

Arghya Bhattacharya

24 University Dr, East Setauket, NY - 11733



Research Interest

- External memory algorithm
- Parallel algorithm
- Machine learning
- Online algorithm
- Filesystem aging
- Probability and tail inequality
- Data structure

Technical skills

| | |
|-------|--------|
| C++ | Python |
| Shell | Latex |
| MySQL | Keras |

Scores

| | |
|-----------|--------------|
| GRE | 322 (170(Q)) |
| CAT'17 | 97.61%ile |
| TOEFL iBT | 106 |

Work Experience

Stony Brook University

Research Assistant

Stony Brook, NY

Summer 2019 - Present

- **Cache-efficient algorithms:** Designed theoretically good cache-efficient external memory algorithms that do not degrade in the face of memory fluctuations that are common in the most modern systems.
- **Threading ecosystem:** Built a framework to evaluate the performance of external memory algorithms with multi-threading in a multi-program environment.
- **Filesystem aging:** Evaluated microbenchmarks and application-level fragmentation benchmarks to measure slowdown in the random read performance for several production filesystems (ext4, btrfs, xfs, zfs, and f2fs) as well as a write-optimized in-kernel filesystem *BetrFS*.
- **Machine-learning augmented algorithms:** Redesigned traditional online algorithms for rent-or-buy problems with augmentation by single and multiple machine learning oracles.

High School Women in Science and Engineering (HS-WISE)

Mentor

Stony Brook, NY

Fall 2019 - Present

- Lesson: Basics of probability and Thinking algorithmically.
- Shoreham-Wading River High School (2019-20), Comsewogue High School (2020-21), Hauppauge High School (2021-22).

Stony Brook University

Teaching Assistant

Stony Brook, NY

Fall 2018 - Spring 2019

- Fundamentals of Information Technology (ISE 218), Prof. Kevin McDonnell
- System Fundamentals - II (CSE 320), Prof. Eugene Stark

National University of Singapore

Research Engineer

Singapore

May 2018 - Aug 2018

- Advised by Prof. Dipti Srinivasan, Centre for Green Energy Management & Smart Grid (GEMS), Dept. of Electrical and Computer Engineering.
- Performance of multi-objective optimization algorithms using evolutionary computation based on decomposition techniques.

Pricewaterhouse Coopers (PwC) India Pvt. Ltd.

Consultant

Kolkata, India

July 2016 - Sept 2017

- Payroll Automation using DotNet technologies using MVC architecture.
- Implementation of Microsoft Navision ERP 2016 for Finance Automation and Inventory Management.

Jadavpur University

Summer Intern

Kolkata, India

May 2015 - Aug 2015

- Advised by Prof. Debangshu Dey, Measurement and Instrumentation Laboratory, Dept. of Electrical Engineering.
- Algorithms used in affective computing for Human Machine Interaction.

- Biomedical Image Processing tools and algorithms and Cancer Detection using Optical Colonoscopy Videos.
- **Indian Institute of Technology, Kharagpur** Kharagpur, India
May 2014 - Aug 2014
 - Summer Intern*
 - Advised by Prof. Jayanta Mukhopadhyay, Telemedicine Laboratory, Dept. of Computer Science.
 - Design of a Portable Electronic Device for Non-invasive continuous measurement of Blood Pressure by Bio-impedance measurement and Assessment of Cardiac Health in larger perspective.

