National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Bayesian Neural Network for Robust Estimation of Signal Source Number in Acoustic Sensor Data.
Speaker	: Sandip Ghosal.
Supervisor	: Prof. Sandip Ghosal.
Venue	: Room No. EC-411 (Microwave and Antenna Design Laboratory), ECE Dept. (Electrical Science Building)
Date and Time	: 29 Mar 2024 (04.30PM)
Abstract	: In most of the signal source separation approaches, it is assumed that the number of signal sources is known, and hence, it cannot ensure satisfactory separation performance in real-world scenarios. The existing source counting methods lead to inaccurate estimation in the presence of noise, a limited number of samples, and the presence of outliers. Unlike other methods, this treatise formulates the problem in terms of supervised learning and obtained excellent performance even in challenging scenarios. The work introduced a Bayesian neural network to learn the eigenvalue pattern of the covariance matrix of the signals and achieve superior accuracy in source number separation tasks. The BNN discerns the intricate pattern in the data and accounts for the noise and uncertainties using a probabilistic framework, leading to noticeably higher efficacy. Besides, the lightweight BNN overcomes the predicament of overfitting and does not require a significant amount of data.