National Institute of Technology Rourkela

Defence Seminar

Seminar Title	: Efficient 3D-Localization Algorithms in Underwater Acoustic Sensor Network Employing Optimization Methods
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Venue	: Convention Hall
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Abstract	: The Underwater Acoustic Sensor Network (UASN) is a specialized type of wireless sensor network designed for underwater environments. The underwater acoustic sensor network is a fundamental source for ocean exploration. The potential applications of UASN include seismic imaging, disaster prevention, mine reconnaissance, pollution monitoring, exploration of natural resources, military surveillance, etc. To acquire accurate results, implementing all applications of underwater sensor networks requires adequate network connection and communication technology. The precise placement of underwater sensor nodes must be identified to communicate effectively. The sensor nodes in UASN are intermittently deployed randomly in the three-dimensional scenario. Determining the three-dimensional localization of underwater sensor nodes is one of the most challenging tasks as compared to two dimensional. This motivates us to propose a three-dimensional localization algorithm in USAN. In this work, we proposed three range-free localization algorithms. The proposed algorithms I-LASP, RLCS-IUGWOM, and LAS-IUSSOT, are based on the compensation of the stratification effect for the improvement of the performance parameters such as localization accuracy, ranging accuracy, convergence rate, and execution time. Then, the fourth algorithm, EELBL-BR, addresses the localization of the large number of underwater sensor nodes using the clustering technique. The simulation, experimental validation, and analysis are performed employing a Python environment to evaluate the performance of the proposed schemes.