

# Koushik Roy

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Google Scholar: [scholar.google.com/citations?user=K0VYprUAAAAJ](https://scholar.google.com/citations?user=K0VYprUAAAAJ)

## Research Interests

ML for Systems, ML for Software Engineering, Software Systems, Distributed Systems

## Education

**Columbia University in the City of New York, New York, NY**

Sep 2021 – Feb 2023

MS, Computer Science

Thesis title: Geometry-aware Architectures for Inverse Protein Folding using AlphaFold2

Advisor: [Mohammed AlQuraishi](#)

GPA: 3.60/4.0

**North South University, Dhaka, Bangladesh**

Sep 2015 – Dec 2019

BS, Computer Science & Engineering

Advisor: [Nabeel Mohammed](#)

GPA: 3.53/4.0 (*cum-laude distinction*)

## Experience

**Elementary Robotics Inc., Pasadena, CA**

Jan 2023 – Jun 2024

Software Engineer

Software Engineering Team for Edge Computing

**Columbia University in the City of New York, New York, NY**

Jan 2022 – Dec 2022

Graduate Teaching Assistant

Classes Taught: Applied Deep Learning (Prof. Joshua B. Gordon),  
Computer Systems for Data Science (Prof. Asaf Cidon)

**Columbia University in the City of New York, New York, NY**

Sep 2021 – Dec 2022

Research Assistant for MS Thesis

Supervised by Prof. AlQuraishi & Nazim Bouatta

**North South University, Dhaka, Bangladesh**

Jan 2021 – Aug 2021

Research Assistant (Apurba – NSU R&D Lab)

Supervised by Prof. Nabeel Mohammed

## Publications

### **A multifaceted evaluation of representation of graphemes for practically effective Bangla OCR**

**Koushik Roy**, M S Hossain, P K Saha, S Rohan, I Ashrafi, I M Rezwan, F Rahman, BM M Hossain, A Kabir, N Mohammed

International Journal on Document Analysis and Recognition (**IJDAR**), 2023

### **Single-sequence protein structure prediction using a language model and deep learning**

R Chowdhury\*, N Bouatta\*, S Biswas\*, C Floristean\*, A Kharkar, **Koushik Roy**, C Rochereau, G Ahdriz, J Zhang, G M Church, P K Sorger, M AlQuraishi

**Nature Biotechnology**, 2022 [IF: 68.16] (featured on the cover of the journal as well)

### **Analysis of Bangla Keyboard Layouts Based on Keystroke Dynamics, Intelligent Systems and Sustainable Computing**

S Rohan, **Koushik Roy**, P K Saha, S Hossain, F Rahman, N Mohammed

Intelligent Systems and Sustainable Computing: Proceedings of **ICISSC**, 2022

### **MHASAN: Multi-Head Angular Self Attention Network for Spoof Detection**

M Hasan\*, **Koushik Roy\***, L Rupty, M Hossain, S Sengupta, S N Taus, N Mohammed

International Conference on Pattern Recognition (**ICPR**), 2022

### **Bi-FPNFAS: Bi-directional feature pyramid network for pixel-wise face anti-spoofing by leveraging fourier spectra**

**Koushik Roy**, M Hasan, L Rupty, M Hossain, S Sengupta, S N Taus, N Mohammed

**Sensors**, 2021

### **A-DeepPixBis: Attentional angular margin for face anti-spoofing**

M S Hossain, L Rupty, **Koushik Roy**, M Hasan, S Sengupta, N Mohammed

International Conference on Digital Image Computing: Techniques and Applications (**DICTA**), 2021

### **An analytical approach for enhancing the automatic detection and recognition of skewed bangla license plates**

**Koushik Roy**, A M S Khan, M Ali, S R Simanto, N Mohammed, M Atick, S Islam, M Islam

International Conference on Bangla Speech and Language Processing (**ICBSLP**), 2019

## **A Traffic Jam Prediction Model for dynamic routes using Global Positioning Systems Data from Vehicles at Different Times of the Day**

**Koushik Roy**, A A Iman, N Islam, A Firoze

International Symposium on Advanced Intelligent Systems (ISIS), 2018

## **Selected Press Coverage**

### **A language model beats alphafold2 on orphans**

by Jennifer M. Michaud, Ali Madani & James S. Fraser, 2022

## **Technical Skills**

Languages Python, C++, C, Java, JavaScript, SQL

Frameworks PyTorch, TensorFlow, Spark, Flask, Express.js, React, Redux

Other Tools JIRA, Git, CircleCI, Docker, MongoDB, MySQL, AWS, GCP

## **Achievements**

### **Article Featured on the cover of Nature Biotechnology Journal (Impact Factor: 68.16)**

Link to the cover: [nature.com/nbt/volumes/40/issues/11](https://www.nature.com/nbt/volumes/40/issues/11)

### **Champion at Technovation Data Science Hackathon 2019**

organized by [NSU ACM Student Chapter](#)

### **Runners-up at Grameenphone API Hackathon 2019**

organized by [Telenor Group](#)

### **Ranked 2nd at Intra NSU Programming Contest 2018**

organized by the [Dept. of Computer Science, NSU](#); Ranklist [link](#).

### **ACM ICPC Regionals (2015-2019)**

organized by various universities; ICPC Profile [link](#).