Activity Report

CIS chapter -IEEE Gujarat section

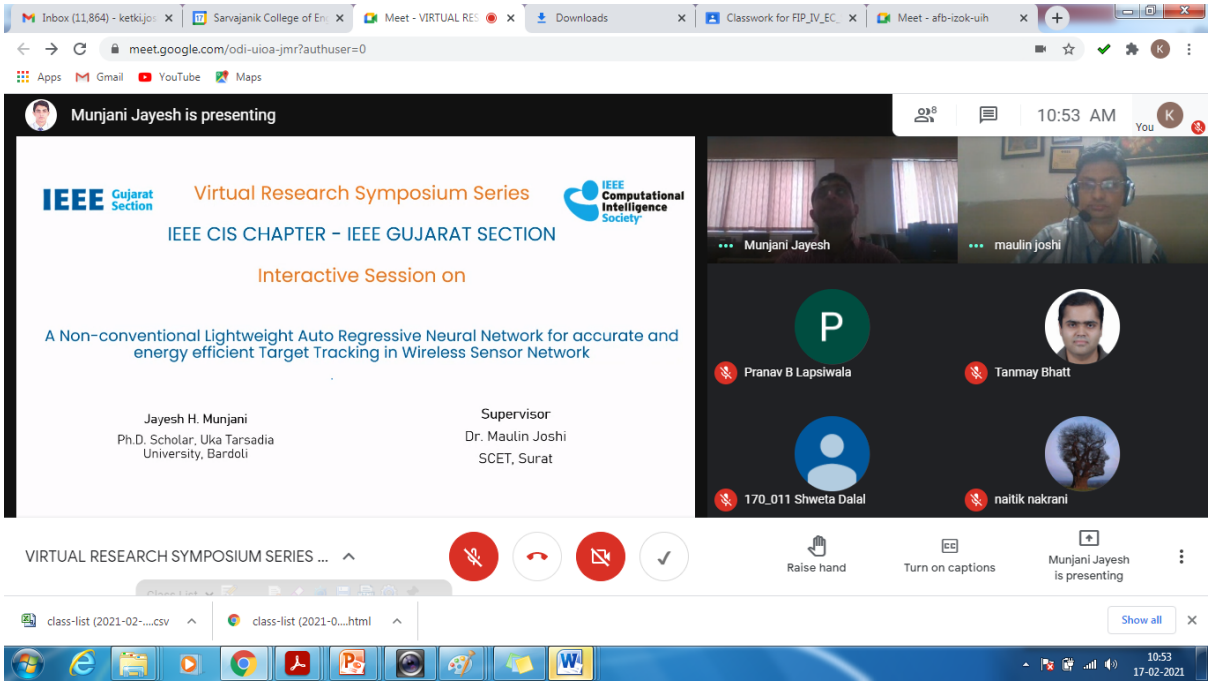
VIRTUAL RESEARCH SYMPOSIUM SERIES

CIS CHAPTER - IEEE GUJARAT SECTION

Topic : A non-conventional lightweight Auto Regressive Neural Network for accurate and energy efficient target tracking in Wireless Sensor Network

- **Venue:** Virtual Mode (locally hosted by SCET, Surat)
- **Date:** 17 Feb 2021
- **Speaker:** Mr Jayesh Munjani, PhD Scholar, Uka Tarsadia University, Bardoli, India
- **Supervisor:** Dr Maulin Joshi, Professor & Head, Electronics and Communication Engineering department, Sarvajanik College of Engineering &Technology, Surat
- **Audience:** 70+ (15 IEEE members , 55+ Non IEEE members)

