

Future Technologies in Data Driven Approaches and Adaption

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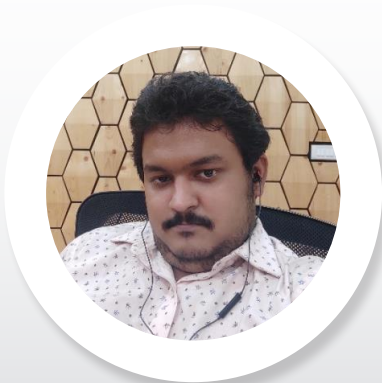
FEDERATED LEARNING- The Future of Distributed Machine Learning

In today's era, the exponential growth of data and its management is a matter of concern. Machine learning has shown its efficacy in multiple application areas. But machine learning on decentralized data was a hectic task since last decade. A novel technology has gained much importance in recent days i.e., federated learning which deals with training on decentralized and distributed data along with preservation of its privacy. Smartphone data being privacy-sensitive is used for locally training a global model which further is aggregated to generate an updated global model which again is distributed among multiple clients. This paper focuses on presenting the efficacy of federated learning by epitomizing an architecture showing the working mechanism of the technology. Further, this paper exhibits an intersection of on-device machine learning, privacy preservation technology and edge computing i.e., federated learning. Also, we have used TensorFlow Federated, an open source platform to simulate federated learning tasks for MNIST and extended MNIST (E-MNIST) datasets. Further, the results contain the loss and accuracy parameters for ten iterations repeated for six optimizer states (Opt st) for each dataset. The peak accuracy that we achieved for MNIST and E-MNIST datasets are 0.843 and 0.853 respectively by using federated averaging algorithm. Further, the minimum loss value that we obtained for MNIST and E-MNIST datasets are 0.652 and 0.646 respectively. The execution time for implementing the algorithm for each dataset is presented in a graphical manner. Finally, certain application areas where federated learning technology has aided are scrutinized..

Biography

Saneev Kumar Das has completed his M.Tech. in Computer Science and Engineering in 2020 at an age of 25 years. During his M.Tech. he has published 8 research articles including one SCI-E indexed journal and seven conference articles of reputation across the world. He is known for his works in the latest domains in computer science. He has been awarded with Best Paper Award multiple times and has been selected in the technical programme committees of diverse conferences of repute. He is currently serving at Centurion University of Technology and Management, Bhubaneswar as a faculty in the Dept. of C.S.E.

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