

# SUBHAMOY BISWAS

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## ■ Education

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July 2018 -  
present

### **Bachelor of Engineering (B.E.) (Honours)**

■ *Jadavpur University, India | Field: Electrical Engineering | Average GPA: 9.1/10*

- Specialization: Advanced Instrumentation
- Relevant courses: Signals & Systems, Control systems, Instrumentation, Communications, Machines, Field theory, Mathematics, Statistics, Machine learning, Numerical computing
- *Capstone project:*
  - ✓ Classification of prosthetic hand finger gestures from electromyogram (EMG) signals – [Brief report](#)

## ■ Research Experience

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August 2019  
- present

### **Undergraduate Research Assistant**

■ *Center for Interdisciplinary Research and Education (CIRE), Kolkata, India*

- Aim: *Computer-assisted peptide vaccine design for different viruses*
  - ✓ Worked on alignment-free algorithms to numerically represent mutations in viral proteins
  - ✓ Proposed a novel mathematical model that studies the characteristics of the surface glycoprotein to predict vaccine candidates
  - ✓ Developed an open-access Python application to implement this design
- Guides: Prof. Subhash C. Basak (University of Minnesota Duluth); Dr. Ashesh Nandy (CIRE)
- *Related links:* [Work outcomes](#) | [Software access](#)

June 2021 -  
August 2021

### **Undergraduate Research Assistant – MITACS Globalink program**

■ *Department of Pharmacology and Physiology, University of Montreal (UdeM), Canada*

- Aim: *Simulation of atrial fibrillation (A-fib) in a computer model of the heart*
  - ✓ Scripted a Python code to map the action potentials of the heart on a computational model
  - ✓ Applied similarity-based algorithms to find the inconsistent activations on the model
  - ✓ Examined their spatio-temporal properties using statistical approaches
- Guide: Prof. Vincent Jacquemet (UdeM)
- *Related link:* [Software access](#)

June 2020 -  
August 2020

### **Research Intern**

■ *Department of Industrial and Systems Engineering, Indian Institute of Technology, Kharagpur*

- Aim: *Decision support tool for comorbidity healthcare planning for COVID 19*
  - ✓ Developed time series and regression models using R to predict how many emergency hospital facilities must be allocated to accommodate COVID affected comorbid patients
- Guides: Prof. Goutam Sen and Prof. Sayak Roychowdhury (IIT Kharagpur)
- *Related links:* [Work summary](#) | [Video demonstration](#)

## ■ Industrial Experience

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May 2021 - Technology Consulting Intern

July 2021

■ PricewaterhouseCoopers (PwC), India | Line of service: Advisory

- Aim: *Customer Relationship Management (CRM) system using Microsoft Dynamics 365*
  - ✓ Built cloud automated flows for omnichannel integration of communication media in CRM
  - ✓ Drafted its user and knowledge articles and defined its business units and security roles

## ■ Skills and Techniques

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- *Languages:* Python, C, R, MATLAB
- *Bioinformatics tools:* PyMOL, MEGA, IEDB
- *Electrical automation and prototyping:* OrCAD  
PSPice, Proteus, Arduino
- *Computational techniques:* data science, omics data analysis, computer-aided simulation
- *Engineering design:* AutoCAD
- *Other skills:* Microsoft Dynamics 365

