

Aplicación de modelos de lenguaje para la identificación de emociones presentes en twitter durante el periodo de elecciones presidenciales en Colombia 2022

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**Magister en Explotación de Datos y
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por

Juan Jose Iguaran Fernandez



Universidad de Buenos Aires

**Facultad de Ciencias Exactas y Naturales
Departamento de Ciencias de la Computación**

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Resumen

El presente trabajo

Palabras Clave: [aquí van]

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Capítulo 1

Introducción

1.1. Motivación

Este trabajo es importante por que

1.2. Marco Teórico

En [Ekman, 1993] Ekman habla sobre las seis emociones básicas que sirven de base para el estudio.

En el libro [Picard, 2000] Picard da un vistazo general sobre el uso de computadoras para detectar emociones.

En [Ortony et al., 1987] se hace una referencia al relacion que existe entre los estados emocionales y el lexico utilizado.

En [Hatzivassiloglou and McKeown, 1997], [Strapparava et al., 2004] y [Esuli and Sebastiani, 2006] se expande este concepto para elaborar un léxico robusto asociado a emociones.

En [Wiebe, 1994] se plantea que el analisis de sentimiento es un caso particular de analisis de subjetividad.

En [Yu and Hatzivassiloglou, 2003] se plantea un metodo para separar opiniones de hechos.

En [Wilson et al., 2009] se muestra como el contexto de na frase puede camiar el sentimiento de una palabra en particular

En [Pang et al., 2002], [Pang and Lee, 2004], [Dave et al., 2003], [Wilson et al., 2005], [Turney, 2002], [Nasukawa and Yi, 2003], [Kim and Hovy, 2004] y se analiza la detección de sentimiento en el texto

En [Wiebe et al., 2005][Strapparava and Mihalcea, 2008], [Strapparava and Mihalcea, 2007], [Alm et al., 2005],[Aman and Szpakowicz, 2007], [Liu et al., 2003] se puede apreciar como el texto puede ser utilizado para detectar emociones.

Luego, en [Pang et al., 2008] se muestra como los foros de Internet son una fuente de información de l cual se puede extraer valiosa información, entre esos detectar emociones.

En [Read, 2005] se utilizan emoticones en los blogs de internet para detectar sentimiento.

En [Pak and Paroubek, 2010], [Kouloumpis et al., 2011] y en [Go et al., 2009], [Barbosa and Feng, 2010] se aprecia como twitter puede ser usado como fuente para identificar sentimientos positivos, negativos y neutros.

En [O'Connor et al., 2010] se muestra como los sentimientos encontrados en twitter corresponden con resultados de encuestas de opinión.

En [Davidov et al., 2010] se utilizan los hashtags y los emoticones para la clasificación

En [Hasan et al., 2014], [Wang et al., 2012] y en [Roberts et al., 2012] se plantea la clasificación mediante distintos algoritmos de las emociones en los tweets.

En [Mohammad, 2012] se hace uso de los hashtags para identificar emociones y entrenar los modelos.

En [Bollen et al., 2011] se observa la relación entre los eventos sociales, políticos y económicos y las emociones detectadas.

En [Tumasjan et al., 2010] se realiza un análisis de sentimientos durante una campaña política.

En [Vaswani et al., 2017] se desarrollan la técnica de transformers de las cuales bert es un ejemplo

En [Devlin et al., 2018] se desarrolla BERT

En [Acheampong et al., 2021] se hace un recuento de el uso de transformers para detectar emociones

En [Gonzalez et al., 2021], [Huang et al., 2019] se utiliza bert en twitter para detectar emociones

Capítulo 2

Metodología

Capítulo 3

Datos

Bibliografía

- [Acheampong et al., 2021] Acheampong, F. A., Nunoo-Mensah, H., and Chen, W. (2021). Transformer models for text-based emotion detection: a review of bert-based approaches. *Artificial Intelligence Review*, 54(8):5789–5829.
- [Alm et al., 2005] Alm, C. O., Roth, D., and Sproat, R. (2005). Emotions from text: machine learning for text-based emotion prediction. In *Proceedings of human language technology conference and conference on empirical methods in natural language processing*, pages 579–586.
- [Aman and Szpakowicz, 2007] Aman, S. and Szpakowicz, S. (2007). Identifying expressions of emotion in text. In *International Conference on Text, Speech and Dialogue*, pages 196–205. Springer.
- [Barbosa and Feng, 2010] Barbosa, L. and Feng, J. (2010). Robust sentiment detection on twitter from biased and noisy data. In *Coling 2010: Posters*, pages 36–44.
- [Bollen et al., 2011] Bollen, J., Mao, H., and Pepe, A. (2011). Modeling public mood and emotion: Twitter sentiment and socio-economic phenomena. In *Proceedings*

of the international AAAI conference on web and social media, volume 5, pages 450–453.

