# PERFORMANCE OF MACHINE LEARNING-BASED NETWORK SLICING METHODS IN 5G AND BEYOND COMMUNICATION

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| **ABSTRACT**  In recent years, advancements in communication technologies have given rise to needs such as high transmission speed, reliability, and low latency. Improvements in these aspects are crucial in fourth-generation (4G) communication technologies. Following 4G, the Network Slicing method introduced with 5G allows the network infrastructure to be divided to meet different service requirements, enabling flexible and efficient utilization of network resources. The performance of machine learning-based 5G network slicing methods was tested by simulating 3rd Generation Partnership Project (3GPP) compliant error-prone users and base stations. Six different machine learning methods, along with their parameter spaces, were used in tests for network slicing, employing four methods (eMBB, M1oT, V2X, and URLLC). The performance of these classifier models was analyzed using both error-prone user data and ideal user data. The simulation data were used to conduct a performance analysis of machine learning methods mentioned in the literature, investigating their usability. A 96.56% accuracy rate was achieved using the multi-layer perceptron method with error-prone user data, and a 98.73% accuracy rate was achieved with ideal user data. Additionally, the relationships between the system cycle and user count, as well as the data rate reduction system, were examined in the simulation. |

# Keywords: 5G and Beyond Communication, Machine Learning, Network Slicing