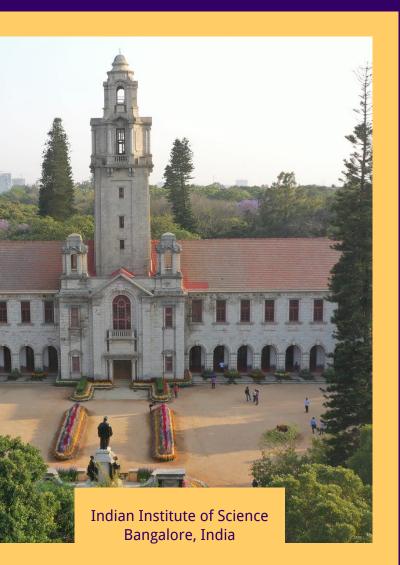# MACHINE LEARNING FOR 5G AND 6G WIRELESS COMMUNICATION

PROF. SUDHAN MAJHI

AI/ML has several applications in physical layer communication. It brings adaptive-ness to the transmitter as well as the receiver and improves the performance and latency of the communication system. The 3GPP standards already adopted AI/ML as a study material for 5G and 6G wireless communications. 6G AI Native radio also requires a solid knowledge of AI/ML for wireless communication; having this knowledge may help them find a job in these companies

Every Monday and Wednesday 8PM to 9:30 PM

CENTRE FOR CONTINUING EDUCATION
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SYLLABUS

Introduction to Python: Basic of Python programming. Introduction to Machine Learning: Overview of supervised, semisupervised and unsupervised, Regression Model, SVM, KNN, CNN, DNN, RNN, LSTM, GANs, Transfer learning, RL. Introduction to Wireless: Python code on Single carrier system, OFDM, MIMO, OTFS system. Wireless Communications: Source channel coding, channel coding, LDPC code decoding, Modulation classification, channel estimation, Classification of wireless signals Autoencoder (based on 3GPP Standard), CSI compression and feedback (based on 3GPP Standard), Beamforming and beam Management (based on 3GPP Standard), PAPR reduction, Spectrum sensing, successive inference cancellation for NOMA Signal Estimation and Detection: AL/ML based Parameter estimation, IF estimation, symbol rate estimation, STO and CFO estimation, MIMO/OFDM/OTFS detectors, Denoising signals. Spectrum sharing and resource allocation: Resource allocation, Spectrum sharing, Power allocation using reinforcement learning (RL) and deep RL.

ELIGIBILITY

Suitable for B.Tech, M.Tech and PhD students, (4th year B.Tech with ECE are eligible)

PREREQUISITES

Wireless Communication

WHO SHOULD ATTEND

Students from all IIT's and Universities, Working professionals working in wireless communication domains specifically from Samsung, Qualcomm, Nokia, Mediatek, Mavenir, Tejas Networks.