[Dave et al., 2003] Dave, K., Lawrence, S., and Pennock, D. M. (2003). Mining the peanut gallery: Opinion extraction and semantic classification of product reviews. In *Proceedings of the 12th international conference on World Wide Web*, pages 519–528.

[Davidov et al., 2010] Davidov, D., Tsur, O., and Rappoport, A. (2010). Enhanced sentiment learning using twitter hashtags and smileys. In *Coling 2010: Posters*, pages 241–249.

[Devlin et al., 2018] Devlin, J., Chang, M.-W., Lee, K., and Toutanova, K. (2018). Bert: Pre-training of deep bidirectional transformers for language understanding. *arXiv preprint arXiv:1810.04805*.

[Ekman, 1993] Ekman, P. (1993). Facial expression and emotion. *American psychologist*, 48(4):384.

[Esuli and Sebastiani, 2006] Esuli, A. and Sebastiani, F. (2006). Sentiwordnet: A publicly available lexical resource for opinion mining. In *Proceedings of the Fifth International Conference on Language Resources and Evaluation (LREC’06)*.

[Go et al., 2009] Go, A., Bhayani, R., and Huang, L. (2009). Twitter sentiment classification using distant supervision. *CS224N project report, Stanford*, 1(12):2009.

[Gonzalez et al., 2021] Gonzalez, J. A., Hurtado, L.-F., and Pla, F. (2021). Twilbert: Pre-trained deep bidirectional transformers for spanish twitter. *Neurocomputing*, 426:58–69.

- [Hasan et al., 2014] Hasan, M., Rundensteiner, E., and Agu, E. (2014). Emotex: Detecting emotions in twitter messages.
- [Hatzivassiloglou and McKeown, 1997] Hatzivassiloglou, V. and McKeown, K. (1997). Predicting the semantic orientation of adjectives. In *35th annual meeting of the association for computational linguistics and 8th conference of the european chapter of the association for computational linguistics*, pages 174–181.
- [Huang et al., 2019] Huang, C., Trabelsi, A., and Zaïane, O. R. (2019). Ana at semeval-2019 task 3: Contextual emotion detection in conversations through hierarchical lstms and bert. *arXiv preprint arXiv:1904.00132*.
- [Kim and Hovy, 2004] Kim, S.-M. and Hovy, E. (2004). Determining the sentiment of opinions. In *COLING 2004: Proceedings of the 20th International Conference on Computational Linguistics*, pages 1367–1373.
- [Kouloumpis et al., 2011] Kouloumpis, E., Wilson, T., and Moore, J. (2011). Twitter sentiment analysis: The good the bad and the omg! In *Proceedings of the international AAAI conference on web and social media*, volume 5, pages 538–541.
- [Liu et al., 2003] Liu, H., Lieberman, H., and Selker, T. (2003). A model of textual affect sensing using real-world knowledge. In *Proceedings of the 8th international conference on Intelligent user interfaces*, pages 125–132.
- [Mohammad, 2012] Mohammad, S. (2012). # emotional tweets. In ** SEM 2012: The First Joint Conference on Lexical and Computational Semantics—Volume 1: Proceedings of the main conference and the shared task, and Volume 2: Proceedings of the Sixth International Workshop on Semantic Evaluation (SemEval 2012)*, pages 246–255.

