

# Jishnu DEY

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## RESEARCH INTERESTS

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Machine Learning, Artificial Intelligence, Computer Vision, Healthcare Analytics

## ACADEMIC INFORMATION

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| 2016 | Bachelor of Technology (Hons.) in ELECTRONICS AND ELECTRICAL COMMUNICATION ENGINEERING<br>CUMULATIVE GPA: 9.36/10   <b>Indian Institute of Technology, Kharagpur</b> |
| 2012 | All India Senior School Certificate Examination<br>PERCENTAGE: 93.4%   <b>Central Board of Secondary Education</b>   |
| 2010 | All India Secondary School Examination<br>CUMULATIVE GPA: 10/10   <b>Central Board of Secondary Education</b>  |

## R&D WORK EXPERIENCE

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| JUN 2016 - PRESENT | <b>Software Engineer at SAMSUNG R&amp;D INSTITUTE INDIA, Bangalore</b><br><b>ADVANCED TECHNOLOGIES LAB - <i>Connected Health and Fitness</i></b><br>Primarily, I am concerned with the design and implementation of various algorithms related to health and fitness tracking. So far I have worked with photoplethysmographic (PPG) sensors for estimation of various psycho-physiological parameters. These involve acquisition of noisy PPG signals from the wrist or the fingertip, extraction of relevant features, and prediction using machine learning models, which are trained through either publicly available datasets or in-house datasets. My work has led to two publications in IEEE EMBC 2017, and development of three mobile/wearable applications with these algorithms in the background. |
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## LIST OF PUBLICATIONS

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**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

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| AUG 2015 - APR 2016 | <b><i>Distributed Deployment of Wireless Sensor Networks</i></b><br><b>BACHELOR'S THESIS - ADVISOR: Prof. Rajarshi Roy</b><br>In this project, I attempted the problem of distributed deployment of sensors in a field where there is limited communication between peer sensor nodes. One of the subproblems was maximum coverage of a target area while keeping the sensors interconnected. The problem was formulated into a potential function which was minimized using distributed optimization by all the self interested sensors. Another subproblem was achieving coverage of several points of interest in a given field and communicating to a base station. In this case, the approach was to connect the sensors in an imaginary relative neighbourhood graph while every sensor was self-interested in the coverage. I was graded 10/10 for my efforts. |
| MAY - JUL 2015      | <b><i>Heart Rate estimation from noisy Photoplethysmographic (PPG) signals</i></b><br><b>Summer Intern at SAMSUNG R&amp;D INSTITUTE INDIA, Bangalore</b><br>In this internship, my 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. The algorithm was tested on public dataset of IEEE Signal Processing Cup 2015 as well as in-house data with good results. My work led to a full-time job offer in the organization in the 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

In this internship, I performed a MATLAB simulation of the process through which two nanopropellers would interact in a given field, and synchronise through minimization of their mutual potential. This also involved the modelling of their mutual potential based on the external as well as internal forces in the system. The results of the simulation was in line with the experimental observations.

## TEST SCORES AND OTHER AWARDS

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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**]

SAMSUNG CITIZEN AWARD: Technology Excellence - **Category**: Innovator - awarded in Aug 2017

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.

## PROGRAMMING LANGUAGES AND TOOLS

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GENERAL PURPOSE LANGUAGES	C, C++, JAVA, PYTHON
SCIENTIFIC LANGUAGES AND TOOLS	MATLAB [AND OCTAVE], R, PYTHON PACKAGES - [NUMPY, MATPLOTLIB, SCIKIT-LEARN, TENSORFLOW, KERAS]
MARKUP AND TYPESETTING	L <sup>A</sup> T <sub>E</sub> X, HTML CSS

## RELEVANT COURSES

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MACHINE LEARNING	Grade: <b>10/10</b>	DIGITAL IMAGE PROCESSING	Grade: <b>10/10</b>
MACHINE INTELLIGENCE AND EXPERT SYSTEMS	Grade: <b>9/10</b>	DIGITAL SIGNAL PROCESSING	Grade: <b>10/10</b>
PROBABILITY AND STOCHASTIC PROCESSES	Grade: <b>10/10</b>	DESIGN AND ANALYSIS OF ALGORITHMS	Grade: <b>9/10</b>
COMMUNICATION NETWORKS AND OPTIMIZATION	Grade: <b>9/10</b>	PROGRAMMING AND DATA STRUCTURES	Grade: <b>9/10</b>
ADVANCED OPERATING SYSTEMS DESIGN	Grade: <b>10/10</b>	INFORMATION THEORY AND CODING	Grade: <b>9/10</b>
MATRIX ALGEBRA	Grade: <b>10/10</b>		