

# PALLAV KUMAR DEB

(+91)8436942458  $\diamond$  pallv.deb@gmail.com  $\diamond$  pallv.deb@iitkgp.ac.in

SWAN Lab, Dept. of Computer Science and Engineering

Indian Institute of Technology, Kharagpur 721302

## EDUCATION

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**Indian Institute of Technology, Kharagpur**

*August 2017 - Present*

Doctor of Philosophy

Department of Computer Science & Engineering

**Tezpur University**

*August 2015 - August 2017*

Master of Technology

CGPA: 9.2

Information Technology

**Royal Group of Institutes, Gauhati University**

*August 2010 - August 2014*

Bachelor of Engineering

Overall Percentage: 74.39

Department of Computer Science & Engineering

## RESEARCH INTERESTS

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Networking, resource allocation, fog computing, constrained devices, AI/ML-based solutions, Internet of Things, UAVs, Swarm of UAVs, e-health, THz communications, nano-networks.

## WORK EXPERIENCE

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**SensorDrops Networks Pvt. Ltd., Kharagpur**

Dec 2018 – Present

*R&D Consultant*

- Developed multiple Internet of Things (IoT) devices dedicated towards addressing basic societal as well as industrial needs.
- Developed multiple Android applications for interacting with the IoT devices and also for other activities, such as sensing and actuating.
- Worked closely with the founders during the creation of SensorDrops Networks Pvt. Ltd.

**Indian Institute of Technology, Kharagpur**

Jun 2017 – Present

*Teaching Assistant*

- Programming and Data Structures Lab
- Software Engineering
- Architecture and Protocols for Internet of Things

**Tezpur University**

Jun 2015 – Jun 2017

*Teaching Assistant*

- Information and Communication Technology
- Introductory Computing
- Computer Graphics
- Computer Organization and Architecture

**West Coast Frozen Foods Pvt. Ltd., Mumbai**

Jul 2014 – Dec 2014

*In-house Software Developer*

- Assisted in creation of websites.
- Developed smart inventory system for incoming and outgoing packages.

## WORK VISITS

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### **Tata Consultancy Services, Innovation Laboratory** *Kolkata*

Demonstration of IoT-based wireless temperature sensing nodes from SensorDrops Networks Pvt. Ltd.

### **Calcutta Electric Supply Corporation Limited** *Kolkata*

Demonstration of IoT-based wireless condition monitoring nodes from SensorDrops Networks Pvt. Ltd.

### **Ceratizit Limited** *Uluberia, West Bengal*

Discussion for Industrial IoT and Industry 4.0 from SensorDrops Networks Pvt. Ltd.

## PROJECTS

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### **B.E.: Steganography**

In this work, we take textual input from the user, which we convert to a picture of any format. We then use the least significant bit (LSB) routines for hiding the picture containing the textual data into another arbitrary picture. We then forward the superimposed image to designated receivers. On the receiving side, we provide routines for separating the images from one another. My team of 2 other members prepared this project towards the completion of our Bachelor of Engineering degree.

### **M.Tech: Human Activity Recognition from Video**

This project lists the series of activities performed by people in a video. It consists of three steps – 1) Recognition of humans and objects in a video frame, 2) Identify nature of movement based on joint movements and angles, and 3) Finalize activity based on the objects that the human is using. This work involves the use of machine learning routines like Convolution Neural Network (CNN) and Hidden Markov Models (HMM). I prepared this project towards the completion of my Masters of Technology degree.

### **SkopEdge: A Smart Digital Stethoscope**

2019 – Present

In this work, we developed a low-cost and easy-to-use digital stethoscope that records heart sounds and automatically counts the number of heartbeats. Due to changing network conditions, the stethoscope changes the quality of the audio files and sends it to remote locations. The results are then made available for analysis by remote doctors along with a visualization for the same. This work has been recently accepted for presentation at the IEEE International Conference on Communications (ICC) 2020, in Dublin, Ireland.

## TECHNICAL STRENGTHS

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<b>Programming</b>	C/C++, Java, Python, Android, HTML/PHP, Matlab
<b>Tools</b>	Tensorflow, OpenCV, Keras, and other machine learning frameworks
<b>Software &amp; Tools</b>	MS Office, Latex, Docker

## PROFESSIONAL AFFILIATIONS

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<b>2020 - Present</b>	IEEE, Graduate Student Member
<b>2020 - Present</b>	IEEE Communications Society (ComSoc), Student Member

## TEACHING ASSISTANTSHIPS

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**National Programme on Technology Enhanced Learning (NPTEL)** 2020 – Present

- Introduction to Internet of Things

**Indian Institute of Technology, Kharagpur** 2017 – Present

- Introduction to Internet of Things
- Cloud Computing
- Software Engineering
- Programming and Data Structures Lab

**Tezpur University** Jun 2015 – Jun 2017

- Information and Communication Technology
- Introductory Computing
- Computer Graphics
- Computer Organization and Architecture

## WORKSHOPS AND TALKS

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**SGRIP-Sponsored Short Term Course on Modern Wireless Networks and IoT** October 2019

*IIT Kharagpur*

Hands-on Session on IoT devices and Android programming.

