Tasfia Nuzhat

Generative Models & Diffusion · Large Language Models · Trustworthy & Biomedical AI

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EDUCATION

Ph.D., Industrial Engineering, University of Central Florida Jan 2026 – Present
CGPA: 4.00/4.00. Research in generative diffusion models, LLMs, and trustworthy biomedical AI.

B.Sc., Computer Science & Engineering, Chittagong Independent University Sep 2017 – Sep 2021
Chittagong, Bangladesh.

EXPERIENCE

Graduate Research Assistant, University of Central Florida Jan 2026 – Present

- Develop generative diffusion models for constrained molecule generation and LLM methods for temporal-conflict resolution and safe clinical decision support.

Graduate Teaching Assistant, University of Central Florida Jan 2026 – May 2026

- STA3032 (Probability and Statistics): supported coursework and projects, graded assignments and reports, and advised students during office hours.

AI Engineer (Remote), Delineate Inc., Boston, MA Nov 2023 – Dec 2025

- Built LLM-powered retrieval and extraction systems over pharmaceutical and biomedical literature, combining Retrieval-Augmented Generation (RAG) with domain NLP to surface structured evidence for downstream analysis.
- Developed computer-vision pipelines that digitized figures in scientific PDFs into quantitative data, and applied predictive modeling with explainable-AI methods to clinical datasets for risk-aware decision support.

Graduate Research Assistant, Universiti Tenaga Nasional, Malaysia Dec 2024 – Dec 2025

- Developed predictive machine-learning models for material-property analysis and optimization at the machine-learning/nanomaterials interface; led a Q1 journal review and contributed to peer-reviewed publications and grant preparation.

PUBLICATIONS

Published or accepted; author order as listed, ***Tasfia Nuzhat*** *in bold.*

- NEXUS: Structured Runtime Safety for Tool-Using LLM Agents. E. Hossain, M. M. H. Nipu, **Tasfia Nuzhat**, R. Rana, N. Yousefi. *Accepted in AACL-IJCNLP 2026.*
- A Review on Machine Learning in Photocatalytic Degradation of Organic Dyes from Wastewater: Current Trends and Future Directions. **Tasfia Nuzhat**, N. A. B. Mohamed Radzi, M. Maruthupandy, S. Yussof. *Journal of Water Process Engineering* 78:108760 (Elsevier, Q1, IF 6.7), 2025. [doi]
- R-GAT: Cancer Document Classification Leveraging a Graph-Based Residual Network for Scenarios with Limited Data. E. Hossain, **Tasfia Nuzhat**, S. Masum, S. Rahimi, N. Amiri Golilarz. *Scientific Reports* (Nature Portfolio), 2026. [doi]
- A Multi-Scale Hyper Representation Network for Semantic Segmentation of Pulmonary Circulation Vessels in Pathology Assessment. **Tasfia Nuzhat**, S. Mohanto, A. Iqbal. *IEEE-EMBS IECBES 2024*, Malaysia. [link]
- Artificial Magnetic Conductor Unit Cell Design Using Machine Learning Algorithms. **Tasfia Nuzhat**, M. N. Hasan. *IEEE IEMTRONICS 2022*, Toronto, Canada. [link]
- Microwave Imaging: CPW-Fed Microstrip Patch Antenna with Defected Ground Plane Operating in ISM Band for Breast Tumor Detection. G. K. Dey, **Tasfia Nuzhat**, K. P. Das, F. Ali. *APCC 2022*, South Korea. [link]

PREPRINTS & MANUSCRIPTS UNDER REVIEW

Author order as submitted, ***Tasfia Nuzhat*** *in bold.*

- MotifRole-Diff: Risk-Optimal Role-Aware Corruption for Masked Molecular Graph Diffusion. **Tasfia Nuzhat**, E. Hossain, I. Garibay, N. Yousefi. *Submitted to AAAI 2027.*
- CAREBENCH: When Correct Diagnoses Come from Unsafe Reasoning. E. Hossain, **Tasfia Nuzhat**, S. Roy Dipta, I. Garibay, A. Rivera-Sepulveda, N. Yousefi. *Submitted to AAAI 2027.*
- Right Knowledge, Wrong Answer: Characterizing Parametric Temporal Conflict in Open-Weight Language Models. E. Hossain, S. Saha, **Tasfia Nuzhat**, S. S. Jennifer, U. Biswas, S. Roy Dipta, R. Rana, N. Yousefi. *Submitted to AAAI 2027.* [arXiv]

- ChannelGuard: Safe Models Do Not Compose into Safe Multi-Agent Systems. E. Hossain, M. M. H. Nipu, F. T. J. Faria, **Tasfia Nuzhat**, M. Sheikh. *Submitted to KDD 2027.*
- MedBayes-Lite: A Clinical Uncertainty Governance Layer for Risk-Aware Medical Decision Support. E. Hossain, M. M. H. Nipu, M. Sheikh, **Tasfia Nuzhat**, R. Rana, S. Neupane, B. W. Schuller, N. Yousefi. *Preprint*, arXiv:2511.16625. [arXiv]
- PEFT A2Z: Parameter-Efficient Fine-Tuning Survey for Large Language and Vision Models. N. J. Prottasha, U. Roy Chowdhury, S. Mohanto, **Tasfia Nuzhat**, A. As Sami, M. S. Ali, M. S. I. Sobuj, H. Raman, M. Kowsher, O. O. Garibay. *Preprint (under review)*, arXiv:2504.14117. [arXiv]

Workshops

- MoCDiff: Efficient Motif-Constrained Discrete Diffusion for Molecule Generation. **Tasfia Nuzhat**, M. J. I. Basher, S. K. Mishra, O. Garibay, I. Garibay, N. Yousefi. *ICML 2026 Workshop on Generative & Agentic AI for Biology (GenBio).* [link]

TECHNICAL SKILLS

- **Generative & Deep Learning:** diffusion models (discrete / graph), generative modeling for molecules; large language models, fine-tuning & PEFT (LoRA), RAG; GANs; graph neural networks; computer vision (semantic segmentation, detection, image translation).
- **Trustworthy & Applied ML:** uncertainty quantification, explainable AI; LLM evaluation & safety benchmarking; predictive modeling for clinical and materials-science data.
- **Programming & Tools:** Python, C/C++, JavaScript, SQL; PyTorch, TensorFlow, Hugging Face Transformers; Git.

SERVICE

- Reviewer, ICML 2026 Workshop on Generative & Agentic AI for Biology.
- Reviewer, Neurips 2026 Women in Machine Learning Workshop