Jishnu Dey

Phone: +91 98444 95510, +91 99325 82410
email: jishnudey.kgp@gmail.com
web: jishnu-d.github.io

Research Interests

Machine Learning, Data Science, Health Data Science, Artificial Intelligence

Academic Information

2016 | Bachelor of Technology (Hons.) in Electronics and Electrical Communication Engineering
Cumulative GPA: 9.36/10 | **Indian Institute of Technology, Kharagpur**

2012 | All India Senior School Certificate Examination
Percentage: 93.4% | **Central Board of Secondary Education**

2010 | All India Secondary School Examination
Cumulative GPA: 10/10 | **Central Board of Secondary Education**

R&D Work Experience

Software Engineer at Samsung R&D Institute India, Bangalore — June 2016 - Present
Advanced Technologies Lab - *Connected Health and Fitness*

- Working on design and implementation of signal processing and machine learning algorithms applied to health and fitness tracking.
- Worked with photoplethysmographic (PPG) sensors for estimation of various psycho-physiological parameters such as alertness, stress, endurance through heart rate variability (HRV).
- Involved with acquisition of noisy PPG signals from the wrist or the fingertip, extraction of relevant features, and prediction using machine learning models, trained through publicly available/in-house datasets.
- Published two papers in IEEE EMBC 2017; Ongoing development of three mobile/wearable applications encompassing these algorithms.

List of Publications

- **Jishnu Dey**, Tanmoy Bhowmik, Saswata Sahoo, Vijay Narayan Tiwari. "Wearable PPG sensor based alertness scoring system." 2017 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC). Year: 2017. Pages: 2422 - 2425. [Link]

- Tanmoy Bhowmik, **Jishnu Dey**, Vijay Narayan Tiwari. "A novel method for accurate estimation of HRV from smartwatch PPG signals." 2017 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC). Year: 2017. Pages: 109 - 112. [Link]

Internships & Projects

Aug 2015 - Apr 2016 | *Distributed Deployment of Wireless Sensor Networks*
Bachelor's Thesis - Advisor: Prof. Rajarshi Roy

- Problem statement of distributed deployment of sensors in a field with limited communication between peer sensor nodes. Aimed to achieve maximum coverage of a target area while keeping the sensors interconnected.
- Formulated the problem into a global potential function which was decomposed into local cost functions for all the self interested sensors.
- Distributed optimization was implemented for each of the self interested agents to determine optimal sensor locations, resulting in maximum coverage.
- Awarded 10 out of 10 grade points by the evaluation committee over two semesters.

May - Jul 2015 | *Heart Rate estimation from noisy Photoplethysmographic (PPG) signals*
Summer Intern at Samsung R&D Institute India, Bangalore

- Objective was to estimate heart rate from noisy PPG signals along with accelerometer data as a proxy for motion.
- Adaptive filters were used which aimed at estimating the noise component in the PPG signal based on the reference accelerometer motion.
- Tested on public dataset of IEEE Signal Processing Cup 2015 as well as in-house data with excellent results.
- Offered a full-time job offer in the organization in the healthcare research division.

May - Jun 2014 | *Modeling and Simulation of interaction between nanopropellers*
Research Intern at Centre for Nanoscience and Engineering (CeNSE), IISc Bangalore
Advisor: Prof. Ambarish Ghosh

- Performed a MATLAB simulation of the interaction between two nanopropellers in a given field, and eventual synchronization.
- Involved the modeling of their mutual potential based on the external as well as internal forces in the system.
- Results of the simulation were in line with the experimental observations.

Test Scores and Other Awards

- Samsung Citizen Award: Technology Excellence - Category: **Innovator** - awarded in Aug 2017
- GRE General Test [Taken July 2017]: **334** [Verbal - **164**, Quantitative - **170**, AWA - **4.0**]
- TOEFL iBT [Taken September 2017]: **113** [Reading - **30**, Listening - **27**, Speaking - **27**, Writing - **29**]
- Awarded scholarship by CeNSE, **Indian Institute of Science, Bangalore** to undergo the summer research program.
- IIT-JEE 2012: In the top **0.1%** candidates among 0.5 million applicants.
- **Gold Medalist** in Maths Olympiad, Technology General Championship 2013, IIT Kharagpur.
- Qualified for the Indian National Math Olympiad in 2010 & 2011.

Programming Languages and Tools

General Purpose Languages	C, C++, Java, Python
Scientific Languages and Tools	Python libraries - [scikit-learn, TensorFlow, Keras, Pandas, SciPy], MATLAB [and Octave], R
Markup and Typesetting	LaTeX, HTML & CSS
Application Development	Android

Major Courses

Machine Learning
Machine Intelligence and Expert Systems
Probability and Stochastic Processes
Communication Networks and Optimization
Advanced Operating Systems Design
Matrix Algebra
Science of Living System
Digital Image Processing
Digital Signal Processing
Design and Analysis of Algorithms
Programming and Data Structures
Information Theory and Coding
Computer Communication and Networking
Digital Communication