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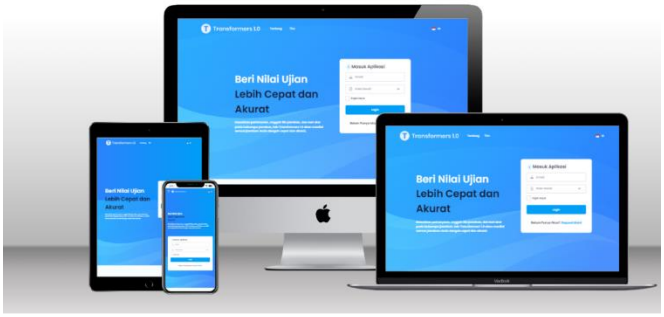
Portfolio Projects

Transformers 1.0: Automated Essay Scoring using Deep Learning and IndoBERT Embedding

Feb 2022 — Aug 2022



- Developed an Automated Essay Scoring (AES) system using 12 different datasets and 18 deep learning models (CNN, RNN, LSTM, GRU, Attention Mechanism) with IndoBERT for word embeddings.
- Implemented hyperparameter tuning using Bayesian optimization to enhance model performance, achieving an average **QWK (Quadratic Weighted Kappa)** score of **0.451** and a **loss (MSE)** of **0.04** during testing
- Developed a web application named "Transformers 1.0" using Flask and TensorFlow, incorporating the best-performing model to provide automated essay scoring with user login and registration features.
- **Technologies used**: Python, Pandas, Numpy, Matplotlib, Seaborn, Scikit-learn, Keras, TensorFlow, Flask, Hugging Face, Transformers, BERT.
- **Publication Link**: https://doi.org/10.24507/icicelb.14.10.1001

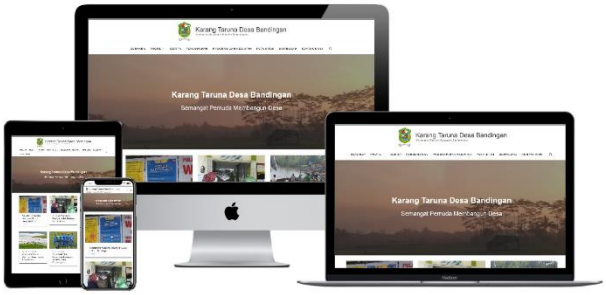
In Apps

Mar 2019 — Aug 2021

- In Apps is an Android application of In Corporation startup, which is a startup that provides online services such as rental, design, printing, and installation through an Android application (InApps).
- **Technologies used**: Android Studio, Kotlin Programming Language, Object-oriented Programming, Material Design, Firebase Auth, Firebase Firestore, Firebase Storage, Firebase Crashlytics, Room Database, Preference Library, Glide, Lottie
- **GitHub Link**: https://github.com/LinggarM/InApps

Website Karang Taruna Desa Bandingan

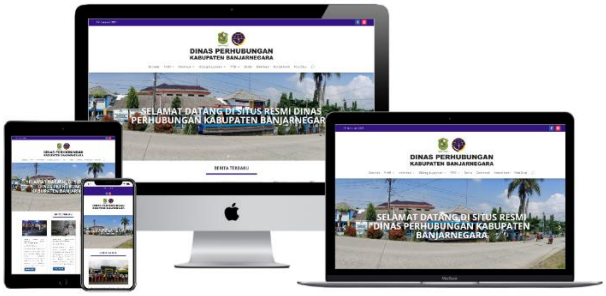
Jul 2020 - Aug 2020



- The Karang Taruna Desa Bandingan website serves as the branding platform for the Karang Taruna (Youth Organization) of Desa Bandingan. Its primary purpose is to fulfill the information needs of the Desa Bandingan community, particularly related to the activities of the youth in the village.
- **Technologies used**: Apache Web Server, CMS WordPress, PHP, MySQL (phpMyAdmin)
- **GitHub Link**: https://github.com/LinggarM/Website-Karang-Taruna-Desa-Bandingan

