

# SUMIT TARAFDER

✉ [sumittarafder@vt.edu](mailto:sumittarafder@vt.edu)  [sumittarafder.github.io](https://sumittarafder.github.io)  [github.com/SumitTarafter](https://github.com/SumitTarafter)

## Research Interests

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**Topics** 3D structure prediction, refinement or quality estimation of protein, RNA or associated complexes  
**Areas** Structural bioinformatics, Machine learning

## Education

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**Virginia Tech** **Aug. 2022 – Present**  
*Ph.D. student in Computer Science* *Blacksburg, VA*

**Bangladesh University of Engineering & Technology (BUET)** **Jan. 2022**  
*M.Sc. in Computer Science and Engineering* *Dhaka, Bangladesh*

**Bangladesh University of Engineering & Technology (BUET)** **Feb. 2017**  
*B.Sc. in Computer Science and Engineering* *Dhaka, Bangladesh*

## Experience

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**Virginia Tech** **Aug. 2022 – Present**  
*Graduate Research Assistant, Bhattacharya Lab* *Blacksburg, VA*

- Focused on projects related to the prediction and quality estimation of RNA 3D structures and protein-RNA complexes.
- Recently implemented research projects are available in *GitHub*.

**Virginia Tech** **Aug. 2022 – Dec. 2022**  
*Graduate Teaching Assistant, CS 5914 -TS: Warehouse Scale Computing* *Blacksburg, VA*

- Graded multiple paper review and summary writings for individual students and conducted office hours.

**United International University** **May 2017 – Oct. 2021**  
*Lecturer, Department of Computer Science and Engineering* *Dhaka, Bangladesh*

- I was the instructor and coordinator for a wide range of undergraduate-level theory and practical courses.

## Publications

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- **Sumit Tarafder**, Debswapna Bhattacharya. “*lociPARSE: a locality-aware invariant point attention model for scoring RNA 3D structures*”, *Journal of Chemical Information and Modeling*, Volume 64, Issue 22, Pages 8655–8664, **November 2024**. Impact Factor: 5.7
- **Sumit Tarafder**, Rahmatullah Roche, Debswapna Bhattacharya. “*The landscape of RNA 3D structure modeling with transformer networks*”, *Biology Methods and Protocols*, Volume 9, Page 47, Issue 1, **July 2024**. Impact Factor: 2.5
- **Sumit Tarafder**, Mazharul Islam, Swakkhar Shatabda, Atif Rahman. “*Figbird: A probabilistic method for filling gaps in genome assemblies*”, *Bioinformatics*, Volume 38, **August 2022**, Pages 3717–3724, Issue 15. Impact factor: 6.9
- **Sumit Tarafder**, Md. Toukir Ahmed, Sumaiya Iqbal, Md Tamjidul Hoque, M. Sohel Rahman. “*RBSURFpred : Modeling Protein Accessible Surface Area in Real and Binary Space using Regularized and Optimized Regression*”, *Journal of Theoretical Biology*, Volume 441, **January 2018**, Pages 44 - 57. Impact factor: 2.0
- Rahmatullah Roche, **Sumit Tarafder**, Debswapna Bhattacharya. “*Single-sequence protein-RNA complex structure prediction by geometric attention-enabled pairing of biological language models*”, **2024**. [Under Submission]
- Rahmatullah Roche, Bernard Moussad, Md Hossain Shuvo, **Sumit Tarafder**, Debswapna Bhattacharya. “*EquiPNAS: improved protein-nucleic acid binding site prediction using protein-language-model-informed equivariant deep graph neural networks*”, *NAR*, volume 52, Page e27, Issue 5, **January 2024**. Impact Factor: 14.9

## Talks

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- Presented our work “*lociPARSE*” as a poster and flash talk at *ISMB '24* (Montreal, CA)

## Awards

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**Travel Grant** Awarded by Department of Computer Science, Virginia Tech for *ISMB '24*  
**Fellowship** Pratt Fellowship from Department of Computer Science, Virginia Tech in '24  
**Dean's List Award** University Merit Scholarship & Dean's List from *BUET*

## Skills

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**Languages:** Python, Java, C, C++, HTML/CSS  
**Tools:** Git, Docker, Chimera, PyMOL, VS Code  
**Frameworks:** PyTorch, PyTorch Lightning, Matplotlib, Scikit-learn, Linux