## ■ Publications

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- Peer-reviewed journal articles
- 2021 **Biswas S**, Manna S, Nandy A, Basak S. “*New Computational Approach for Peptide Vaccine Design against SARS-COV-2*”. International Journal of Peptide Research & Therapeutics, Springer [ [DOI](#) ]
- Biswas S**, Manna S, Dey T, Chatterjee S, Basak SC. “*Identification of Generalized Peptide Regions for Designing Vaccine Effective for All Significant Mutated Strains of SARS-CoV-2*”. Combinatorial Chemistry & High Throughput Screening, Bentham Science [ [DOI](#) ]
- 2020 Manna S, Dey S, **Biswas S**, Nandy A, Basak SC. “*Current Perspective of Zika Virus and Vaccine Development*”. Exploratory Research and Hypothesis in Medicine, Xia & He [ [DOI](#) ]
- Conference articles
- 2020 **Biswas S**, Dey T, Chatterjee S, Manna S, Nandy A, Das S, Nandy P, Basak SC. “*Novel Algorithms for In Silico Peptide Vaccine Design with Reference to Ebola Virus*”. IEEE International Conference on Computer, Electrical & Communication Engineering [ [DOI](#) ]
- Dey T, **Biswas S**, Chatterjee S, Manna S, Nandy A, Basak SC. “*2D Polar Co-ordinate Representation of Amino Acid Sequences with some Applications to Ebola virus, SARS and SARS-CoV-2 (COVID-19)*”. MDPI MOL2NET-06, UMN Duluth [ [DOI](#) ]
- Biswas S**, Chatterjee S, Dey T, Dey S, Manna S, Nandy A, Basak SC. “*In Silico Approach for Peptide Vaccine Design for CoVID 19*”. MDPI MOL2NET-06, UMN Duluth, [ [DOI](#) ]
- 2019 **Biswas S**, Chatterjee S, Dey T, Manna S, Nandy A, Das S, Nandy P, Basak SC. “*A Novel Approach to Peptide Vaccine Design for Ebola Virus*”. MDPI MOL2NET-05 [ [DOI](#) ]
- Under review **Biswas S**, Chatterjee S, Dey S, Nandy A. “*Combatting future variants of SARS-CoV-2 using an in-silico peptide vaccine approach by targeting the spike protein*”. Medical Hypotheses, Elsevier
- Submitted Saliani A, **Biswas S**, Jacquemet V. “*Simulation of atrial fibrillation in a non-ohmic propagation model with dynamic gap junctions*”, Chaos, American Institute of Physics

## ■ Peer Review Activities

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November      **Spectrum Journal**

2021 - present      ■ *University of Alberta Library, Canada* | ISSN: [2561-7842](#)

- Selected as a reviewer for articles in “biomedical engineering” and “computing science” fields

## ■ Conference Presentations and Seminars

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December      **Global Institute of Pharmaceutical Education and Research, India**

2021      ■ *International Symposium on Drug Design and Development Research (DDDR)*

- Described my work on characterization of DNA, RNA and protein sequences using novel algorithms to find vaccine targets in emerging pathogens [ [symposium talk](#) ]

January 2020      **Techno India University, India**

■ *IEEE International Conference on Computer, Electrical & Communication Engineering*

- Demonstrated my paper on how immunoinformatic approaches can help in deriving novel vaccine targets for the Zaire Ebola virus [ [presentation](#) ]

September      **Department of Physics, Jadavpur University, India**

2019      ■ *Impromptu Seminar on Discrete Mathematical Modelling in Physics, Chemistry and Biology with Applications in Emerging Fields*

- Pitched my methodology behind vaccine design for the Zaire Ebola virus [ [seminar talk](#) ]

## ■ Awards and Scholarships

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April 2021      Got the [MITACS Globalink Research Internship Award](#) – the program had an acceptance rate “<10%”

December      Received the [Gold Honour](#) in the *International Youth Math Challenge (IYMC)* for ranking among the  
2020      “top 2%” after three rounds of problem-solving in mathematics

September      Participated in a group of 5 and became one of the [pre-finalists](#) in the *Flipkart Grid 2.0 Robotics*  
2020      *Challenge*, after being among the “top 34 out of 6000+” registered candidates for designing and  
simulating an automatic staircase climbing robot

December      Awarded the merit-based [Jagadis Bose National Science Talent Search Senior Scholarship](#) for  
2018      being among the “top 73 out of 2000+” undergraduate applicants in West Bengal, India – selected  
from a three-level competition in natural sciences and mathematics

## ■ Professional Certifications

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December      Completed the “[Deep Learning with TensorFlow](#)” online training under *Computer-Aided Design*  
2020      *Centre, Jadavpur University*, with a grade of “A+” and a score of “97%” in the final evaluation

November      Completed the training programme “[Applied Statistics for Engineers and Researchers](#)”, conducted by  
2020      the *Department of Civil Engineering, Visvesvaraya National Institute of Technology, Nagpur*

May 2020      Completed the “[PH125.1X: Data Science: R Basics](#)” course offered by *Harvard University* from *edX*

■ Professional Memberships

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September	<b>Student Member</b>
2018 - present	<div>■ <i>Institute of Engineering and Technology (IET) (UK): On-Campus Jadavpur University Chapter</i><ul style="list-style-type: none"><li>Volunteered techno-management events organized by IET in Jadavpur University</li></ul></div>