Website Resmi dan Sistem Uji KIR Dinas Perhubungan Kabupaten Banjarnegara

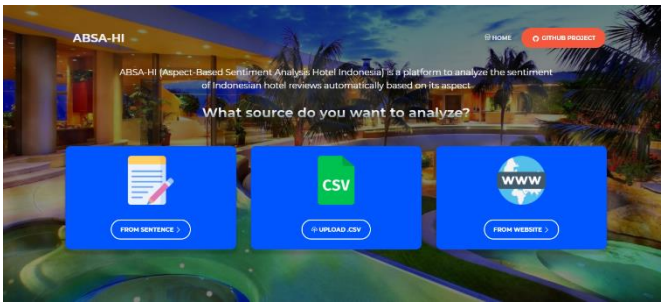
Jan 2020 — Feb 2020



- Developed official website & vehicle inspection registration system for Dinas Perhubungan Banjarnegara Regency during internship. Implemented Waterfall methodology and LAMP stack.
- **Technologies used**: HTML, CSS, Bootstrap (CSS Framework), SB Admin 2 (from Bootstrap), Javascript, PHP, MySQL (phpMyAdmin), Apache Web Server, CMS WordPress, DIVI (Theme Plugin)
- **Website Link**: https://dinhub.banjarnegarakab.go.id/
- **GitHub Link**: https://github.com/LinggarM/Sistem-Uji-KIR-Dinhub-Banjarnegara

Aspect-Based Sentiment Analysis on Indonesian Language Hotel Reviews using Long Short-Term Memory (LSTM) with an Attention Mechanism

2022



- Conducted sentiment analysis on Indonesian hotel reviews focusing on five aspects ("food," "room," "service," "location," and "other") with three sentiment polarities (positive, negative, and neutral) by utilizing LSTM and Attention Mechanism to detect aspects and setiments, as well as Word2vec as word embedding.
- Achieved a **micro-averaged F1-measure** of **0.7628** from the best model.
- Built a web application with Flask and TensorFlow, integrating the best-performing model from experiments.
- **Technologies used**: Python, Pandas, Numpy, Matplotlib, Seaborn, Scikit-learn, Keras, TensorFlow, Flask, NLTK, Sastrawi, Wordcloud, Requests, BeautifulSoup, Selenium.
- **Publication Link**: https://doi.org/10.1007/978-3-031-15191-0_11

News Category Classification using TF IDF Vectorizer and Multinomial Naive Bayes

2022

- Developed a news article classifier with **86.55% accuracy**: Utilized TF-IDF Vectorizer for word embedding and Multinomial Naive Bayes algorithm to categorize news articles into 20 distinct categories.
- **Technologies used**: Python, Pandas, Numpy, Matplotlib, Seaborn, Scikit-learn
- **GitHub Link**: https://github.com/LinggarM/News-Category-Classification-using-TF-IDF-Vectorizer-and-Multinomial-Naive-Bayes

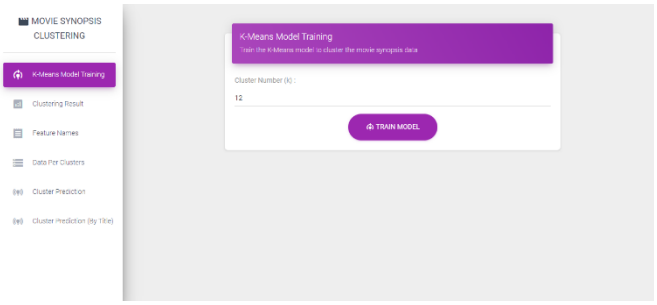
Text Summarization using TF IDF Vectorizer

2022

- Developed a Text Summarization application using NLTK for text preprocessing and TF-IDF Vectorizer for word embedding, enabling automatic generation of concise summaries from various text sources (articles, documents, etc.)
- **Technologies used**: Python, Scikit-learn, NLTK (Natural Language Toolkit)
- **GitHub Link**: https://github.com/LinggarM/Text-Summarization-using-TF-IDF-Vectorizer

Movie Synopsis Text Clustering

2021



- Conducted Text Clustering of Movie Synopses using TF-IDF Vectorizer for word embedding and K-Means Clustering to categorize movie synopsis data into distinct clusters.
- Developed a web application using Flask that integrates a clustering model and offers a film recommendation feature based on user-inputted movie titles or synopses.
- **Technologies used**: Python, Pandas, Numpy, Matplotlib, Seaborn, Scikit-learn, Wordcloud, Requests, Flask
- **GitHub Link**: https://github.com/LinggarM/Movie-Synopsis-Text-Clustering

Covid-19 Tweets Classification

2021

- Developed a Covid-19 tweet classifier with **92.86% accuracy**, utilizing TF-IDF Vectorizer for word embedding and Multinomial Naive Bayes to categorize tweets into 3 classes: "Vaccine," "Prevention & Treatment," and "Indonesia's Covid Developments."
- **Technologies used**: Python, Pandas, Matplotlib, Seaborn, Scikit-learn, Sastrawi, Tweepy
- **GitHub Link**: https://github.com/LinggarM/Covid-19-Tweets-Classification

