

# ZAFAR AHMAD

27 Cedar Drive, Stony Brook, NY 11790  
(+1) 631 746 7598 ◊ zafahmad@cs.stonybrook.edu

## EDUCATION

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### **Stony Brook University (SUNY-SB)**

PhD Candidate in Computer Science

Advisor: **Rezaul A. Chowdhury**

Expected Graduation: **Fall 2022**

Graduate Courses: Machine Learning, Data Science Fundamentals, Artificial Intelligence, Computational Biology, Analysis of Algorithms, Fundament of Computer Networks, Optimization Techniques in Biomolecular Simulations.

Stony Brook, NY

August 2016 - Present

Overall GPA: 3.88/4

### **Shahjalal University of Science and Technology**

B. Sc. in Computer Science & Engineering

Merit Position: **1<sup>st</sup>** (Out of 122 students)

Thesis: *Deep-eANN*: Identification of novel microRNAs from expression data in virus & animal genomes.

Sylhet, Bangladesh

November 2008 - May 2013

Overall GPA: 3.74/4

## WORK EXPERIENCE

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### **Research Assistant**

TEALab @ SUNY-SB

May 2017 - Present

Stony Brook, NY

- Improved victim selection policies for work stealing scheduler.
- Automated high-performance parallel code generation from problem's high-level description.
- Space parallelism trade-off for cache efficient Divide-and-Conquer Algorithms.
- Toward Efficient Architecture-Independent Algorithms for Dynamic Programs.

### **Data Analytics Specialist - National Data Analytics Task-Force**

Ministry of ICT, Bangladesh

July 2020 - Present

Remote Collaboration

- Communication with the Health and ICT Ministry of Bangladesh and recommend policies for COVID-19 pandemic based on the evidence data.

### **National Consultant**

UNDP - United Nations Development Programme (Duty station: a2i-project-Dhaka)

December 2020 - April 2020

Remote Collaboration

- Agent-Based Model simulation to predict the infection-growth and fatality rate of COVID-19 pandemic in Bangladesh.
- Design different interventions and forecast on the number of required hospital beds and projected ICUs etc.

### **Machine Learning Intern**

Facebook Inc. (Instagram Home Core Ranking)

September 2020 - December 2020

New York City, NY

- Unsupervised viewer-author representation for Instagram home-feed ranking using Contrastive learning.

### **Research Intern**

Intel Labs (Parallel Computing Lab)

May 2019 - August 2019

Santa Clara, CA

- Intel DARPA HIVE: Acceleration of Machine Translation.
- Modified TensorFlow's core implementation and kernels to improve the performance on Intel x86 architecture.

### **Genome Informatics Research Intern**

Philips Research (North America)

May 2018 - August 2018

Cambridge, MA

- Data analytics of next-generation sequencing (NGS) to facilitate personalized drug design for cancer patients.
- *Multi-sample Genome Variation Graph*: An enhanced genome alignment technique to capture complex variation structures of genome in a compact space and statistical analysis of haplotypes to define their role on healthy and diseased patients. [**International Patent Number: WO 2021/058683 A1**]

### **Software Engineer**

AnyConnect Private Limited

October 2015 - June 2016

Singapore - HQ

- *ConnectCloud*: Design and implementation of Communication SDK.
- R&D on SaaS for **IoT** (internet-of-things) integration.

## Software Engineer

*Eyeball Networks Inc.*

October 2013 - September 2015

*Dhaka, Bangladesh*

- *MS-SIP Library*: Design and Implementation of MS-PRES, MS-SIPCOMP (LZ77-8K), Desktop Application Sharing, Simultaneous Multi-Video call (including hold-resume, add/remove video), Runtime Video Resolution and Codec Change, AnyBandwidth Technology, Multi-User Login and Different RTP-RDP-RTCP Protocols in MS-SIP Library.
- *Technologies Used*: C++, OpenSSL, TCP, UDP, TLS, RTP, RTCP, SRTP, STUN, TURN, ICE etc.

