Thasanka Kandage

thasanka@ualberta.com — github.com/ThasankaK — linkedin.com/in/thasanka-kandage

Education

University of Alberta **Edmonton, AB**
Computer Software Engineering, BSc Co-op *Sept 2021 - Apr 2026*

Experience

Undergraduate Research Assistant **Edmonton, AB**
University of Alberta - Renewable Thermal Laboratory *Aug 2024 - Present*

- Implemented multi-objective optimization for storage efficiency and temperature uniformity of a liquid-based volumetric solar thermal receiver using genetic algorithms and MATLAB
- Developed a Physics-Guided Neural Network to predict experimental outputs of a volumetric solar receiver by integrating theoretical outputs from a physics model with the system input features
- Created an extensive dataset by collecting experimental and simulation data with Python scripts, and transforming it into a structured format to enhance readability and ensure compatibility with machine learning algorithms using Pandas

Machine Learning Engineer **Lethbridge, AB**
Hub for Neuroengineering Solutions *Jan 2024 - Aug 2024*

- Applied and tested CNN and Vision Transformer models for object detection and tracking, achieving a mAP@50-95 of 93%
- Built an annotation tool using active and transfer learning, cutting annotation time. It uses a model to help in annotation, and can instantly retrain for faster model convergence and generalization
- Utilized unsupervised learning methods, specifically data clustering of image feature spaces using t-SNE, DBScan, and Convex hulls, to identify diverse images, improving data selection and training quality
- Prepared monthly shareholder updates to communicate project milestones, model performance, and key recommendations

Projects

Software Team Member **Edmonton, AB**
University of Alberta - Robomaster *Sept 2024 - Present*

- Created a Python program using OpenCV and ROS for the retrieval of camera calibration parameters
- Constructed an auto-aiming algorithm using computer vision techniques to determine 3D target positioning

NBA Game Prediction Model

- Developed a binary classification model and tested three different algorithms: SVMs, Balanced Random Forest Classifiers, and Neural Networks. Achieved an F1 score of 62% and made use of grid search for hyperparameter tuning
- Executed extensive feature engineering and data preprocessing, including cleaning, feature selection, and creating rolling average features (5, 10, 25 games) as inputs to the model

UFC Dataset and Fight Prediction Model

- Scraped 4,000+ personal fighter stats, 650+ event records, and 7,500+ fight stats from the official UFC website using BeautifulSoup
- Constructed and tested various machine learning algorithms, such as Neural Networks, Random Forest Classifiers, SVMs, and XGBoosts for predicting fight outcomes, utilizing grid search and bayesian optimization for fine-tuning
- Performed data preprocessing and exploratory data analysis to identify key data relationships for feature selection

AI Sudoku Solver

- Built a Convolutional Neural Network for digit detection, automating number extraction from Sudokus
- Demonstrated proficient knowledge in computer vision techniques such as contour detection, blurring, thresholding, perspective warping, and histogram equalization for image preprocessing
- Designed a Sudoku solving algorithm using a recursive backtracking approach

Path Planning Team Member **Edmonton, AB**
EcoCar Autonomous Programming Competition *Feb 2022 - March 2022*

- Collaborated with team members to research and test path planning algorithms, such as Dijkstra's and RRT
- Developed and deployed a user-friendly tool for quick and accurate coordinate retrieval based on distances

Technical Skills

Languages: Python, MATLAB, SQL, Java, C/C++, R, Rust, Assembly, JavaScript, HTML/CSS

Developer Tools: GitHub, Firebase, MongoDB, Docker, GCP, Kubernetes, AWS SageMaker, Azure AI, Tableau, PowerBI

Libraries: Pandas, NumPy, OpenCV, PyTorch, TensorFlow, scikit-learn, Matplotlib, CUDA, seaborn, BeautifulSoup, PyQt