wireless Sensor Network (WSN) is a wireless network infrastructure that uses sensor nodes to monitor physical or environmental conditions such as temperature, vibration, noise. One of the characteristics of wireless sensor network is limited power. One attempt to save energy consumption is to avoid the collision that can occur when two adjacent sensor sends packets to the same receiver in the same time. Data collision makes the receiver does not receive data packet from sender so packet delivery that produced getting lower but energy consumption that used getting higher because the transmitter have to resend the data until its received. Controls of nodes distribution considered able to resolve the issue. By control the placement of the nodes will set the ideal distance between nodes in order to reduce the collisions.*

*In this final project was discussed the influence of the number of active nodes transmits packet simultaneously and interval of delivery data packet with various types of node deployment. performance metrics that we analyzed is packet delivery ratio, throughput, delay, dan energy consumption. We use AODV as routing protocol for sending data packets. For Modeling and simulation of scenario wireless sensor network we use NS version 2.35 as Simulator for this project. And using Constant Bit Rate as traffic data packets. For the network simulation uses IEEE 802.15.4 standard.*

*Based on simulation results show in condition the number of active nodes transmits packet simultaneously, for packet delivery ratio regular hexagonal 36.10% and 15.82% is better than random and grid . For throughput, regular hexagonal 37.74% and 18.37% is better than random and grid. For energy consumption, regular hexagonal 6.42% and 11.05% is less than random and grid. But in condition of sending data packets by arranging time transmission between the sending node show that for packet delivery ratio grid 12.92% and 26.51% is better than regular hexagonal and random. For throughput, grid 12.16% and 28.21% is better than regular hexagonal and random.*

**Keywords:** WSN, AODV, Random Deployment, Grid Deployment, Regular Hexagonal Deployment

