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Education

Ph.D. in Computer Science and Software Engineering Auburn University, USA Advisor: Dr. Debswapna Bhattacharya G.P.A: 3.79	Fall 2021
M.Tech in Distributed and Mobile Computing Jadavpur University, India Advisor: Dr. Pampa Sadhukhan C.G.P.A: 8.11	June 2014
B.Tech in Information Technology Bengal Institute of Technology, India C.G.P.A: 7.67	June 2011

Employment

Assistant Professor, Computer Science and Engineering Department, Chaibasa Engineering College, India, July 2014 – Aug 2017.

Teaching Experience

As a Teaching Assistant at Auburn University (Fall 2017 – Summer 2020)

1. **Fundamental of Computing I (COMP 1210)**: It introduces the fundamentals of computing as well as certain aspects of software engineering, which enables students to construct logical, readable, and correct programs. I was a lab instructor of this course from Fall, 2017 to Spring, 2019. My supervisor was Dr. James Cross.

2. **Computational Intelligence & Adversarial Machine Learning (COMP 5970/6970)**: It is a graduate-level course, which introduces concepts of Evolutionary Computation, Machine learning techniques such as SVM, NN, Naïve Bayesian Classifiers, Adv Machine learning. I was a TA of this course in Fall, 2019 and my supervisor was Dr. Gerry Dozier.

ONLINE

3. **Introduction to Computer Science I & II (CPSC 1213 and 1223)**: These courses are the online version of COMP 1210. I was a (virtual) lab instructor of this course from Fall, 2018 to Spring, 2020. My supervisor was Dr. James Cross.

4. **Data Structures (CPSC 1233)**: It is designed to introduce fundamental data structures and associated algorithms, as well as applications in which they are commonly used. I was a (virtual) lab instructor of this course in the Summer, 2020 and my supervisor was Dr. Dean Hendrix.

As an Assistant Professor at Chaibasa Engineering College (July 2014 – August 2017)

- 1. Discrete Mathematics (MH1401):** This course was designed for fourth-semester undergraduate Computer Science and Engineering (C.S.E.) students, which covered Logic, Set, Relation, Function, Induction and Recursion, Counting, Graphs, and Trees. I supervised this course, where the number of enrolled students was 46 (2013-17 batch) and 49 (2014-18 batch).
- 2. Operating System (CS1504):** This course covered Thread, Process Management, Memory Management, and Disk Management. I supervised this course, where the number of enrolled students was 48 (2014-18 batch). This course is designed for fifth-semester undergraduate C.S.E. students.
- 3. Digital logic (CS1302):** This course covered the Combinational Logic circuit as well as the Sequential Logic Circuit with applications. Around 50 third-semester undergraduate students of the C.S.E. department of 2013-17 and 2014-18 batches, respectively, took this course.
- 4. Data Structure using C (CS1402):** Fourth-semester undergraduate C.S.E. students of 2013-17 and 2014-18 batches as well as fifth-semester undergraduate Electrical Engineering (E.E.) students of 2013-17 batch took this course, where Array, Linked List, Stack, Queue, Sorting and Searching, Tree, and Graph were covered in C.
- 5. Analysis and Design of Algorithm (CS1606):** Sixth-semester undergraduate C.S.E. students of 2013-17 batch took this course, where Elementary Data Structures, Sorting, Hashing, Trees, Graphs, Dynamic Programming, and Greedy Algorithms were covered.
- 6. Formal Language and Automata Theory (CS1501):** Fifth-semester undergraduate C.S.E. students of 2013-17 batch took this course where Finite automata, Context-free Grammars, Decidability, and Intractability were covered. The number of enrolled students was 46.
- 7. Programming in Python:** Almost 50 students took this course as their summer training in 2017, and it covered Control flow, Function and Module, Files, Input/Output, List, and Dictionary.
- 8. Programming in C:** I tutored around 20 struggling students in 2015 and 2016. It covered Control flow, Function, Arrays, Pointers, Structures, and Files. Since C was the first programming language that they were learning, I guided students one-to-one to enable them to do well in learning C.
- 9. Introduction to Computing (CS1201):** This was an introductory course offered to freshman undergraduate students. The number of enrolled students was 92, 94, and 87 in 2014, 2015, and 2016, respectively.

