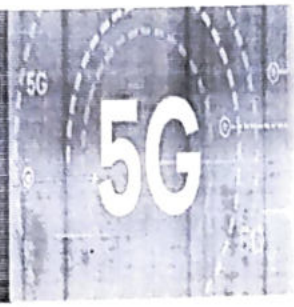
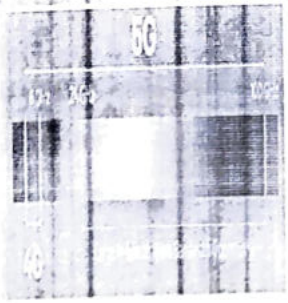
Organized by Prof. Aditya K. Jagannatham, EE Department, IIT Kanpur
PYTHON for 5G MU, Massive MIMO and mmWave MIMO
PYTHON for 5G NOMA, Cooperative and Cognitive Radio

IIT Kanpur Winter School on PYTHON for Design, Analysis and Simulation of 5G Technologies





Introduction

Welcome to the IIT Kanpur Winter School for advanced online Training Programs on **PYTHON for 5G Wireless Technology**. This is a unique cutting edge **Project based-** training school that will feature **intense PYTHON training modules** and **daily PYTHON projects** on the latest Multi-user, Massive MIMO, mmWave MIMO, NOMA, Cooperative, Cognitive Radio technologies, which form the pillars of 5G. Participants will be able to gain in-depth knowledge of PYTHON programming and practical hands-on experience of working on state-of-the-art **PYTHON-based 5G projects**. Python is an open-source, object-oriented and a highly efficient programming language for exceptionally fast and flexible implementation of 5G systems.

How does this program benefit YOU?
This training school can greatly benefit participants of all backgrounds as described below.
UG/ PG students: Learn *advanced scientific-programming in PYTHON* and **5G** technology for projects/ thesis and also conquer the job market!
Faculty members: Take your research to the next level with **PYTHON** and also *create student projects/ teaching/ research labs* based on **PYTHON** programming for 5G!
Industry and R&D personnel: Learn about *next generation 5G systems* and use our highly efficient open source **PYTHON modules to accelerate your implementations!**

Unleash the power of modern open source scientific computing in your career!
Experience our unique Project-based hands-on learning approach for leadership in 5G technology!

Important Dates

Course Dates

P1: 21th to 30th Dec

P2: 4th to 12th Jan

Last Date for Registration

P1: 14th Dec

P2: 28th Dec

Venue

To be conducted online via Zoom

Contact
Prof. Aditya K. Jagannatham
Professor
Arun Kumar Chair
Electrical Engineering
IIT Kanpur

E-mail

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About the Trainer

Prof. Aditya K. Jagannatham is a Professor in the Electrical Engineering department at IIT Kanpur, where he holds the Arun Kumar Chair Professorship, and is a well known expert and trainer on 5G technologies. He received his Bachelors degree from the Indian Institute of Technology, Bombay and M.S. and Ph.D. degrees from the University of California, San Diego, U.S.A. From April '07 to May '09 he was employed as a senior wireless systems engineer at Qualcomm Inc., San Diego, California, where he was a part of the Qualcomm CDMA technologies (QCT) division. His research interests are in the area of next-generation wireless networks, with special emphasis on various 5G technologies such as massive MIMO, mmWave MIMO, FBMC, NOMA, Full Duplex and others. He has published extensively in leading international journals and conferences. He has been recognized with several awards including the CAL(IT)2 fellowship at the University of California San Diego, Upendra Patel Achievement Award at Qualcomm, P.K. Kelkar Young Faculty Research Fellowship, Qualcomm Innovation Fellowship (QInF), Arun Kumar Chair and the IITK Excellence in Teaching Award.

Target Audience

- UG/ PG Students, PhD Scholars, Faculty and Professionals

For more details and registration information, visit the website
http://www.iitk.ac.in/mwn/python5G/

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Department:Electronics and Telematics Engineering

2020-21

REPORT

FDP on "Python for 5GMU, Massive MIMO and mm wave MIMO "

Date of program: 21st to 30th December, 2020

Resource person: Prof. Aditya K. Jagannatham

About the Program: The topics covered in this NPTEL course are:

1. Introduction and Key Specs of 5G Technologies
2. Overview of Sub 6GHz Multiple Antenna, MIMO and MU-MIMO Technologies
3. Signal Processing for MIMO Systems
4. Optimal Power Allocation and Precoding for MIMO
5. Introduction to 5G Massive MIMO Systems
6. Key Features of Massive MIMO and Advantages over Point-to-Point and MU-MIMO
7. Signal Processing Operations for Massive MIMO in UL and DL
8. Massive MIMO Channel Model– Large/ Small Scale Fading
9. Properties of Random Vectors and Massive MIMO Analysis
10. Analysis of Spectral Efficiency in Massive MIMO Systems and Power Scaling
11. Hybrid RF/ BB Precoder and Combiner Design for mmWave MIMO
12. Hybrid Transceiver Architectures for mmWave MIMO

The Faculty Development Program on Python for 5GMU, Massive MIMO, and mmWave MIMO proved to be a valuable initiative in enhancing the skills and knowledge of faculty members. The program's success can be attributed to the dedicated efforts of the resource persons, active participation of the faculty, and the well-structured curriculum.

M vijaya

Dr.M.Vijayalakshmi

Assistant professor

ETE

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