Lab3

Cuprins:

1. Introduction
2. Related works
3. Feature extraction
4. Datasets
5. Experiments
6. Proposed method
7. Conclusion

Plan:

Ipoteza de lucru: Fine-tuning-ul unor modele neuronale ar putea imbunatati acuratetea detectiei emotiilor in melodii.

Metodologia:

1. Colectare datelor: Baza de date cu melodii etichetate cu emotii, cu feature-uri similare celor de la Spotify API
2. Preprocesarea datelor: Vom folosi un API de la spotify care extrage caracteristici din melodii, dar si o librarie librosa, in general utilizata pentru a analiza semnale audio muzicale.
3. Selectarea modelelor: Vom alege modele de tip LSTM, RNN, intrucat au prezentat o performanta mult mai buna in detectarea emotiilor. Vom folosi SVMs si abordari de regresie pentru a compara performantele.
4. Fine-tuning
5. Setul de date: Vom imparti datele existente in 80-10-10, antrenament, testare, validare.
6. Metrici de evaluare: Acuratete

Abordare originala: Incercarea fine-tuning-ului in speranta obtinerii unei etichetari cat mai apropiata de cea reala

Descrierea experimentelor:

* Parametrizarea, antrenarea fiecarui model in parte (ANNs vs ANNs vs SVMs vs Regression)
* Evaluarea performantei pe acelasi set de date de test
* Analiza datelor: compararea acuratetii fiecarui model asupra setului de date de test
* Limitari

Posibila contributie originala:

* Poate fine-tuning-ul sa obtina o acuratete mai buna a rezultatelor? In cazul in care raspunsul este da, acest lucru ar scoate in evidenta valori esentiale pentru antrenarea modelelor specializate in lucrul cu spectre audio.

Referinte bibliografice

1. Y. -H. Yang, Y. -C. Lin, Y. -F. Su and H. H. Chen, "A Regression Approach to Music Emotion Recognition," in IEEE Transactions on Audio, Speech, and Language Processing, vol. 16, no. 2, pp. 448-457, Feb. 2008, doi: 10.1109/TASL.2007.911513.
2. B. Han, S. Rho, R. B. Dannenberg, and E. Hwang, “SMERS: Music emotion recognition using support vector regression,” in Proc. of the Intl. Society for Music Information Conf., Kobe, Japan, 2009.
3. R. Panda, R. Malheiro and R. P. Paiva, "Novel Audio Features for Music Emotion Recognition," in IEEE Transactions on Affective Computing, vol. 11, no. 4, pp. 614-626, 1 Oct.-Dec. 2020, doi: 10.1109/TAFFC.2018.2820691.
4. Rajesh, Sangeetha, and N. J. Nalini. "Musical instrument emotion recognition using deep recurrent neural network." Procedia Computer Science 167 (2020): 16-25, doi: 10.1016/J.PROCS.2020.03.178
5. Hizlisoy, Serhat, Serdar Yildirim, and Zekeriya Tufekci. "Music emotion recognition using convolutional long short term memory deep neural networks." Engineering Science and Technology, an International Journal 24.3 (2021): 760-767, doi: 10.1016/J.JESTCH.2020.10.009
6. Yang, Yi-Hsuan, and Homer H. Chen. Music emotion recognition. CRC Press, 2011.
7. Panda, R., Redinho, H., Gonçalves, C., Malheiro, R. and Paiva, R.P., 2021, July. How does the spotify api compare to the music emotion recognition state-of-the-art?. In 18th Sound and Music Computing Conference (SMC 2021) (pp. 238-245). Axea sas/SMC Network.
8. Amsterdam, Noah. "Analyzing popular music using Spotify’s Machine Learning Audio Features." (2019).
9. Álvarez, P., J. García de Quirós, and S. Baldassarri. "RIADA: A Machine-Learning Based Infrastructure for Recognising the Emotions of Spotify Songs." (2023). <https://doi.org/10.9781/ijimai.2022.04.002>
10. Liu, Tong, Li Han, Liangkai Ma, and Dongwei Guo. "Audio-based deep music emotion recognition." In AIP Conference Proceedings, vol. 1967, no. 1. AIP Publishing, 2018.
11. Laurier, Cyril, Perfecto Herrera, M. Mandel, and D. Ellis. "Audio music mood classification using support vector machine." MIREX task on Audio Mood Classification (2007): 2-4.
12. Malheiro, Ricardo, Renato Panda, Paulo Gomes, and Rui Pedro Paiva. "Emotionally-relevant features for classification and regression of music lyrics." IEEE Transactions on Affective Computing 9, no. 2 (2016): 240-254.
13. Zhang, Fan, Hongying Meng, and Maozhen Li. "Emotion extraction and recognition from music." In 2016 12th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery (ICNC-FSKD), pp. 1728-1733. IEEE, 2016.
14. Lartillot, Olivier, and Petri Toiviainen. "A Matlab toolbox for musical feature extraction from audio." In International conference on digital audio effects, vol. 237, p. 244. 2007.
15. Thayer, Robert E. The biopsychology of mood and arousal. Oxford University Press, 1990.
16. McFee, Brian, Colin Raffel, Dawen Liang, Daniel P. Ellis, Matt McVicar, Eric Battenberg, and Oriol Nieto. "librosa: Audio and music signal analysis in python." In Proceedings of the 14th python in science conference, vol. 8, pp. 18-25. 2015.