Brief Summary: Jayesh Munjani briefly started with Introduction to WSN and target tracking. He explained motivation, challenges and research gap. He explained that the design of an energy-efficient tracking framework is a well-investigated issue and a prominent sensor network application. Current research state was presented that shows a clear scope for developing algorithms that can work, accompanying both energy efficiency and accuracy. The prediction-based algorithms were introduced as a solution that can save network energy by carefully selecting suitable nodes for continuous target tracking. Limitation of the conventional prediction algorithms that are confined to fixed motion models were shown and it was explained that such models generally fail in accelerated target movements. The neural networks can learn any non-linearity between input and output as they are model-free estimators. To design a lightweight neural network-based prediction algorithm for resource-constrained tiny sensor nodes is a challenging task. This research aims to develop a simpler, energy-efficient, and accurate network-based tracking scheme for linear and non-linear target movements. The proposed technique used an autoregressive model to learn the temporal correlation between successive samples of a target trajectory. The simulation results are compared with the traditional Kalman filter (KF), Interacting Multiple models (IMM), Current Statistical model (CSM), Long Short Term Memory (LSTM), Decision Tree (DT), and Random Forest (RF) based tracking approach. It shows that the proposed algorithm can save up to 70% of network energy with improved prediction accuracy.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10:53 AM
