Stakeholder feedback analysis: Detecting stance for text with multiple targets

Git repo: https://github.com/dasenath/Stakeholder-Matrix-Dissertation

Given problem statement: Interpreting the stances of stakeholders on issues within the arena of a legislative proposal.
Key issue identified: Position papers published by stakeholders in response to draft legislation discuss multiple issues and are very long texts.
Proposed aim: Build a stance detection model with the ability to detect multiple stances the author takes within the scope of one position paper.
Proposed and developed solution:

- Critically analysed and drew insights from the papers *Mohammad et al. (2016a), Mohammad et al. (2016b), Li et al. (2021), and Chen, Xi, and Zhou (2020)* for the project which aided in achieving a F_{macro} score of 52.4
- Proposed an approach that extracts issue-specific opinion, thereby breaking down multi-target text into a single-target text
- Handled class imbalance by building a pipeline containing multiple classifiers and data augmentation techniques like back-translation and synonym replacement
- Used T-SNE to visualise the embedding vectors in 2D space, which help in the hyperparameter selection process
- Used multi-tasking DL models in an attempt to generalise the model while forcing it to focus on all the classes
- Experimented with loss functions like “Categorical Focal loss”

Skills used: Requirement elicitation, requirement analysis, stakeholder engagement, strategic decision-making, project planning, ML and DL, Python

References:

Mohammad, S., Kiritchenko, S., Sobhani, P., Zhu, X. and Cherry, C. (2016a) ‘A dataset for detecting stance in tweets’ (from Proceedings of the Tenth International Conference on Language Resources and Evaluation (LREC'16), Portorož, Slovenia, May, 2016), European Language Resources Association (ELRA), pp. 3945-3952. Available at: https://aclanthology.org/L16-1623

Mohammad, S., Kiritchenko, S., Sobhani, P., Zhu, X. and Cherry, C. (2016b) ‘Semeval-2016 task 6: Detecting stance in tweets’ (from Proceedings of the 10th international workshop on semantic evaluation (SemEval-2016), San Diego, California, 16-17 June, 2016), Association for Computational Linguistics, pp. 31-41. Available at: 10.18653/v1/S16-1003

Li, Y., Sosea, T., Sawant, A., Nair, A. J., Inkpen, D. and Caragea, C. (2021) ‘P-stance: A large dataset for stance detection in political domain’, Findings of the Association for Computational Linguistics: ACL-IJCNLP 2021, pp. 2355-2365.

Chen, C., Xi, W. and Zhou, B. (2020) ‘Multi-Target Stance Detection with Multi-Task Learning’ (from Proceedings of the 2020 9th International Conference on Computing and Pattern

Recognition, Xiamen, China, 30 Oct – 1 Nov, 2020), Association for Computing Machinery, pp. 111-116. Available at: https://doi.org/10.1145/3436369.3436473