Amitabha Dey

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Work Experience

- **University of North Carolina at Greensboro** — Greensboro, North Carolina
  Lecturer, Department of Computer Science — *August 2023 - Present*
  - Fall 2023
    - CSC 105: Data, Computing, and Quantitative Reasoning → Course Webpage
    - CSC 250: Foundations of Computer Science I → Course Webpage
  - Spring 2024
    - CSC 330: Advanced Data Structures → Course Webpage
    - CSC 362: System Programming

- **University of North Carolina at Greensboro** — Greensboro, North Carolina
  Graduate Teaching Associate — *August 2021 - May 2023*
  - Fall 2021
    - CSC 250: Foundations of Computer Science I (Teaching Assistant)
    - CSC 330-02: Advanced Data Structures (Teaching Assistant)
    - CSC 340:02: Software Engineering (Teaching Assistant)
    - CSC 454-01: Algorithm Analysis / Design (Teaching Assistant)
  - Spring 2022
    - CSC 461-01/661-01: Principles of Computer Architecture (Teaching Assistant)
    - CSC 672-01: Database System Architecture (Teaching Assistant)
    - CSC 261: Computer Organization and Assembly Language (Teaching Assistant)
  - Summer 2022
    - CSC 250-01: Foundations of Comp Science I (Teaching Assistant)
  - Fall 2022
    - CSC 350-02: Foundations of Comp Science II (Instructor)
  - Spring 2023
    - CSC 350-02: Foundations of Comp Science II (Instructor)

- **UNCG Information Technology Services** — Greensboro, North Carolina
  Senior Information Technology Analyst — *January 2022 - April 2023*
  - Responsible for providing technical assistance to students and faculty staff members with their computer-related issues. Troubleshooting technical problems such as configuring network settings, data backup/recovery, reimaging computers, performing Multi-factor authentication (MFA) and password resets, fixing various other software/hardware issues, etc.

- **DevResonance Ltd.** — Dhaka, Bangladesh
  Data Scientist — *January 2018 - May 2020*
  - Utilized Python to implement a CNN model on 1TB of unstructured data, performed PCA and other dimensionality reduction techniques to reduce process time by 20% and improved classification accuracy by 15% by optimizing loss function. Increased customer retention rate by 13% as a result of these improvements.
  - Generated dynamic and interactive 3D visualizations with both linear and non-linear trendlines by integrating Plotly and Streamlit to allow clients to evaluate the impacts of interventions and monitor progress. Won grants of over $50,000 from Bill & Melinda Gates Foundation, UNICEF, WHO, Save the Children, etc.

- **Redgreen Corporation** — Dhaka, Bangladesh
  Data Science Intern — *July 2017 - September 2017*
  - Developed and implemented predictive regression models to project future sales by constructing feature space, performing data-preprocessing steps, and doing PCA resulting in an 87% accuracy, 12% better than previous years.
  - Built models to predict the possibility of faulty products and identify the manufacturers responsible. Cutting these manufacturers reduced the number of faulty components in the next quarter by 35% and increased MRR by $5K/mo. Developed a marketing analytics metrics dashboard to monitor sales conversion rate from Facebook Ads.

Education

- **University of North Carolina at Greensboro** — Greensboro, North Carolina
  Masters in Computer Science — *August 2021 - May 2023*
  - Relevant Coursework: Algorithm Analysis and Design, Big Data and Machine Learning, Data Science, Advanced Database Systems, Software Engineering, Data Visualization, Introduction to Probability.

- **BRAC University** — Dhaka, Bangladesh
  Bachelors in Computer Science — *August 2013 - December 2017*
  - Relevant Coursework: Algorithms, Data Structures, Automata and Computability, Computer Architecture, Artificial Intelligence, Computer Graphics, Computer Networks, Data Communications, Database Systems, Discrete Mathematics, Elements of Statistics and Probability, Numerical Methods, Object Oriented Programming, Operating Systems, Software Engineering.

