# Thasanka Kandage

tkandage.com - 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

**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 XGBoost 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

**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
- Performed extensive feature engineering and preprocessing, including data cleaning, feature selection, and developing rolling averages (5, 10, and 25 games) as input features for the model

**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