

Project

Project Progress Report as of 11/16

CS410 Text Information Systems

Fall 2023

Project Team

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What tasks have been completed?

- ✓ Finalized project objective to “*Leaderboard Competition Creation using Natural Language Processing with disaster tweets dataset.*”
- ✓ Completed design specification and project plan tasks to execute below:
 - Configure Leaderboard using *LiveDataLab*.
 - Connect project GitHub to Leaderboard in *LiveDataLab*.
 - Establish approach to compare models using a common evaluation criterion accurately and fairly.
 - Identify a list of NLP models to evaluate.
 - Start with OkapiBM25 – *review results, pros, and cons.*
 - Evaluate K-means clustering – *review results, pros, and cons.*
 - Evaluate LDA – *review results, pros, and cons.*
 - Evaluate LSA / PLSA – *review results, pros, and cons.*
 - Evaluate out-of-the-box APIs (e.g., *TextBlob*) – *review results, pros, and cons.*
 - Evaluate SciPy’s pre-built NLP packages – *review results, pros, and cons.*
 - Provide Conclusion and Final Recommendation
 - Document Final Project Report
- ✓ Configured Github repository – added documentation for project proposal.
- ✓ Identified Kaggle’s [Natural Language Processing with Disaster Tweets](#) to predict which tweets are about real disasters and which are not.
- ✓ Configured initial Leaderboard in *LiveDataLab*.
- ✗ Attempted to connect our project GitHub repo to Leaderboard in *LiveDataLab* by using previously developed code in MP 2.2.
 - TA’s *Mu-Chun Wang* and *Yuxiang Liu* provided guidance to not pursue this integration to *LiveDataLab* – due to complexities in implementation.
 - The project team have incorporated their feedback to establish a baseline score and train and validate several NLP models against the baseline to beat the baseline.

- Requested *Mu-Chun Wang* to delete the initial Leaderboard created.
- ✓ Developed approach to compare classifier models using a common evaluation criterion accurately and fairly in python. Configured the following helper functions:
 - *load_and_preprocess_data (csv_path)*
 - *load_model (model_path, class_name)*
 - *evaluate_model (model, X_test, y_test)*
 - *Leverage sklearn metrics for accuracy, precision, recall, and F1 score*
- ✓ Deployed a baseline and 4 additional classifier models from *sklearn* toolkit.
 - Logistic Regression Model (*baseline*)
 - Decision Tree Classifier Model
 - K-Neighbors Classifier Model
 - Gaussian Naïve Bayes Model
 - Evaluate Gradient Boosting Classifier Model
- ✓ Document Project Progress Report (this document).

What tasks are pending?

- Evaluate Support Vector Classification Models – *review results, pros, and cons.*
- Evaluate LDA – *review results, pros, and cons.*
- Evaluate LSA / PLSA – *review results, pros, and cons.*
- Evaluate out-of-the-box APIs (e.g., *TextBlob*) – *review results, pros, and cons.*
- Evaluate SciPy's pre-built NLP packages – *review results, pros, and cons.*
- Perform Hyperparameter Optimization (HPO) for all approaches.
- Provide Conclusion and Final Recommendation
- Document Final Project Report

Are you facing any challenges?

- The team was struggling to connect the project GitHub repo to a Leaderboard in LiveDataLab – were looking for example code and documentation.
 - No longer an issue as advised by *Mu-Chun Wang* and *Yuxiang Liu*.
- The team is now unblocked to continue evaluating NLP models against our dataset.