IEEE Gujarat Section
Virtual Research Symposium Series
IEEE Computational Intelligence Society
IEEE CIS CHAPTER - IEEE GUJARAT SECTION
Interactive Session on
A Non-conventional Lightweight Auto Regressive Neural Network for accurate and energy efficient Target Tracking in Wireless Sensor Network
Jayesh H. Munjani
Ph.D. Scholar, Uka Tarsadia University, Bardoli
Supervisor
Dr. Maulin Joshi
SCET, Surat
Munjani Jayesh
maulin joshi
Pranav B Lapsiwala
Tanmay Bhatt
170_011 Shweta Dalal
naitik nakrani
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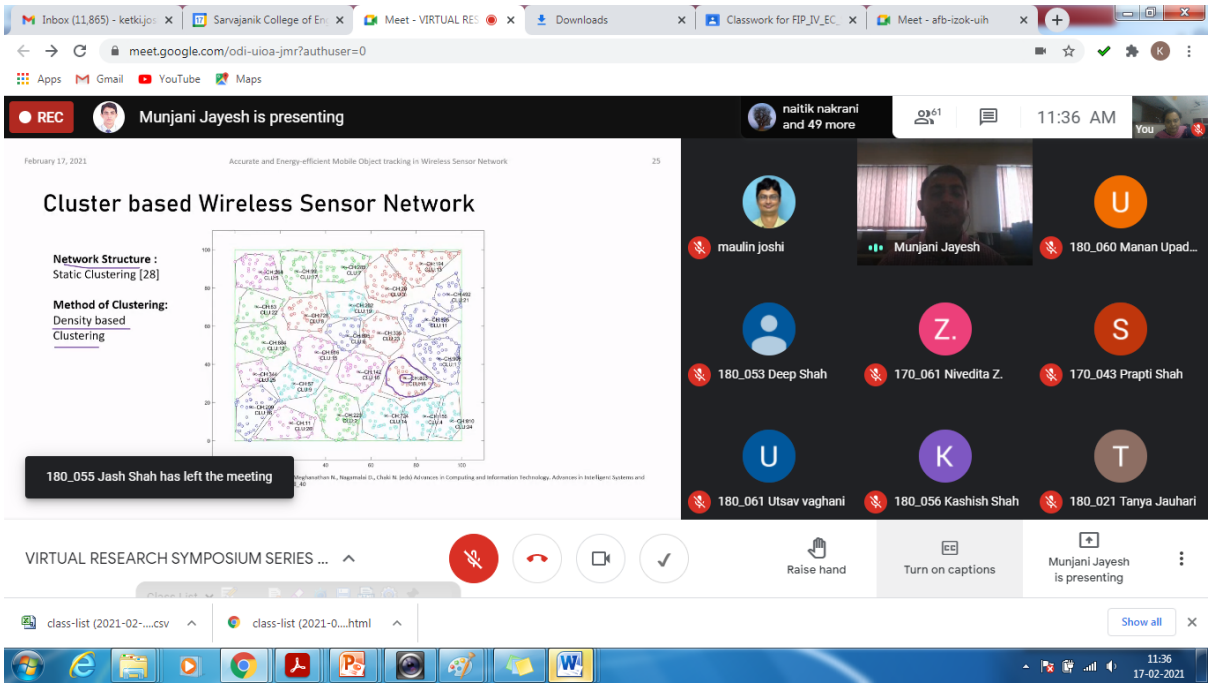
Munjani Jayesh is presenting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Munjani Jayesh is presenting
naitik nakrani and 49 more
11:36 AM
Cluster based Wireless Sensor Network
Network Structure :
Static Clustering [28]
Method of Clustering:
Density based Clustering
180_055 Jash Shah has left the meeting
maulin joshi
Munjani Jayesh
180_060 Manan Upad...
180_053 Deep Shah
170_061 Nivedita Z.
170_043 Prapti Shah
180_061 Utsav vaghani
180_056 Kashish Shah
180_021 Tanya Jauhari
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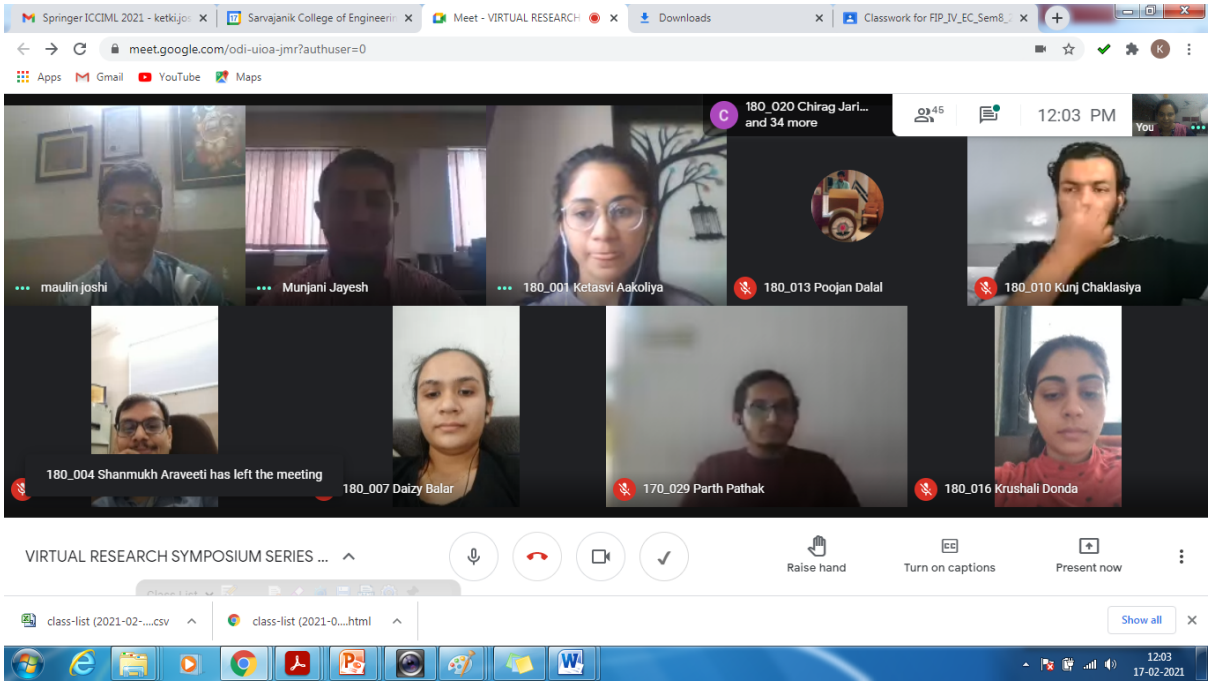
Munjani Jayesh is presenting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180_020 Chirag Jari... and 34 more
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Munjani Jayesh
180_001 Ketasvi Aakoliya
180_013 Poojan Dalal
180_010 Kunj Chaklasiya
180_004 Shanmukh Araveeti has left the meeting
180_007 Daizy Balar
170_029 Parth Pathak
180_016 Krushali Donda
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