Education

- **Stony Brook University** New York, USA
Fall 2018 – Present
 - Ph.D. Candidate, Dept. of Computer Science*
 - **Advisor:** Prof. Michael A. Bender, **Collaborator:** Rezaul A. Chowdhury
 - Cumulative GPA 3.78 / 4.0
 - **Courses:** Analysis of Algorithms, Computer Networks, Discrete Maths, Data Science, Introduction to Computer Vision, Theory of Database Systems, Medical Imaging.
 - **Class Projects:**
 - * Optimizing network congestion window using Ricci Curvature under Prof. Aruna Balasubramanian.
 - * Semantic segmentation using U-Net and instance segmentation of nuclei using Mask R-CNN under Prof. Dimitris Samaras.
 - * Identifying fundraising donors with Logistic Regression, Decision Tree, Random Forest and LightGBM under Prof. Steven S. Skiena.
- **Jadavpur University** Kolkata, India
Jul. 2012 – May. 2016
 - B.E. in Electrical Engineering*
 - Cumulative GPA: 7.74/10 Total marks: 72.69/100 with First Class
 - Qualified GATE 2016 in Electrical Engineering Score: 45.66 GATE Score: 584/1000 Rank: 3278
 - **Related Coursework:** Advanced Instrumentation-I, Advanced Instrumentation-II, Digital Signal Processing, Numerical Analysis and Computer Programming, Reliability Engineering, Signals and Systems, Circuit Theory, Control System Engineering
 - **Class Projects:**
 - * Blind Signal Processing
 - * Cryptography: Different Encryption Algorithms and Hacking Protocols in Brief.
- **Howrah Zilla School** Howrah, India
2002 - 2012
 - Secondary Education and Higher-Secondary Education*
 - 367th in the West Bengal Joint Entrance Examination, 2012.
 - State Rank of 372th in the AIEEE, 2012.
 - 82% in Higher Secondary Examination with Science Major (+2 level), with 90.5% in the Mathematics and Physics, 2012 West Bengal Council of Higher Secondary Education.
 - 85% in Madhyamik Examination (10 level), 2010, with 95.33% in the Science group (Mathematics, Science and Life Science) West Bengal Board of Secondary Education.

Selected Publications & Posters

- **Bhattacharya, A.**, Das, R. “Machine Learning Advised Ski Rental Problem with a Discount,” *16th International Conference and Workshops on Algorithms and Computation (WALCOM'22)*.
- Conway, A., Bakshi, A. **Bhattacharya, A.**, Bennett, R., Jiao, Y., Knorr, E., Bender, M.A., Jannen, W., Johnson, R., Kuszmaul, B.C., Porter, D.E., Zhan, Y., and Farach-Colton, M. “File System Aging,” submitted in *ACM Transactions on Computer Systems (TOCS)*.
- **Bhattacharya, A.** “Progress Imbalance in Multi-process Performance,” *Graduate Research Day (2021), Dept. of Computer Science, Stony Brook University*.
- **Bhattacharya, A.**, Choudhury, D., and Dey, D. “Edge-enhanced Bi-dimensional empirical mode decomposition based emotion recognition using fusion of feature set,” *Soft Computing, Springer (2018) 22: 889–903*.

- **Bhattacharya, A.**, Choudhury, D., and Dey, D. "Emotion Recognition from Facial Image Analysis Using Composite Similarity Measure Aided Bi-dimensional Empirical Mode Decomposition," *First IEEE Conference on Control, Measurement and Instrumentation (CMI'16)*.
- Biswas, M., **Bhattacharya, A.**, and Dey, D. "Classification of Various Colon Diseases in Colonoscopy Video using Cross-Wavelet Features," *IEEE International Conference on Wireless Communications Signal Processing and Networking (WiSPNET'16)*.

Achievements

- Winner, Best Security Hack, SBUHack'21, Steganographic Attack
- Winner, SparkHACK, Dept. of Elec Engg, Jadavpur University presented by NASSCOM 10000 START-UPS (2015). "Technical prototype and business model of LPG Optimization System"
- Best Pitching Award in Glocal Camtech Jugaad-a-thon, 2014, Kolkata; Design of 'Tattle-tale Pillbox'
- Third position in CIRCUISTIC 1.0 of CONVOLUTION 2014, Department of Electrical Engineering, Jadavpur University.
- Jagadish Bose National Science Talent Search Senior Scholarship, (JBNSTS) 2012
- Second highest scorer in the entrance exam of Presidency University, B.Sc. Physics Honors, 2012-13
- Highest Scorer in the entrance exam of Ramakrishna Mission Vidyamandira, B. Sc. Physics Honors, 2012
- National Means-cum-Merit Scholarship, 2008 (State Level) for the students of Class-IX