Publications

- **Preprint**: Dey, Amitabha, and Shan Suthaharan. "LDEB–Label Digitization with Emotion Binarization and Machine Learning for Emotion Recognition in Conversational Dialogues." arXiv preprint arXiv:2306.02193 (2023).
- **Conference**: A. Dey, R. Z. Rafi, S. Hasan Parash, S. K. Arko and A. Chakrabarty, "Fake News Pattern Recognition using Linguistic Analysis," 2018 Joint 7th International Conference on Informatics, Electronics & Vision (ICIEV) and 2018 2nd International Conference on Imaging, Vision & Pattern Recognition (icIVPR), Kitakyushu, Japan, 2018, pp. 305-309, doi: 10.1109/ICIEV.2018.8641018.

Technical Skills

- **Language**: Python, R, SQL, PHP, Java, C, C++, JavaScript, Hadoop, Bootstrap, Ruby on Rails, MATLAB
- **Frameworks**: Pandas, NumPy, Scikit-learn, Keras, TensorFlow, PyTorch, Django, BeautifulSoup, NLTK, OpenCV
- **Tools**: SQLite3, Spark SQL, MongoDB, Docker, Amazon AWS, Microsoft Azure, LightGBM, Databricks, UTM
- **Statistics**: Probability, Hypothesis Testing, Regression, Time Series, Bayesian Statistics, K-means Clustering
- **Visualization**: Matplotlib, Plotly, Seaborn, GGplot2, Geoplotlib, Tableau, Qlik, D3.js, Microsoft Excel & Visio, Google Sheets

Selected Projects

- **Loan Defaulter Prediction**: Performed exploratory data analysis, feature engineering, and five-fold cross-validation. Applied Regularization - Ridge, Lasso, Elastic Net - on a Linear model to predict loan defaulting probability of A/C holders. Optimized loss function using Stochastic Gradient Descent. Improved classification accuracy by 10% compared to previous models.
- **Image Scraping WebApp**: Developed WebApp using Streamlit. Performed Canny Edge Detection, Convex Hull Contour Detection and Adaptive Thresholding with OpenCV. Deployed to Heroku. Developed optimized web crawlers using BeautifulSoup and Selenium - bypassed CAPTCHA & credential authentication. Exports JSON file.
- **Voice Controlled Jarvis**: Created a voice-controlled program using gTTS and speech recognition; the app can search and play songs on YouTube, search images, give weather updates, report time and date, report breaking news; Created Python libraries for separate components and functions.
- **Project Lead, Redgreen Corporation**: Led a team of 5 members to collaborate with a web development firm to develop a robust inventory management application. Designed application architecture and did routine code reviews. Created tickets for bug fixes and consulted with engineers to create prototypes. Pitched weekly to higher management and set clear organizational goals.

Honors and Awards

- **UNCG Merit Scholarship (2021)**: Awarded $16,000 for 14 months and In-state and Out-of-state tuition waiver by the Department of Computer Science and the Graduate School.
- **UNCG Outstanding Graduate Student Award (2023)**: Awarded the most prestigious award by the Department of Computer Science for the academic year 2022-23 in recognition of scholarly accomplishment and contribution to the department.
- **The Daily Star Award (2010)**: Awarded the National Daily Star Award for Edexcel IGCSE Students in 2010 for academic results - Further Mathematics (A*), Mathematics (A*), Chemistry (A*), Physics (A*), Economics (A), English (A), Bengali (A).

Extracurricular Activities

- President, Bangladesh Student Association - UNCG (2023 - Present)
- Student Senator - Computer Science, UNCG Graduate Student Association (2021 - 2023)
- Campus Ambassador, Arduino Bangladesh, BRACU (2015 - 2017)
- Campus Ambassador, droidcon Dhaka, BRACU (2017)
- Director, BRACU Computer Club (2013 - 2017)
- Convener, BRACU ACM Student Chapter (2014 - 2016)
- Mozilla Firefox Student Ambassador (2013 - 2015)