Shubhashis **Roy Dipta**

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EDUCATION

Ph.D. in Computer Science, University of Maryland, Baltimore County — Jan 2021 – June 2025 (Expected)

Specialization: **Vision Language Model** (VLM), **Natural Language Processing** (NLP), **Machine Learning** (ML)

- Phi Kappa Phi Award - **Top 10% of STEM**. GPA 4.00/4.00 – **Top 1% of class**.

PUBLICATIONS

Google Scholar

1. *Shubhashis Roy Dipta*, Mehdi Rezaee, and Francis Feraro. "Semantically-informed Hierarchical Event Modeling." Proceedings of the 11th Joint Conference on Lexical and Computational Semantics, ACL (2023)
2. *Shubhashis Roy Dipta*, and Sai Vallurupalli. "UMBCLU at SemEval-2024 Task 1A and 1C: Semantic Textual Relatedness with and without machine translation." Proceedings of the 17th International Workshop on Semantic Evaluation (SemEval-2024), NAACL (2024)
3. *Shubhashis Roy Dipta*, and Sadat Shahriar. "HU at SemEval-2024 Task 8A: Can Contrastive Learning Learn Embeddings to Detect Machine-Generated Text?." Proceedings of the 17th International Workshop on Semantic Evaluation (SemEval-2024), NAACL (2024)
4. *Shubhashis Roy Dipta*, [5 other Co-Authors]. "SEMal: Accurate protein malonylation site predictor using structural and evolutionary information." Computers in biology and medicine 125 (2020)
5. Sadia Islam, Shafayat Bin Shabbir Mugdha, *Shubhashis Roy Dipta*, [4 other Co-Authors]. "MethEvo: an accurate evolutionary information based methylation site predictor." Neural Computing and Applications (2022)
6. Md Easin Arafat, [9 Co-Authors including *Shubhashis Roy Dipta*]. "Accurately predicting glutarylation sites using sequential bi-peptide-based evolutionary features." Genes 11, no. 9 (2020)
7. Md Wakil Ahmad, [7 Co-authors including *Shubhashis Roy Dipta*]. "Mal-light: Enhancing lysine malonylation sites prediction problem using evolutionary-based features." IEEE access (2020)

EXPERIENCE

Incoming Research Intern, Scale.AI — June 2024 – Aug 2024

- Will be working in the Vision-Language Team.

Graduate Research Assistant, University of Maryland, Baltimore County — Jan 2021 – Present

Tech Stack: PyTorch, Python, Hugging Face, Scikit-Learn, LLM, SQL, Spacy, NLTK, Pandas, Numpy, Matplotlib, Seaborn, Weight & Biases, Hydra

- **Event Modeling:** Achieved **8.5% improvement** over prior state-of-the-art approaches **in 2 datasets** and **across 4 evaluation metrics** by designing a novel, hierarchical, semi-supervised event modeling framework. (Published & Presented on *SEM 23, ACL)
- **Multimodal Counterfactual:** Pioneering **first-of-its-kind** multimodal counterfactual dataset (**8k+ real-life events**), merging text and images for nuanced alternate timeline, a novel contribution to counterfactual reasoning and multimodal real-life event understanding.
- **Graph Convolutional Network:** Collaboratively developing a Graph Convolutional Network for language understanding and reasoning on 2 complex datasets (**250k+ data-driven event graphs**), advancing research in the field of graph-based deep learning.
- **Mentoring**: Supervising and providing research guidance to an undergraduate who is a member of an underrepresented group in CS.

Machine Learning (ML) Engineer, backpackbang.com — Oct 2018 – Mar 2019

Tech Stack: PyTorch, Keras, Hugging Face, Large Language Model, NLTK, Python, MySQL, Elasticsearch, AWS EC2, Node.js, React

- **Boosted the sale by ≈23%** by improving existing product recommendation system using *Product2Vec* embedding.
- **Decreased server cost by ≈10%** by implementing an AWS Lambda-based ML pipeline for online learning.

Founder & Chief Technology Officer, UniShopr.com — Jan 2019 – Jan 2021

Tech Stack: Python, Node.js, React, PostgreSQL, GraphQL, AWS Lambda, AWS Lightsail

- Single-handedly led a cross-functional team of 10, achieving **1,000+** active e-commerce users and **$100,000+/month** in orders.

PROJECTS

Portfolio

Bird Chirping Identification — Tech Stack: PyTorch, Keras, TensorFlow, Python, Matplotlib, Seaborn, EfficientNet

- Secured a top-70 Kaggle ranking (**Top 6% - Bronze Medal**) by using EfficientNet on the spectrogram images with a weighted ensemble of framed timespan. Achieved **61.2% micro-average F1-score**

SeeBel: Seeing is Believing — Tech Stack: Data Science, PyTorch, Matplotlib, Seaborn, Python, Torchvision, HRNet

- **Increased interpretability by ∼60%** (user survey) in computer vision segmentation tasks by designing a **real-time visualization tool** for semantic segmentation, introducing training time visualization.

Amazon [Crawler] [Search Engine] — Tech Stack: Elasticsearch, Node.js, Express.js, Python, Multithreading, GCP

- Designed a distributed web crawler using 200 Google Compute Engine instances to extract **1M products' data**, executed parallelism, and discussed cost-efficiency and scalability strategies for 10M to 100M items.
- **Enhanced the retrieval of 1M data** by implementing a **resource-efficient** search engine using Elasticsearch.

PROFESSIONAL SERVICES

- **Reviewer:** Reviewed 9+ papers in top NLP conferences & Bioinformatics journals.
- **Competitions:** 2 International Robotics Competitions (URC, USA; ERC, Poland), 2 ACM-ICPC, 25+ National Programming Competitions.
- **Open Source Contributions:** PyTorch Lightning, DocuSign