Random Access in IoT Using Naïve Bayes Classification

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Abstract : This paper deals with the random access procedure in next-generation networks and presents the solution to reduce total service time (TST) which is one of the most important performance metrics in current and future internet of things (IoT) based networks. The proposed solution focuses on the calculation of optimal transmission probability which maximizes the success probability and reduces TST. It uses the information of several idle preambles in every time slot, and based on it, it estimates the number of backlogged IoT devices using Naïve Bayes estimation which is a type of supervised learning in the machine learning domain. The estimation of backlogged devices is necessary since optimal transmission probability depends on it and the eNodeB does not have information about it. The simulations are carried out in MATLAB which verify that the proposed solution gives excellent performance.

Keywords : random access, LTE/LTE-A, 5G, machine learning, Naïve Bayes estimation
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