## Software Engineer

*Mukto Software Ltd.*

April 2013 - September 2013

*Dhaka, Bangladesh*

- *BMET File Manager*: Implemented an internal file management system of BMET (Bureau of Manpower, Employment and Training) for the government of Bangladesh.

## TEACHING EXPERIENCE

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### Trainer and Coach: ACM ICPC (International Collegiate Programming Contest)

*Stony Brook University (Club Advisor: SBU Competitive Programming Club - CompProg) 2021 - Present*

*Stony Brook University (President: SBU Competitive Programming Club - CompProg) Sep. 2017 - 2020*

*Shahjalal University of Science and Technology (Trainer: SUST ACM Lab) June 2010 - February 2013*

- Designed and conducted numerous workshops on programming languages, data structures, and algorithms.
- Involved in problem setting, judging, and arranging online/onsite practice contests.
- Actively collaborated with SBU WiCS organization to increase the involvement of female participants in the competitive programming.
- Writing grants and proposals to manage club funding.

### Guest Lecturer

*Computer Science Department @ SUNY-SB*

*Stony Brook, NY*

- CSE 613: Parallel Programming (Topic: The Message Passing Interface) *Spring 2018, Spring 2019*
- CSE 548: Analysis of Algorithms (Topic: Divide and conquer algorithms) *Fall 2018*

### Teaching Assistant

*Computer Science Department @ SUNY-SB*

*August 2016 - December 2017*

*Stony Brook, NY*

- Conducted Recitation, created and graded quizzes, home-works and programming assignments.
- **Course List**: Analysis of Algorithms (CSE 548), Introduction to Programming in C (CSE 130), Legal, Social, and Ethical Issues in Information Systems (CSE 312).

## PATENTS

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- **Z. Ahmad**, A. Mankovich, Y. Cheung. **Variation Calling for Multi-Sample Variation Graphs**. International Publication Number: **WO 2021/058683 A1**. Publication Date: *01 April 2021*. International Application Number: *PCT/EP2020/076785*.

## PUBLICATIONS

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- **Z. Ahmad**, R. Chowdhury, R. Das, P. Ganapathi, A. Gregory, Y. Zhu. **Speeding up Stencil Computation using Gaussian Approximations**. [SODA'22, Under Review]
- **Z. Ahmad**, R. Chowdhury, R. Das, P. Ganapathi, A. Gregory, Y. Zhu. **Brief Announcement: Faster Stencil Computations using Gaussian Approximations**. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA'22)
- F. Farheen, MS. Shamil, S. Jony, **Z. Ahmad**, K. Sojib, A. Chowdhury, SM Arifin, A. Sania. **An Agent-Based Model for COVID-19 in Bangladesh**. [Infectious Disease Modelling, Under Review]
- **Z. Ahmad**, M. Javanmard, G. Croisdale, A. Gregory, P. Ganapathi, LN. Pouchet, R. Chowdhury. **Fourst: A code generator for FFT-based fast stencil computations**. IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS'22)
- **Z. Ahmad**, R. Chowdhury, R. Das, P. Ganapathi, A. Gregory, Y. Zhu. **Fast Stencil Computations using Fast Fourier Transforms**. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA'21) [Outstanding Paper Award]