Poultry Meat Freshness Classification with Transfer Learning using ResNet

2021

- Developed a poultry meat freshness classifier with **95.67% accuracy** by leveraging Residual Networks (ResNet) and transfer learning with pre-trained ImageNet weights for image classification.
- Achieved high accuracy through hyperparameter tuning with different epochs, learning rates, and momentum to achieve top performance.
- **Technologies used**: Python, Numpy, Pandas, Matplotlib, Scikit-learn, Keras, Tensorflow
- **GitHub Link**: https://github.com/LinggarM/Poultry-Meat-Freshness-Classification-with-Transfer-Learning-using-ResNet

Dog vs Cat Classification with Transfer Learning using VGG16

2021

- Developed a Dog vs. Cat Image Classifier (binary image classification) using Transfer Learning (pre-trained VGG16 on ImageNet) achieving a **94% accuracy** rate.
- **Technologies used**: Python, Numpy, Pandas, Matplotlib, Scikit-learn, Keras, Tensorflow
- **GitHub Link**: https://github.com/LinggarM/Dog-vs-Cat-Classification-with-Transfer-Learning-using-VGG16

Ensemble Learning Comparison on Diabetes Classification

2021

- Compared ensemble learning techniques (Random Forest, AdaBoost, Gradient Boosting, etc) for diabetes classification on 3 datasets
- Achieved highest accuracies: **81.82%** (Gradient Boosting, XGBoost, CatBoost) on Dataset 1, **99.25%** (LightGBM) on Dataset 2, and **100%** (LightGBM, CatBoost) on Dataset 3. (LightGBM = Light Gradient Boosting, XGBoost = Extreme Gradient Boosting)
- **Technologies used**: Python, Pandas, Matplotlib, Seaborn, Scikit-learn, xgboost, lightgbm, catboost
- **Publication Link**: https://doi.org/10.14710/jmasif.13.1.42912
- **GitHub Link**: https://github.com/LinggarM/Ensemble-Learning-Comparison-on-Diabetes-Classification

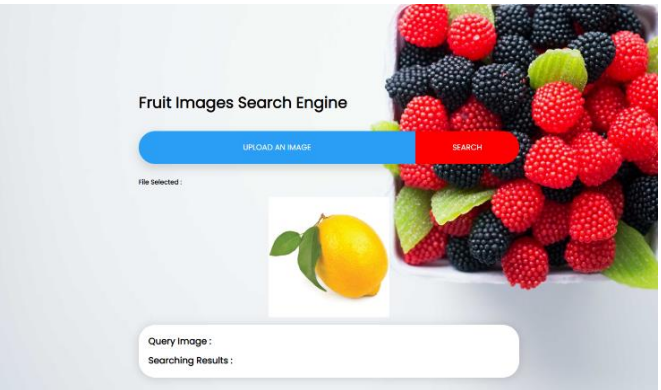
Pima Indians Diabetes Classification

2021

- Performed binary classification for Pima Indians Diabetes prediction using supervised machine learning. Achieved highest accuracy (**81.25%)** with Gradient Boosting Classifier on standardized data.
- **Technologies used**: Python, Pandas, Matplotlib, Seaborn, Scikit-learn, vecstack
- **GitHub Link**: https://github.com/LinggarM/Pima-Indians-Diabetes-Classification

Fruit Images Search Engine

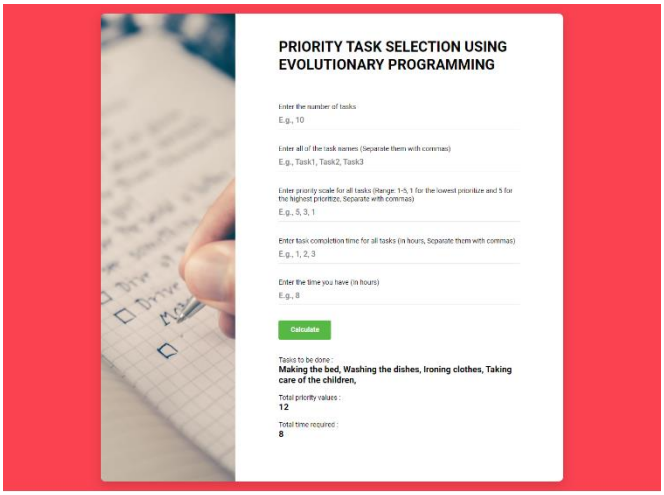
2020



- Developed a web-based Content-Based Image Retrieval (CBIR) program for fruit images using Information Retrieval principles.
- Allows users to search for the most similar fruit images based on an uploaded image.
- **Technologies used**: HTML, CSS, Javascript, Python, Numpy, Tensorflow, Pillow, Flask.
- **GitHub Link**: https://github.com/LinggarM/Fruit-Images-Search-Engine

