Enam Biswas

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WORK EXPERIENCE

MONA AI

City: Saarbrücken | **Country:** Germany

[09/2024 – 08/2025] **Software Engineer**

Lead Developer – MONA Chatbot (AI Agentic System)

- **Solely responsible** for designing and deploying a **safe, compliant, and scalable** agentic AI system.
- **Architected the backend chatbot infrastructure**, optimizing token efficiency and **reducing costs by 5–12x**.
- Built an **extensible tool-integration framework**, enabling seamless scalability with multiple AI-driven tools.
- Developed **custom tools for the AI agent**, including:
    - **Smart communication schedulers** (automated future messaging with/without data refresh conditions).
    - **End-to-end RAG pipeline** (leveraging Pinecone for efficient retrieval-augmented generation).
    - **SMTP integration** for automated email workflows.
    - **LLM response testing framework** (task & goal-based evaluator for quality assurance).
    - **Workflow Builder** for testing and integrating SPA (single purpose agents).

Stack - Python, GCP, Pinecone, Git, Jira, etc.

CISPA Helmholtz Center for Information Security

City: Saarbrücken | **Country:** Germany

[08/2023 – 08/2024] **Research Assistant - Empirical Research Support (ERS) Team**

Worked in various projects -

1. **TimeLord**: An internal time management system for reaching team goals and maximizing resource allocation.
2. **Jupyter**: A web application for muli collaborative data science analysis system, bringing more functionality compared to the existing Notebook.

Using - Python, Django, HTML, CSS, JavaScript (ChartJS, React).

Deutsches Forschungszentrum für Künstliche Intelligenz (Lab - COS)

City: Saarbrücken | **Country:** Germany

[11/2021 – 01/2024] **Research Assistant - Machine Learning in Health / Smart Home**

Project Summary: A home automation for older people (some might have dementia) to support them by evaluating their mobility and mental health inside the household and providing constructive feedback to the health-care provider (by minimizing the usage of human inspection, the ground truth) about their health/hygiene/mobility using raw sensor data.

Responsibilities: As follows -

- Feature extraction from the raw sensor data.
- Using machine learning models to derive information close to ground truth.

Using - Python, GitLab.

Zentrum für Mechatronik und Automatisierungstechnik (ZeMA)

City: Saarbrücken | **Country:** Germany

[11/2021 – 08/2022]   **Research Assistant - Machine Learning and Mechatronics**

Main activities and responsibilities:

- Derive valuable insight from raw sensor data (cleaning, visualization, etc.) to automate problems in production/industry.
- To write Python API/script for robots of relevant tasks.
- To prepare Machine Learning demos of various applications.

Using - Python, GitHub.

East West University, Dhaka (Bangladesh)

[09/2017 – 04/2019]   **Undergraduate Teaching Assistant**

Instructed new Bachelor students in Lab and motivated them to gain desired course outcomes. Furthermore, helped the course instructor preparing laboratory materials and grading students.

Course (Programming Language) taught: Structured Programming (C), Object-Oriented Programming (C++), Database (MySQL), ArtificialIntelligence (Python, Prolog, MatLab), and Software Engineering (PHP, Python, MySQL).

PROJECTS

[01/2025 – Current]   **Vertical AI Agent | Python Library**

A Reflective LLM Workflow for AI Tool Integration

- Designed a **dual-LLM "reflective workflow"** (primary + validator LLM) to reduce hallucinations and improve tool-calling accuracy.
- Built a **dynamic tool marketplace skeleton**: Load APIs as LLM-compatible tools via JSON schemas, enabling seamless integration for small businesses.
- Features:
    - **Extensible authentication** (API Key, OAuth2, mTLS, HMAC).
    - **Mock tool server** for local testing with simulated auth.
    - **Multi-LLM support** (OpenAI, Anthropic, Gemini).
- Vision: Empower businesses to **publish APIs as LLM tools** and access pre-built AI services via a unified marketplace.

Note: *Currently in private repo and under continuous development. Feel free to ask for access!*

[2025]   **Pine Memory – Simplified AI Memory Management for Python**

A lightweight Python wrapper for *mem0* with sync/async support, built-in validation, and easy configuration. Streamline AI memory operations (add/search) with OpenAI, Gemini, and Pinecone integration. Perfect for multi-tenant apps.

Link: https://github.com/e-biswas/pine_memory

[2023 – 2024]   **Leveraging Contextual Information for Spoiler Detection in Movie Reviews**

MSc Thesis | *(Presented - Dec 2024)*

- **Surpassed existing research benchmarks** and outperformed small LLMs (*Llama 3.1 8B Instruct*) with my novel approach.
- Achieved **performance comparable to GPT-4**, demonstrating state-of-the-art results in spoiler chunk detection in text.

Link: https://github.com/e-biswas/masters_thesis

[2023]   **Twitter Sentiment Challenge**

Machine Learning Course Challenge | Sentiment Classification & Regression

- **Ranked 1st overall** in a competitive class project, outperforming peers in sentiment analysis (classification & regression).