- **Z. Ahmad**, R. Chowdhury, R. Das, P. Ganapathi, A. Gregory, M. Javanmard. **Low-Depth Parallel Algorithms for the Binary-Forking Model**. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA'21) [Outstanding Paper Award]
- B. Bijoy, S. Saba, A. Sharma, J. Rahman, M. Hamid, **Z. Ahmad**, R. Islam, A. Khan, M. Amin. **Participatory Syndromic Surveillance System in Bangladesh Enables Tracking the Spread of COVID-19 Symptoms Using Communal Self-Screening Test Data** [KDD DSHealth'21, Under Review]
- **Z. Ahmad**, A. Al-Kium, R. Ahammed, ST Mouni, M. Amin. **Peritraumatic Distress of COVID-19 on Healthcare Workers: implications and policy recommendations** [Under Review]
- A. Sania, F. Oishi, S. Shamil, **Z. Ahmad**, N. Arifin, MS Rahman. **An agent-based model for transmission and control of COVID-19 pandemic in Bangladesh**. Society for Epidemiologic Research (SER'21)
- P. Nookala, **Z. Ahmad**, M. Javanmard, M. Kong, R. Chowdhury, R. Harrison. **Understanding Recursive Divide-and-Conquer Dynamic Programs in Fork-Join and Data-Flow Execution Models**. International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS'21)
- **Z. Ahmad**, S Duppala, R. Chowdhury, S. Skiena. **Improved MapReduce Load Balancing through Distribution-Dependant Hash Function Optimization**. IEEE International Conference on Parallel and Distributed Systems (ICPADS'20)
- M. Javanmard, **Z. Ahmad**, J. Zola, LN. Pouchet, R. Chowdhury and R. Harrison. **Efficient Execution of Dynamic Programming Algorithms on Apache Spark**. IEEE International Conference on Cluster Computing (CLUSTER'20)
- M. Javanmard, **Z. Ahmad**, M. Kong, LN. Pouchet, R. Chowdhury and R. Harrison. **Deriving Parametric Multi-way Recursive Divide-&-Conquer Dynamic Programming Algorithms using Polyhedral Compilers**. International Symposium on Code Generation and Optimization (CGO'20)
- M. Javanmard, P. Ganapathi, R. Das, **Z. Ahmad**, S. Tschudi, R. Chowdhury. **Toward Efficient Architecture Independent Algorithms for Dynamic Programs**. International Conference on High Performance Computing 2019 (ISC'19) (pp. 143 - 164)
- M. Javanmard, P. Ganapathi, R. Das, **Z. Ahmad**, S. Tschudi, R. Chowdhury. **Toward Efficient Architecture Independent Algorithms for Dynamic Programs**. 24th Symposium on Principles and Practice of Parallel Programming (PPoPP'19) (pp. 413 - 414) [Poster]

## PROJECTS

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- **An automated rating prediction model for games in Google Play Store.** *Sept. 2017 - Dec. 2017*
- **PathCache v2.0: An enhanced traceroute path prediction toolkit.** *Jan. 2017 - Apr. 2017*
- **Deep learning based question answering using Semantic Role Label data.** *Sept. 2016 - Dec. 2016*

## REWARDS AND ACHIEVEMENTS

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- Awarded for **5<sup>th</sup>** place in **ACM ICPC 2011 Asia Regional Dhaka Site.** **SUST\_POTHIKRIT**
- Awarded for **11<sup>th</sup>** place in **SUST National Collegiate Programming Contest - 2010.** **SUST\_3!3**
- Awarded for **16<sup>th</sup>** place in **ACM ICPC 2011 Regional Warm up contest.** **SUST\_POTHIKRIT**
- Awarded for **20<sup>th</sup>** place in **ACM ICPC 2012 Asia Regional Dhaka Site.** **SUST\_SPONDON**
- **TopCoder** - contest rating: **1190** (82 rated contests) **zafar\_sust\_bd**
- **Codeforces** - contest rating: **1689** (59 rated contests) **zafar\_sust\_bd**
- Recipient of **Education Board Scholarship** from 2009 to 2013.

## PROFILE

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LinkedIn <https://www.linkedin.com/in/zafar-ahmad>  
 GitHub <https://github.com/zafarsustbd>

## SKILLS AND EXPERTISE

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C/C++(Preferred), MPI, Cilk Plus, OpenMP, CUDA, PAPI, TensorFlow, PyTorch, Python, Java, SQL, Git etc.