ELECTRICAL ENGINEERING DEPARTMENT

Machine learning on the Backscatter edge IOT devices

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Overview In this project, we propose to implement modern machine learning algorithms in the modern communication technologies 5G and IOT to make enhancement on two main problems that face the IOT technology. IOT devices need a continuous power supply to maintain the functionality of its operations. Backscatter communication does not require any active RF devices that make the industry of IOT devices lower cost and reduce size. We provide a study of machine learning and deep learning networks on backscatter to enhance the SNIR against backscatter nodes collisions and adjustable antenna impedance. The second main problem that faces IOT is data analytics and big data computations, a smart device sends the data to the cloud network which has a big practical problem which is the risk of personal information being stolen, this requires intensive computations which causes latency and delay. Some applications need a real time data analysis and high security. Edge machine learning and deep neural models is a recommended solution that provides the ability to process the data locally and gives a live share data with other microcontrollers. Along with making the personal data like health data more secure and fast response analysis. We are going to study the best algorithms and optimize power efficiency, data rate and cost.