Link: https://github.com/e-biswas/twitter_sentiment_ML23

[2015 – 2019] **Undergraduate Projects**

1. Recommendation of Machine Learning Algorithm for Maintaining a Health Insurance System: The research works provide few proposals of suitable machine learning algorithms and a preferable system for any Health Insurance Company to maximize profit.
2. Sudoku Solving Using Genetic Algorithm: Developed in Python for Artificial Intelligence course. Which can solve the existing Sudoku board and generate a new Sudoku board on the basics of genetic algorithm.
3. Movie Review & Rating Website: Developed in HTML, PHP, and CSS using MySQL database for Software Engineering course. Provides a website like IMDB and similar functionalities.
4. Finding Local Food Store in Local Area: Developed in C++ on shortest path algorithmic implementation. Provides an application that suggests local food stores.
5. BanglaLink Help Menu Simulation: Developed in C++ on the basics of Object-Oriented Programming. Provides simulation program that works like BanglaLink (a telecommunication company) help menu.

[2020 – Current] **Open Source Datasets**

1. **Bangla Newspaper Dataset - ebD**: Containing almost 1.7M Bangla news articles. DOI: 10.34740/KAGGLE/DSV/1857507.
2. **IMDb Review Dataset - ebD**: Containing almost 5.5M reviews along with 1.2M spoilers from IMDb. DOI: 10.34740/KAGGLE/DSV/1836923.
3. **Place Review Dataset - Niche (USA)**: Containing more than 700,000 reviews-rating of the American neighborhood. DOI: 10.34740/KAGGLE/DSV/1842046.

EDUCATION AND TRAINING

[04/2021 – 07/2024] **Masters Degree in Data Science and Artificial Intelligence**

Saarland University www.uni-saarland.de

[07/2020 – 03/2021] **Commonwealth of Learning - Coursera Scholarship**

Commonwealth of Learning www.col.org

Courses: Discrete Math and Analyzing Social Graphs, Matrix Algebra for Engineers, Machine Learning.

Specializations: Python for Everybody, Python 3 Programming, Statistics with Python, Deep Learning, Natural Language Processing, Mathematics for Machine Learning, Generative Adversarial Neural Networks, TensorFlow Developer, TensorFlow: Advanced Techniques.

[05/2015 – 04/2019] **Bachelor of Engineering in Computer Science & Engineering**

East West University, Dhaka (Bangladesh) www.ewubd.edu

Awards: *Summa Cum Laude*, Full Free Scholarship for 4 years, all possible (3 times) Dean's Scholarship in 4 years of study.

Achievement: 26th out of 2111 students of 2020 convocation.

HONOURS AND AWARDS

[07/2024] **Intra-university University Hackathon Winner (at UdS) Awarding institution:** MONA AI

Hackathon Winner | MONA AI @ Saarland University

- **Secured 1st place** in an **intensive 8-hour hackathon** hosted by **MONA AI** at Saarland University and landed the full-time job at **MONA AI**.
- Developed a **working prototype** for Saarland flood detection and rescue system under tight time constraints.

[2016] **Dean's Scholarship (Dean List) Awarding institution:** East West University, Dhaka (Bangladesh)

For maintaining CGPA above 3.80/4.00 (4 being the highest) in three consecutive semesters after each year of study (Summer 2016, Summer 2017, Summer 2018).

[2015] **Full Free Merit Scholarship (2015 - 2019) Awarding institution:** East West University, Dhaka (Bangladesh)

For maintaining GPA 5.00/5.00 (5 being the height) in every subject in both High School and School level board examinations From East West University.

PUBLICATIONS

[2019] **[Symptom-Based Disease Detection System In Bengali Using Convolution Neural Network](#)**

E. Biswas and A. K. Das, "Symptom-Based Disease Detection System In Bengali Using Convolution Neural Network", 2019 7th International Conference on Smart Computing & Communications (ICSCC), Sarawak, Malaysia, Malaysia, 2019, pp. 1-5. doi: 10.1109/ICSCC.2019.8843664

[2020] **Privacy and security perspective on social media – case Facebook [Accepted, ICTIS 2020]**

This research represents an analysis of user's perspectives on their privacy over Facebook, providing an analysis of how privacy policy can be made rigid to the people and lacking.

JOB-RELATED SKILLS

Programming Languages

Most experienced: Scientific Python (7+ years), C (4 years), and C++ (4 years). Other expertise in MatLab, C#, Java, Prolog, Z3.

Web Development Skills: JavaScript, HTML, CSS, Bootstrap, PHP, MySQL.

Other Skills: GCP, Pinecone, RAG, LLMs, *etc.*

LANGUAGE SKILLS

Mother tongue(s): Bengali

Other language(s):

English
LISTENING C1 **READING** C1 **WRITING** C1
SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

German
LISTENING A2 **READING** A2 **WRITING** A2
SPOKEN PRODUCTION A2 **SPOKEN INTERACTION** A2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

ORGANISATIONAL SKILLS

General Secretary of IEEE Computer Society, EWU

I was with the IEEE Student Socicety Computer Science section of East West University (September 2018 - April 2019). I have hosted one programming contest and showed enthusiasm in recruiting members. Experienced leadership and managerial experience through accomplishing successful projects (part of course curriculum).