- [Nasukawa and Yi, 2003] Nasukawa, T. and Yi, J. (2003). Sentiment analysis: Capturing favorability using natural language processing. In *Proceedings of the 2nd international conference on Knowledge capture*, pages 70–77.
- [O’Connor et al., 2010] O’Connor, B., Balasubramanyan, R., Routledge, B. R., and Smith, N. A. (2010). From tweets to polls: Linking text sentiment to public opinion time series. In *Fourth international AAAI conference on weblogs and social media*.
- [Ortony et al., 1987] Ortony, A., Clore, G. L., and Foss, M. A. (1987). The referential structure of the affective lexicon. *Cognitive science*, 11(3):341–364.
- [Pak and Paroubek, 2010] Pak, A. and Paroubek, P. (2010). Twitter as a corpus for sentiment analysis and opinion mining. In *Proceedings of the Seventh International Conference on Language Resources and Evaluation (LREC’10)*.
- [Pang and Lee, 2004] Pang, B. and Lee, L. (2004). A sentimental education: Sentiment analysis using subjectivity summarization based on minimum cuts. *arXiv preprint cs/0409058*.
- [Pang et al., 2008] Pang, B., Lee, L., et al. (2008). Opinion mining and sentiment analysis. *Foundations and Trends® in information retrieval*, 2(1–2):1–135.
- [Pang et al., 2002] Pang, B., Lee, L., and Vaithyanathan, S. (2002). Thumbs up? sentiment classification using machine learning techniques. *arXiv preprint cs/0205070*.
- [Picard, 2000] Picard, R. W. (2000). *Affective computing*. MIT press.
- [Read, 2005] Read, J. (2005). Using emoticons to reduce dependency in machine learning techniques for sentiment classification. In *Proceedings of the ACL student research workshop*, pages 43–48.

- [Roberts et al., 2012] Roberts, K., Roach, M. A., Johnson, J., Guthrie, J., and Harabagiu, S. (2012). Empatweet: Annotating and detecting emotions on twitter. In *Proceedings of the Eighth International Conference on Language Resources and Evaluation (LREC’12)*, pages 3806–3813.
- [Strapparava and Mihalcea, 2007] Strapparava, C. and Mihalcea, R. (2007). Semeval-2007 task 14: Affective text. In *Proceedings of the Fourth International Workshop on Semantic Evaluations (SemEval-2007)*, pages 70–74.
- [Strapparava and Mihalcea, 2008] Strapparava, C. and Mihalcea, R. (2008). Learning to identify emotions in text. In *Proceedings of the 2008 ACM symposium on Applied computing*, pages 1556–1560.
- [Strapparava et al., 2004] Strapparava, C., Valitutti, A., et al. (2004). Wordnet affect: an affective extension of wordnet. In *Lrec*, volume 4, page 40. Lisbon, Portugal.
- [Tumasjan et al., 2010] Tumasjan, A., Sprenger, T., Sandner, P., and Welpe, I. (2010). Predicting elections with twitter: What 140 characters reveal about political sentiment. In *Proceedings of the International AAAI Conference on Web and Social Media*, volume 4, pages 178–185.
- [Turney, 2002] Turney, P. D. (2002). Thumbs up or thumbs down? semantic orientation applied to unsupervised classification of reviews. *arXiv preprint cs/0212032*.
- [Vaswani et al., 2017] Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., Kaiser, Ł., and Polosukhin, I. (2017). Attention is all you need. *Advances in neural information processing systems*, 30.

- [Wang et al., 2012] Wang, W., Chen, L., Thirunarayan, K., and Sheth, A. P. (2012). Harnessing twitter”big data”for automatic emotion identification. In *2012 International Conference on Privacy, Security, Risk and Trust and 2012 International Confernece on Social Computing*, pages 587–592. IEEE.
- [Wiebe et al., 2005] Wiebe, J., Wilson, T., and Cardie, C. (2005). Annotating expressions of opinions and emotions in language. *Language resources and evaluation*, 39(2):165–210.
- [Wiebe, 1994] Wiebe, J. M. (1994). Tracking point of view in narrative. *arXiv preprint cmp-lg/9407019*.
- [Wilson et al., 2005] Wilson, T., Wiebe, J., and Hoffmann, P. (2005). Recognizing contextual polarity in phrase-level sentiment analysis. In *Proceedings of human language technology conference and conference on empirical methods in natural language processing*, pages 347–354.
- [Wilson et al., 2009] Wilson, T., Wiebe, J., and Hoffmann, P. (2009). Recognizing contextual polarity: An exploration of features for phrase-level sentiment analysis. *Computational linguistics*, 35(3):399–433.
- [Yu and Hatzivassiloglou, 2003] Yu, H. and Hatzivassiloglou, V. (2003). Towards answering opinion questions: Separating facts from opinions and identifying the polarity of opinion sentences. In *Proceedings of the 2003 conference on Empirical methods in natural language processing*, pages 129–136.