SHOWVIK BISWAS

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RESEARCH INTERESTS

Software Engineering | Software Security | Bioinformatics

WORK EXPERIENCE

Lecturer, Department of CSE, BRAC University

July 2024 –Present

Courses Teaching : Operating Systems | Computer Architecture | Algorithms

EDUCATION

Bachelor of Science in Computer Science & Engineering

Bangladesh University of Engineering & Technology

April 2019 – June 2024

CGPA : 3.85/4.0

Notable Courses : Operating Systems | Computer Architecture | Networking | Compiler | Computer Security | Machine Learning | Artificial Intelligence | Bioinformatics | Information System Design | Database

RESEARCH

ToxiShield: Enhancing Developer Collaboration through Real-Time Toxicity Filtering

Under Review for Publication

Software Engineering | Knowledge Distillation | NLP — 2024 - Current

- Built a framework that can detect and classify toxicity in GitHub PR code reviews in real-time, and propose a semantically equivalent non-toxic alternative to the user. Implemented the solution as a browser extension.
- Published a set of fine-tuned open-source LLMs that can be used to detoxify toxic code review comments with state-of-the-art scores.
- Curated a 10k comment parallel corpus using iterative prompt engineering and manual vetting, enabling text-style-transfer training that cuts residual toxicity to 1% while preserving $\geq$ 92% semantic overlap.
- The results showed that the fine-tuned lightweight LLMs outperformed proprietary heavy weight LLMs for both toxicity detection and detoxification tasks.

ColocEM: Modeling Genome-Wide Expressions Based on Colocalization Techniques from Spatial Transcriptomics Data

Bioinformatics | Cell-Cell Communication — 2023 - Current

- Developed a method that uses the activity of ligands and receptors to predict gene expression levels in various tissue regions.
- Introduced a novel method to capture dependencies among cell types in a confined region that improves upon results in the present literature.
- Developed a Python framework to automate the process of producing results and other spatial and temporal analyses.

NOTABLE ACADEMIC PROJECTS

Fantasy League

Database | DjangoREST | ReactJS | MaterialUI | PostgreSQL

Built a web-based mock of the original Fantasy Premier League with additional features using Django, ReactJS and Oracle as part of our Database Management sessional course offered in Level 2, Term 2.

CommuniCreate

NodeJS | React | PostgreSQL

Built a web-based marketplace for creative agencies and propsective customers as part of our Software Development sessional course in Level 4, Term 1.

Hiredo NodeJS

Built the backend for a web-based marketplace for blue-collar jobs. Users can send requirements of what jobs they need to be done, and applicants can actively respond to and track their jobs.

Ray Tracer OpenGL

Built a ray tracer as an assignment of our Computer Graphics course in Level 4, Term 1. The program featured a fully ray-traced scene-builder with arbitrary levels of reflection calculations to render the final image.

Flower Classification TensorFlow Python

Used existing CNNs and Transformer-based neural network architectures with state-of-the-art augmentation techniques to build a model which can identify 30+ different types of flowers from JPEG images as part of our Machine Learning course in Level 4, Term 2.

TECHNICAL SKILLS

- **Programming Languages:** C/C++, Java, Python, Javascript, x86 Assembly, SQL, Bash
- **Tools & Softwares:** Git, Docker, NS-2, CloudSim Plus, Autopsy
- **Frameworks & Libraries:** Django, DjangoREST, ReactJS, Material UI, Redux, OpenGL, PyTorch, Tensorflow, Sklearn, Pandas, Matplotlib
- **Database:** Oracle, PostgreSQL, Django ORM