Abstract:

- Rapid increase and complexity of IPv6 network traffic
- Adoption of lightweight KNN optimization algorithm for DoS intrusion detection in IPv6 network environment
- Double dimensionality reduction of features through information gain rate
- Optimization of sample Euclidean distance measurement using information gain rate as weight
- Improved overall detection performance for IPv6 network traffic characteristics.

Introduction:

- Exhaustion of traditional IPv4 network addresses and the development of NAT technology
- Introduction of IPv6 protocol to address the problem of insufficient addresses
- Differences between IPv6 and IPv4 in terms of address availability and protocol structure
- Increase in DoS attacks related to IPv6 despite the introduction of IPv6 protocol
- Challenges in detecting DoS attacks in IPv6 networks due to increasing traffic volume and poor adaptability of IDS based on specific rules.