Research Experience

- Ph.D. dissertation research Fall 2017 – Fall 2021
Advisor: Dr. Debswapna Bhattacharya, Assistant Professor
Title: New computational and data-driven methods for protein homology modeling (Publication in Nature Scientific Reports, PROTEINS, PLOS, Bioinformatics, Frontiers; and two other manuscripts under review)
Institute: Auburn University
- M.Tech thesis July 2013 – April 2014
Advisor: Dr. Pampa Sadhukhan, Assistant Professor
Title: Impact of the placement strategies of access points on the performance of clustering-based fingerprinting localization system
Institute: Jadavpur University, India

Technical Skills

Data Science Tools: Python3, TensorFlow 2.0, Keras, scikit-learn, R
Data Visualization Tools: Matplotlib, Seaborn
Molecular Visualization Tools: PyMOL, Chimera
Languages known: Python, C, C++, Java, Perl, R
Misc.: Academic Research, Teaching

Honors and Awards

- (8) Work has been selected for **Highlight Talk** in the 12th ACM-BCB conference (Virtual), Aug 1-4, 2021.
- (7) **Fellowship award** for ISMB/ECCB 2021 conference (Virtual), July 25 – 30, 2021.
- (6) **Best Poster** award in the 11th ACM-BCB conference (Virtual), Sept 21-24, 2020.
- (5) Work has been selected for **Highlight Talk** in the 10th ACM-BCB conference, Niagara Falls, NY, Sept 7-10, 2019.
- (4) Paper got published as the **Front Cover Article** in the July 2019 issue of Proteins: Structure, Function, and Bioinformatics journal.
- (3) Awarded **Young Research Excellence Award** (2nd place) at 16th Annual MCBIOS Conference, Birmingham, USA, 2019.
- (2) Awarded Travel grant to attend 16th Annual MCBIOS Conference, Birmingham, USA, 2019.
- (1) A.I.C.T.E. **National Scholarship** for M.Tech at Jadavpur University, Kolkata, India [2012 – 2014].

Peer-reviewed Publications

Book Chapter

- (1) **S. Bhattacharya**, R. Roche, M. H. Shuvo, D. Bhattacharya, “Contact-assisted threading in low-homology protein modeling”, *Methods in Molecular Biology*, by **Springer Nature**, 2021 (Under revision). (*Impact Factor: 10.71*)

Journals

- (7) **S. Bhattacharya**, R. Roche, M. H. Shuvo, D. Bhattacharya, “Recent advances in protein homology detection propelled by inter-residue interaction map threading”, **Frontiers in Molecular Biosciences**, 8, 377 (2021). (*Impact Factor: 3.590*)
- (6) R. Roche, **S. Bhattacharya**, D. Bhattacharya, “Hybridized distance- and contact-based hierarchical structure modeling for folding soluble and membrane proteins”, **PLOS Computational Biology**, 17(2): e1008753, (2021). [**Highlight Talk**]. (*Impact Factor: 4.428*)

