Timothy Pasaribu

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TECHNICAL SKILLS

Programming Languages: Python, Java, C++, SQL (PostgreSQL), R, Bash
ML/DL Frameworks: PyTorch, TensorFlow, Scikit-learn, Keras, Hugging Face Transformers, XGBoost, LightGBM
Data Tools & Libraries: Pandas, NumPy, Matplotlib, Seaborn, OpenCV, SpaCy, NLTK, BeautifulSoup, NetworkX
MLOps & Dev Tools: Git, Docker, MLflow, DVC, GitHub Actions, VS Code, PyCharm
Cloud & Deployment: Google Cloud Platform, AWS SageMaker, FastAPI, Flask, Streamlit
Scientific & Research Tools: Jupyter, LaTeX, Linux Shell, Colab, Slurm

EDUCATION

University of Toronto   Toronto, ON
B.Sc. (Hons) Data Science and Computer Science   *Sept 2022 – Jun 2026*

- CGPA: 3.87/4.00
- Coursework: Introduction to Visual Computing, Software Design (Java), Introduction to Computer Science, Introduction to Data Science, Advanced Data Structures and Algorithms, Introduction to Machine Learning, Programming on the Web, Introduction to Database, Methods of Data Analysis I

EXPERIENCE

NLP Research Assistant   Jan 2025 – Present
University of Toronto   *Toronto, ON*

- Developing advanced NLP methodologies utilizing Large Language Models (LLMs) to analyze and extract moral trait indicators from fictional character narratives.
- Implementing and optimizing deep learning models for text analysis using Python, transformers, and contextual embeddings to process large-scale literary datasets.
- Designing and implementing efficient data pipelines for preprocessing and feature extraction from text corpora, utilizing NLTK, spaCy, and HuggingFace libraries for scalable text processing.
- Collaborating with research team to design and evaluate novel approaches for character-based moral inference, contributing to the intersection of computational linguistics and moral psychology.

Teaching Assistant - STA130   Sep 2024– Dec 2024
University of Toronto   *Toronto, ON*

- Delivered comprehensive tutorial sessions to a class of 24 students, simplifying complex statistical and data science concepts through hands-on examples and interactive discussions.
- Assisted students in understanding key course topics such as descriptive statistics, hypothesis testing, data visualization, and linear regression using statistical tools and Python.
- Provided one-on-one guidance during office hours, fostering a supportive learning environment and helping students resolve course-related challenges.
- Collaborated closely with the course instructor and fellow teaching assistants to prepare and grade homework assignments, ensuring consistency and clarity in assessments.

Machine Learning Intern   May 2024 – Aug 2024
Bank Negara Indonesia   *Jakarta, Indonesia*

- Utilized large language models (LLMs) like BERT and Llama3 for the mobile banking app's personalization feature, leveraging web scraping of social media data to create tailored user experiences and boost engagement.
- Deployed machine learning models via AWS SageMaker to ensure scalable and efficient implementation, optimizing transaction categorization for the financial planning feature.
- Collaborated with cross-functional teams to integrate machine learning solutions into production, analyzing model performance and continuously refining algorithms to ensure accuracy and scalability
- Conducted sentiment analysis using LLMs on customer feedback, enabling actionable insights to improve customer satisfaction and service offerings.

PROJECTS

Scriptorium - Full-Stack Code Editor Platform | *Next.js, React, Docker, TailwindCSS*   Sept 2024 - Nov 2024
- Developed a full-stack web application using Next.js and React that enables users to write, execute, and share code in multiple programming languages (Python, Java, C++, C, JavaScript), with features for real-time code execution and syntax highlighting.
- Implemented RESTful APIs using Next.js for user authentication (JWT), code template management, and social features including blog posts and commenting system, with proper security measures and data validation.
- Built responsive UI components using TailwindCSS with dark/light theme support and designed secure isolated code execution environment using Docker containers for resource management.

