

# Tonni Das Jui

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## Personal Goal

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With application-driven research experience in developing machine-learning algorithms, especially for graph tasks, I am enthusiastic about developing robust, scalable models and collaborating with diverse teams.

## Education

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**Baylor University**, Waco, TX, USA: PhD in Computer Science | CGPA: 3.72/4.00 Jan 2021 – Dec 2025 (tentative)  
**Baylor University**, Waco, TX, USA: MSc in Computer Science | CGPA: 3.70/4.00 Jan 2021 – Dec 2023  
**BRAC University**, Dhaka, Bangladesh: BSc in Computer Science | CGPA: 3.76/4.00 Aug 2014 – Jul 2018

## Technical Skills

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**Languages & Frameworks:** Python, Java, SpringBoot, PyTorch, Neo4j, NetworkX, PySpark, Kubernetes  
**Research Expertise:** Graph Attention Models, Graph Neural Networks, Graph Machine Learning

## Research Experiences

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### Benton Lab | Graduate Research Assistant | Jan 2023 – Present

*Dynamic Attention Generative and Topology-aware Graph Embedding for Node Classification*

- **Developed** a new algorithm for node classification through feeding parameterizable graph structures and node features.
- **Achieved 2%** performance gain on various real-world, large-scale graphs in transductive and inductive settings.
- **Outcome:** Tonni Das Jui, Mary Lauren Benton, Erich Baker, “Node classification with structure-aware graph attention network”, Submitted to International Joint Conference on Neural Networks (IJCNN’25).

*Efficient Graph Neural Network Capturing Multi-hopped Information for Classifying Nodes in Homogeneous Graphs*

- **Developed** a **novel** algorithm for efficient convergence and consistent performance through convolving multi-hopped node features and adjacency.
- **Implemented** on real-world homogeneous citation networks and **demonstrated** a consistent performance upgrade.
- **Outcome:** Tonni Das Jui, Mary Lauren Benton, Erich Baker, “Node classification with Multi-hop Graph Convolutional Network”, in *Recent Advances in Next-Generation Data Science*, pp. 199–213, Springer Nature Switzerland, 2024.

*Evolution of graph neural networks (GNNs) from graph embedding techniques*

- **Developed** a taxonomy of embedding techniques from the timeline and architectural similarities perspective and demonstrated how GNN techniques emerged during evolution.
- **Pointed** at recent drive towards attention-based-GNN research and possible scopes for further contribution.
- **Outcome:** Tonni Das Jui, Erich Baker, Mary Lauren Benton, “Evolution of graph embedding trends: A review with potential future directions”, submitted in *IEEE Transactions on Neural Networks and Learning Systems*, 2024.

### Baylor AI Lab | Graduate Research Assistant | May 2021 – Dec 2022

*Robustness and efficacy of quantum classifiers and traditional classifiers*

- **Analyzed** various traditionally hyperparameter-tuned classifiers against implementing them with quantum kernels.
- **Implemented** on separable and largely inseparable data and **analyzed** a performance upgrade for quantum classifiers.
- **Outcome:** Tonni Das Jui, Olawale Ayoade, Pablo Rivas, Javier Orduz, “Performance analysis of quantum machine learning classifiers”, in *LatinX in AI Research at NeurIPS*, 2021.

*Supervised segmentation-based machine learning approach for measuring similarity between sign languages*

- **Developed** an SL segmentation-based approach for efficiently measuring sign language similarity.
- **Implemented** on three large-scale American, Peruvian, and Australian sign language datasets (consisting of multiple dialects).
- **Outcome:** Tonni Das Jui, Gissella Bejarano, Pablo Rivas, “A machine learning-based segmentation approach for measuring similarity between sign languages”, in *Proceedings of the LREC2022 10th Workshop on the Representation and Processing of Sign Languages: Multilingual Sign Language Resources*, 2022.

## Software Project Experiences

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*Bear Go: a platform to send items to known acquaintances and conveniently receive items*

- Identified the use cases and entity relationships and designed the UML diagrams.
- Designed and developed the REST APIs, the backend, unit, and integration tests, and deployed the application in production.
- Implemented JMS and Kafka message system for real-time status update.
- Used: Spring Boot, REST API, React, JPA, OAuth2 authentication, UML, Kafka.
- Repository: <https://github.com/tonnidas/BearGo/tree/main>.

## Recent Publications

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- Fairness issues, current approaches, and challenges in machine learning models,** 2024  
Tonni Das Jui, Pablo Rivas | *International Journal of Machine Learning and Cybernetics*. 15, 3095–3125. Citations: 15
- A machine learning-based segmentation approach for measuring similarity between sign languages,** 2023  
Tonni Das Jui, Gissella Bejarano, Pablo Rivas | *In Proceedings of the LREC2022 10th Workshop on the Representation and Processing of Sign Languages: Multilingual Sign Language Resources*. 94–101. Citations: 9
- From Static Graph Attention Generation to Dynamic Graph Attention Coefficient,** 2024  
Tonni Das Jui, Mary Lauren Benton, Erich Baker | *In Proceedings of the World Congress in Computer Science, Computer Engineering, and Applied Computing (CSCE), 2024*. Citations: 3
- AI ethics for earth sciences (Chapter 15),** 2023  
Pablo Rivas, Christopher Thompson, Brenda Tafur, Bikram Khanal, Olawale Ayoade, Tonni Das Jui, Korn Sooksatra, Javier Orduz, Gissella Bejarano | *Elsevier*. 379-396. Citations: 2
- k-Hopped Link Prediction With Graph Embedding,** 2023  
Tonni Das Jui, Erich Baker, Mary Lauren Benton | *In Proceedings of the World Congress in Computer Science, Computer Engineering, and Applied Computing (CSCE), 2023*. Citations: 2
- Experimental Analysis of Contemporary Trends, Performance, and Limitations in Graph Embeddings: A Concise Review,** 2024  
Tonni Das Jui, Erich Baker, Mary Lauren Benton | *In Proceedings of the World Congress in Computer Science, Computer Engineering, and Applied Computing (CSCE), 2024*.
- Assessing information influence for node attribute prediction,** 2024  
Tonni Das Jui, Erich Baker, Mary Lauren Benton | *In Proceedings of the World Congress in Computer Science, Computer Engineering, and Applied Computing (CSCE), 2024*.