- (5) A. McGehee, **S. Bhattacharya**, R. Roche, D. Bhattacharya, “PolyFold: An interactive visual simulator for distance-based protein folding”, **PLoS ONE**, 15(12): e0243331 (2020). [**Best Poster Award**]. (*Impact Factor: 2.740*)
- (4) **S. Bhattacharya**, R. Roche, D. Bhattacharya, “DisCovER: distance- and orientation-based covariational threading for weakly homologous proteins”, **bioRxiv**, (2020). (Under revision) [**First method to utilize inter-residue orientation into threading**], [**Selected for 29th ISMB/ECCB Talk**].
- (3) M. H. Shuvo, **S. Bhattacharya**, D. Bhattacharya, “QDeep: distance-based protein model quality estimation by residue-level ensemble error classifications using stacked deep residual neural networks”, **ISMB Proceedings, Bioinformatics**, 36(S1): i285-i291 (2020). (*Impact Factor: 5.610*)
- (2) **S. Bhattacharya**, D. Bhattacharya, “Evaluating the significance of contact maps in low-homology protein modeling using contact-assisted threading”, **Nature Scientific Reports**, 10(1), 1-13 (2020). (*Impact Factor: 4.379*)
- (1) **S. Bhattacharya**, D. Bhattacharya, “Does inclusion of residue-residue contact information boost protein threading?”, **Proteins: Structure, Function, and Bioinformatics**, 87(7): 596-606 (2019). [**Front Cover Article**], [**Highlight Talk**], [**Top Downloaded Paper of 2018-2019 by WILEY**]. (*Impact Factor: 3.756*)

Abstracts

- (2) **S. Bhattacharya**, D. Bhattacharya, “How Effective is Contact-assisted protein threading?”, **BCB'19: Proceedings of the 10th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics**, September 2019, Pages 553 (2019).
- (1) **S. Bhattacharya**, D. Bhattacharya, “Contact-assisted protein threading: an evolving new direction”, **BCB'19: Proceedings of the 10th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics**, September 2019, Pages 536 (2019).

Posters

- (6) **S. Bhattacharya**, R. Roche, D. Bhattacharya, “DisCovER: distance- and orientation-based covariational threading for weakly homologous proteins”, 29th ISMB/ECCB conference, Virtual Event, July 25-30, 2021.
- (5) A. McGehee, **S. Bhattacharya**, R. Roche, D. Bhattacharya, “PolyFold: An interactive visual simulator for distance-based protein folding”, 11th ACM-BCB Conference, Virtual Event, Sept 21-24, 2020. (**Best Poster Award**)
- (4) **S. Bhattacharya**, D. Bhattacharya, “Contact-assisted protein threading: an evolving new direction”, 2019 Graduate Engineering Research Showcase, Auburn University, USA, November 7, 2019.
- (3) **S. Bhattacharya**, D. Bhattacharya, “Contact-assisted protein threading: an evolving new direction”, 10th ACM-BCB Conference, Niagara Falls, NY, Sept 7-10, 2019. [[pdf of the poster](#)]

(2) **S. Bhattacharya**, D. Bhattacharya, “Does inclusion of residue-residue contact information boost protein threading?”, 16th Annual MCBIOS Conference, Birmingham, USA, March 28-30, 2019. [[pdf of the poster](#)]

(1) **S. Bhattacharya**, D. Bhattacharya, “A new contact-assisted threading approach for predicting more accurate protein 3D structure”, 2018 Graduate Engineering Research Showcase, Auburn University, USA, October 28, 2018.

Oral Presentations

(4) **S. Bhattacharya**, R. Roche, D. Bhattacharya, “DisCovER: distance- and orientation-based covariational threading for weakly homologous proteins”, 29th ISMB/ECCB conference, Virtual Event, July 25-30, 2021.

(3) **S. Bhattacharya**, D. Bhattacharya, “How Effective is Contact-assisted Protein Threading?”, 10th ACM BCB Conference, Niagara Falls, NY, Sept 7-10, 2019. (**Highlight Talk**)

(2) **S. Bhattacharya**, D. Bhattacharya, “Does contact information powered by deep learning boost protein threading?”, Student Symposium, Auburn University, USA, April 9, 2019.

(1) **S. Bhattacharya**, D. Bhattacharya, “Does inclusion of residue-residue contact information boost protein threading?”, 16th Annual MCBIOS Conference, Birmingham, USA, March 28-30, 2019. (**Won 2nd place in student oral presentation**). [[News](#), [Proceedings](#)]

Service & Outreach

(2) Reviewer of Nature Scientific Reports. 2021

(1) External reviewer of IEEE-BIBM conference, San Diego, CA, USA. 2019

Professional Membership

(1) International Society for Computational Biology (ISCB) Since 2021

References

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