Offensive Tweet Classification | *Python, NLP, Machine Learning*   Mar 2024 - May 2024
- Collected and preprocessed large-scale Twitter datasets, applying text normalization, tokenization, and stopword removal to enhance classification accuracy.
- Engineered features using TF-IDF, Word2Vec, and BERT embeddings to improve text representation and capture nuanced linguistic patterns.
- Developed and fine-tuned a transformer-based classification model to detect offensive speech, achieving an F1-score of 85.4% on benchmark datasets.
- Evaluated model performance using confusion matrices, ROC-AUC, and precision-recall metrics to ensure fairness and robustness across diverse inputs.

Credit Risk Prediction Model | *Python, Machine Learning, GPU Computing*   Sept 2024 - Nov 2024
- Developed a GPU-accelerated credit risk assessment system using ensemble methods and gradient boosting techniques, achieving 80.3% accuracy in predicting loan default probabilities.
- Engineered novel features using anomaly detection algorithms and implemented robust preprocessing techniques including handling class imbalance and missing value imputation.
- Evaluated model performance using ROC-AUC and Precision-Recall metrics, demonstrating that gradient boosting achieves superior results while requiring only 10% of the estimators when using engineered features.

Indonesian ID Recognition | *Tensorflow, Python, Streamlit*   Mar 2024 – Jun 2024
- Developed and trained convolutional neural networks using ResNet and VGG16 as base models with TensorFlow and PyTorch to accurately recognize and extract information from Indonesian ID cards (KTP).
- Built a robust data augmentation pipeline using NumPy to increase training dataset diversity and enhance model generalization.
- Achieved high recognition accuracy through extensive fine-tuning and testing of the CNN model.

Ngechat | *Java, Swing, JSONBin.io*   Oct 2023 – Dec 2023
- Implemented real-time messaging, user authentication, and contact management, ensuring a seamless communication platform.
- Mastered version control with Git and GitHub for effective collaboration and code management.
- Contributed to successful project completion, enhancing teamwork and collaborative software development skills.
- Integrated the JSONBin API for external data storage, enhancing scalability and data management capabilities.

Capstone Project: Transients and Supernovae | *R*   Feb 2023 – April 2023
- Leveraged the power of the R programming language to analyze the PLASTiCC (Photometric LSST Astronomical Time-Series Classification Challenge) data set.
- Conducted extensive statistical analyses on astronomical data, focusing on models 15: TDE and 62: SNIbc
- Applied various statistical methods and features, including confidence interval estimation, 2-group hypothesis testing, and linear regression, using R
- The results of these analyses provided valuable insights into the characteristics and dynamics of SNIbc and TDE objects, contributing to the advancement of future research in this field.

ORGANIZATION

Head of Research and Strategic Organization
Aug 2024– Present

PERMIKATO – Indonesian Students Organization in Toronto
Toronto, ON

- Lead and oversee research initiatives to drive strategic planning and organizational development within PERMIKATO, focusing on enhancing the academic and professional growth of Indonesian students.
- Coordinated with team members to design and execute projects that support the academic and career aspirations of members, ensuring alignment with PERMIKATO's mission and goals.
- Managed and analyzed registration data from the 2023 welcoming event and incoming student data for the 2024 academic year to identify trends and inform strategic decisions.

Project Associate
Sep 2023– Present

Students in Data Science and Statistics (SDSS) U of T
Toronto, ON

- Collaborating on a project with ADA Analytics, a Vancouver-based startup, to develop a robo-advisor app for optimizing trading decisions.
- Contributed to building a sophisticated forecasting model, delivering valuable insights and recommendations to enhance user buy/sell decisions and improve trading outcomes.
- Demonstrated a data-driven approach to optimizing decision-making processes, staying at the forefront of data science advancements and applying them in real-world fintech solutions.

AWARDS

Indonesia Maju Scholarship
Aug 2022– Present

Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia
Toronto, ON

Granted a distinguished four-year full-tuition scholarship by the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia. This scholarship, exclusively conferred upon National Science Olympiad medallists and high-achieving students with outstanding academic records in high school, underscores my unwavering commitment to academic excellence and demonstrates my dedication to advancing scholarly pursuits.

Dean's List Scholar
2023-2024

University of Toronto
Toronto, ON

Awarded for achieving a GPA higher than 3.5 during the academic year 2023-2024.