Priority Task Selection Using Evolutionary Programming

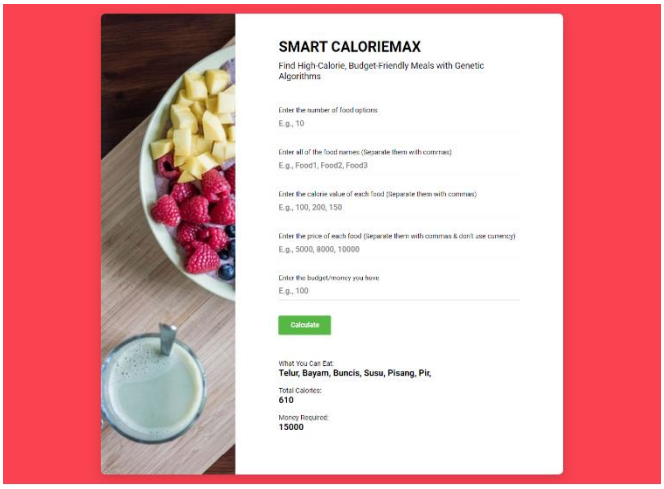
2020



- Developed a web application using Evolutionary Programming for task prioritization.
- Utilizes Evolutionary Programming to determine and prioritize tasks based on available time.
- **Technologies used**: HTML, CSS, Javascript, Python, Numpy, Flask.
- **GitHub Link**: https://github.com/LinggarM/Priority-Task-Selection-Using-Evolutionary-Programming

Smart CalorieMax: Find High-Calorie, Budget-Friendly Meals with Genetic Algorithms

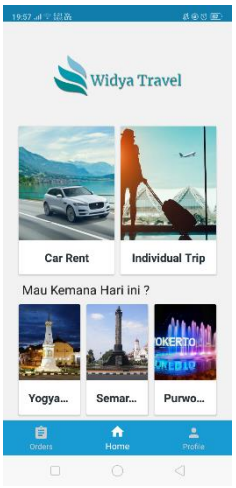
2020



- Developed a web application using Genetic Algorithm for optimizing food selection based on calorie content and budget.
- Utilizes Genetic Algorithm to generate a list of foods with the highest calorie content within specified budget constraints.
- **Technologies used**: HTML, CSS, Javascript, Python, Numpy, Flask, Genetic Algorithms.
- **GitHub Link**: https://github.com/LinggarM/Smart-CalorieMax

Widya Travel

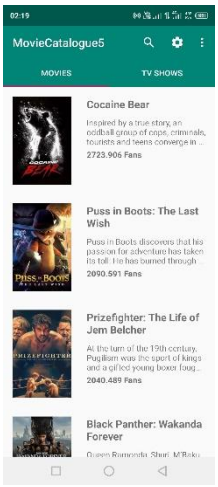
2019



- Widya Travel is an Android application from a travel agency with the same name that provides travel booking & car rental services using an Android application that covers orders from Central Java and surrounding areas.
- **Technologies used**: Android Studio, Java Programming Language, Object-oriented Programming, Volley (Networking Library), Glide, PHP, MySQL, SB Admin 2 (from Bootstrap)
- **GitHub Link**: https://github.com/LinggarM/Widya-Travel

Movie Catalogue

2019



- Movie Catalogue is an Android application that presents a curated list of currently showing Movies and TV Shows with detailed information. Notable features include the ability to manage Favorite Movies and TV Shows, change language preferences, search using keywords, and add a convenient home screen widget.
- **Technologies used**: Android Studio, Java Programming Language, Object-oriented Programming, API from The Movie Database (TMDB), AsyncHttpClient (Networking Library), Glide, SQLite, Fragment, RecyclerView, Intent, AppWidgetProvider, AlarmManager
- **GitHub Link**: https://github.com/LinggarM/MovieCatalogue