**Guest Lecture: Online Mode** June 2020

*Jorhat Engineering College*

Invited talk on *Introduction to Fog Computing*.

## PUBLICATIONS

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### JOURNALS

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1. S. Misra, S. P. Rachuri, **P. K. Deb** and A. Mukherjee, "Multi-Armed Bandit-based Decentralized Computation Offloading in Fog-Enabled IoT," in *IEEE Internet of Things Journal*, doi: 10.1109/JIOT.2020.3048365.
2. **P. K. Deb**, S. Misra, T. Sarkar and A. Mukherjee, "Magnum: A Distributed Framework for Enabling Transfer Learning in B5G-Enabled Industrial-IoT," in *IEEE Transactions on Industrial Informatics*, doi: 10.1109/TII.2020.3047206.
3. R. Saha, S. Misra and **P. K. Deb**, "FogFL: Fog Assisted Federated Learning for Resource-Constrained IoT Devices," in *IEEE Internet of Things Journal*, doi: 10.1109/JIOT.2020.3046509.
4. **P. K. Deb**, C. Roy, A. Roy and S. Misra, "DEFT: Decentralized Multiuser Computation Offloading in a Fog-Enabled IoV Environment", in *IEEE Transactions on Vehicular Technology*, doi: 10.1109/TVT.2020.3039514.
5. S. Misra, **P. K. Deb**, N. Koppala, A. Mukherjee and S. Mao, "S-Nav: Safety-Aware IoT Navigation Tool for Avoiding COVID-19 Hotspots", in *IEEE Internet of Things Journal*, doi: 10.1109/JIOT.2020.3037641.

## CONFERENCES

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1. S. Misra, **P. K. Deb**, N. Pathak, A. Mukherjee, "Blockchain-Enabled SDN for Securing Fog-Based Resource-Constrained IoT", *IEEE INFOCOM Workshop*, Toronto, Canada, July 6-9 2020.
2. **P. K. Deb**, S. Misra, A. Mukherjee, A. Jamalipour, "SkopEdge: A Traffic-Aware Edge-Based Remote Auscultation Monitor", *IEEE International Conference on Communications (ICC)* 2020, Dublin, Ireland, June 7-11, 2020.

## BOOK CHAPTERS

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1. **P. K. Deb**, S. Misra, A. Mukherjee, A. Bandyopadhyay, "Containing the Spread of COVID-19 with IoT: A Visual Tracing Approach", **Computational Modelling and Data Analysis in COVID-19 Research**, CRC Press, USA.

## ACADEMIC ACHIEVEMENTS

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1. Secured national rank in GATE 2015 for securing admission into M.Tech.
2. Received a *Honorary Mention* in the 2020 IEEE Communications Society Student Project Competition "*Communications Technology Changing the World*".

## ACADEMIC REFEREE SERVICE

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IEEE	IEEE Transactions on Vehicular Technology
IEEE	IEEE Transactions on Mobile Computing
IEEE	IEEE Transactions on Industrial Informatics
IEEE	IEEE Internet of Things Journal
IEEE	IEEE Systems Journal
IEEE	IEEE Journal on Selected Areas of Communications
IEEE	IEEE Internet of Things Magazine
IEEE	IEEE International Conference on Communications
IEEE	IEEE International IOT, Electronics, and Mechatronics Conference

## EXTRA-CIRRICULAR

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Co-Organized Counter Strike 2013 - a gaming event in Royal Group of Institutions.

Ranked 1660 in NIIT 8<sup>th</sup> national aptitude test.

Secured second position in movie making competition 2015 at Tezpur University.

Secured first position in movie making competition 2016 at Tezpur University.

## PERSONAL TRAITS

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Highly motivated and eager to learn new things.

Strong motivational and leadership skills.

Ability to work as an individual as well as in group.

## REFERENCES

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**Prof. Sudip Misra**

Professor  
Dept. of Computer Science and Engineering  
IIT Kharagpur  
Email: smisra@cse.iitkgp.ac.in, smisra.editor@gmail.com

**Dr. Anandarup Mukherjee**

Research Assistant  
Dept. of Engineering  
University of Cambridge, U.K.  
Email: am2910@cam.ac.uk

**Dr. Shobhanjana Kalita**

Assistant Professor  
Dept. of Computer Science and Engineering  
Tezpur University  
Email: kalitas@tezu.ernet.in

**Dr. Arindam Karmakar**

Assistant Professor  
Dept. of Computer Science and Engineering  
Tezpur University  
Email: arindam@tezu.ernet.in