Electrical & Computer Engineering

S E M I N A R

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Distributed Machine Learning for Intelligent Edge Computing Systems

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Abstract—With the rapid increase in data collected from various edge devices across distributed networks, there is a pressing need for innovative solutions to harness intelligence at the network edge. Traditional cloud-based centralized learning methods won't suffice. Instead, federated learning, an emerging approach, keeps data local at its source, avoiding the need for centralization on a cloud server. This method pushes model updates to the edge and aggregates local updates to train a global model on a shared parameter server. However, federated learning presents challenges, including poor model convergence compared to centralized learning and device lag due to heterogeneity and network unreliability. To empower distributed edge intelligence efficiently, optimizing machine learning models to utilize decentralized data, adapting to diverse device capabilities, and complying with network constraints are crucial. In this talk, I will delve deeper into these insights and share my research on bridging the gap between centralized and federated learning. My strategy encompasses three key areas: (i) enhancing processor utilization through relaxed synchronization and tackling memory-efficient problems in distributed networks, (ii) developing parallel algorithms that accelerate model learning via data summaries and facilitate linear scaling in decentralized machine learning, and (iii) co-designing energy-efficient systems that make AI accessible at the edge, promoting green AI. To wrap up my talk, I will share some intriguing directions for future research.

When: Thursday, **25 April 2024,** 10:00 - 11:00
Where: Room 3107 Patrick F. Taylor Hall
Info: https://www.lsu.edu/eng/ece/seminar
Food: *Coffee, etc. will be served.*