

# Muntasir Wahed

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## Education

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### Virginia Tech

Ph.D. in Computer Science (GPA-**4.00/4.00**)

January 2021 - December 2024

Advisor: Dr. Ismini Lourentzou

Research Area: Machine Learning, Self-Supervised Learning, Natural Language Processing

### University of Dhaka

B.Sc. in Computer Science and Engineering (GPA-**3.66/4.00**)

January 2015 - December 2018

## Publications

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- Nuruddin Ahmed, **Muntasir Wahed**. *The De-democratization of AI: Deep Learning and the Compute Divide in Artificial Intelligence Research*, arXiv preprint arXiv:2010.15581 (2020)
  - Used Causal Inference methodologies and NLP (text extraction, topic modeling) on a novel dataset (273000 peer-reviewed articles from 63 top CS conferences) to examine the top knowledge-producing organizations in AI.
  - **Media Coverages:** [VentureBeat](#), [Scientific American](#), [Axios](#), [Marginal Revolution](#)  
**Cited by** [National Security Commission on Artificial Intelligence](#), [Stanford AI Index-2021](#)
- **Muntasir Wahed**, Daniel Gruhl, Alfredo Alba, Anna Lisa Gentile, Petar Ristoski, Chad Deluca, Steve Welch, and Ismini Lourentzou. *SAUCE: Truncated Sparse Document Signature Bit-Vectors for Fast Web-Scale Corpus Expansion*, Proceedings of the 30th ACM International Conference on Information and Knowledge Management (CIKM '21), November 1–5, 2021 (2021)
  - Used bit-vector document representation for corpus expansion, resulting in a reduction of memory footprint by 24%, retrieval of 6.8% more rare terms, and a reduction of query execution time by 78%.
- **Muntasir Wahed**, Redwan Ahmed Rizvee, Riddho Ridwanul Haque, Amin Masud Ali, Moinul Zaber, and Amin Ahsan Ali. *What Can Nighttime Lights Tell Us about Bangladesh?*, 2020 IEEE Region 10 Symposium, 5-7 June 2020, Dhaka, Bangladesh (2020)
- **Muntasir Wahed**, M M Abid Naziri, Mohammad Shoyaib, Muhammad Asif Hossain Khan. *Bangla Spell Checker: A Distance and Prior Probability Based Approach*, Jahangirnagar University-IIT-2017 (JJIT, Vol. 6, pp. 97-108)

## Experience

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### Virginia Tech

Graduate Research Assistant

May 10, 2021 - Present

Graduate Teaching Assistant ([CS2114](#))

December 2020 - May 2021

### Tiger IT Bangladesh Limited

Software Engineer (ML)

June 2020 - December 2020

- Conducted literature review and designed solutions using deep learning models in **Tensorflow** and **Pytorch** to solve image and signal processing problems including **face detection**, **video classification**, and analyzing **vital signs from video**.
- Built prototypes using Fast API and android studio to enable testing and gather feedback from users.

### Data & Design Lab

Research Assistant

April 2019 - June 2020

- Developed a dashboard for [BRAC](#), providing various interactive visualization support to foster policy-making.
- Implemented the Unique ID generation process, which enabled BRAC to uniquely identify its more than 100 million beneficiaries, facilitating the proper use of big data in policy-making.
- Analyzed the usability of satellite data as an economic proxy to identify regional inequality using **geospatial data analysis**.

### Enosis Solutions

Software Engineer

April 2019 - October 2019

- Developed and maintained features using Spring framework (Java), AngularJS, and MySQL database, leveraging skills in **Issue Tracking** (JIRA), **Unit Testing** (Mockito), **Debugging** (DevTools), and Agile development process.

## Beetles Cyber Security Ltd.

Backend Web Engineer (Intern)

July 2018 - November 2018

- Developed and maintained REST APIs using python (Django framework) and MySQL database, leveraging skills in **Version Control** (Git), developing **REST API** (Django), and generating **API Documentation** (Swagger).

## Skills

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**Programming** Python, C/C++, Java, JavaScript, R

**Web** Django, Spring, AngularJS, HTML5, SASS

**Libraries** Gensim, NLTK, Scikit-Learn, NumPy, Matplotlib, Pandas, Scipy, Tensorflow, Pytorch

**Miscellaneous** Linux, Git, REST API, LaTeX, Android Studio

## Projects

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### Bug Severity Classifier 🔗

- Built a model that classifies the severity of a bug report based on the description in three different datasets using smoothed Naive Bayes classifier and feature selection (Chi-Square and Minimum Redundancy and Maximum Relevance).

### Delivery Distribution System 🔗

- Implemented a model, that assigns deliveries to different delivery persons automatically using clustering algorithms, based on two different metrics - minimizing the delivery time and minimizing the number of delivery persons needed.

### NLP Tools for Bengali Language 🔗

- Built a POS tagger for Bengali using the Viterbi algorithm.
- Built a spell checker for Bengali using Levenshtein distance, phonetic distance, and n-gram language model.

### Comparative Study of Question Routing in Question Answering Websites

- Built a prediction model to identify potential domain-specific experts capable of answering specific questions.
- Performed trend analysis to identify the decaying trend in the significance of community feedbacks and proposed a novel function that captures the temporal decay and evaluated the function on tf-idf, topic model, and tag-based approaches.

### Comparative Analysis of Academic and Non Academic Players

- Collected seasonal statistics of 500 players from different clubs of 7 different leagues in Europe, analyzed the data and drew a conclusion about the effectiveness of academic players playing in the same club.
- Modeled the efficacy of the players over different features, which was then used for inference and hypothesis testing.

## Extracurricular Activities

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### Competitive Programming

- **Team Participation:** ACM ICPC Dhaka Regionals 2017 (**5th**/148), SUST Inter University Programming Contest 2017 (**6th**/161), ACM ICPC Dhaka Regionals 2016 (**19th**/123), National Collegiate Programming Contest 2016 (**21st**/119)
- Worked as problem setter in National High School Programming Contest 2017, and HackerRank.

### Content Writing

- **Shoshikkha - Education Blog in Bengali:** founded the project and developed the website in 2015, contributed to the website as an author and editor of technical articles and tutorials about programming languages, data structures, and algorithms.