RESEARCH STAY WEEK 11, 0 Transfer learning for emotion detection

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► CONTEXT 💢

When dealing with small datasets, using transfer learning and auxiliary data provides a significant boost to performance. Lots of low frequency data seems better that few high frequency data. This is specially useful for emotion detection tasks since labeling incurs a very high cost.

SEARCH METHODOLOGY

The readings gave us context for transfer learning and emotion detection separately. I wanted to know more about how the two work together and their pros and cons. That is why i looked for transfer learning in emotion detection and sentiment analysis in scopus.

Comparison

| Title | Objective | Year | Methodologies / topics covered | Takeaways |
|---|--|------|---|--|
| Transfer Learning | Survey of transfer learning applied in different fields | 2009 | Inductive learning: Inductive transfer, bayesian transfer, hierarchical transfer Reinforcement learning: starting-point methods, imitation methods, hierarchical methods, alteration methods Avoiding negative transfer Task mapping | Transfer learning can provide a new way of collaboration in the field and larger models can be trained for generic, well known tasks which can then be fine tuned for more specialized tasks. Mimicking human learning. |
| Deep Learning for Emotion Recognition on Small Datasets Using Transfer Learning | presents the techniques employed in the team's submissions to the 2015 Emotion Recognition in the Wild contest | 2018 | - Pretrained CNNs: Alexnet, VGG-CNN-M-2048 - Face detection: OpenCVs Viola & Jones | When dealing with small datasets, using transfer learning and auxiliary data provides a significant boost to performance. Lots of low frequency data seems better that few high frequency data. |
| State of the art: a review of sentiment analysis based on sequential transfer learning | Cronological review of transfer learning in different sentiment analysis related tasks. | 2022 | - Transductive transfer: Same task, only labels on source - Inductive transfe: Different tasks, lables in target - Unsupervised: no labels in source or target - Sentiment analysis tasks: Aspect based, multimodal, sarcasm analysis, cross-domain, opinion detection | Pre Trained large language models are quite useful for sentiment analysis tasks, although their integration is not as straightforward. Many times the tasks need to be re-structured so that the knowledge from LLMS can be properly leveraged. Also training sources are a problem since positive or negative alignment of words can change depending on context. |
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BIBLIOGRAFÍA

- [1] Transfer Learning. In E. Soria, J. Martin, R. Magdalena, M. Martinez & A. Serrano, editor, Handbook of Research on Machine Learning Applications. IGI Global.
- [2] Ng, H.-W., Nguyen, V. D., Vonikakis, V., & Winkler, S. (2015). Deep Learning for Emotion Recognition on Small Datasets using Transfer Learning. Proceedings of the 2015 ACM on International Conference on Multimodal Interaction, 443–449. https://doi.org/10.1145/2818346.2830593
- [3] Chan, J.YL., Bea, K.T., Leow, S.M.H. et al. State of the art: a review of sentiment analysis based on sequential transfer learning. Artif Intell Rev 56, 749–780 (2023). https://doi.org/10.1007/s10462-022-10183-8