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#14525 Summary

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Title and Abstract

Title	Automatic Assessment of Technology Readiness Level Using LLDA-Helmholtz for Ranking University
Abstract	The assessment process of Technology Readiness Level using the questionnaire-based tool for Indonesian university's academic papers is considered to be labor-intensive. This

paper introduces a new method of determining the TRL of an academic paper based on a text mining technique. The content of the research paper represented by their abstract published by university lecturers is justified to represent the technology maturity of research. Abstracts of papers were collected from the nine most reputable universities in Indonesia. By utilizing Labelled Latent Dirichlet Allocation, the abstracts were categorized into 1 of 9 levels of TRL. To determine the prior label of LLDA, we built a corpus of keywords representing each TRL level based on Bloom Taxonomy. Beforehand, Helmoltz principle was utilized to select the text feature. Since Bloom Taxonomy has only six levels, we split the keywords into 9 level. Afterward, the reputation score is calculated using our formula. Lastly, the university ranking is generated according to the extracted academic reputation score. To evaluate the proposed method, we compare our rank with QS's. We calculate the ranking gap and Pearson correlation to evaluate the result. Helmholtz has successfully pruned 86% of features. The utilization of Helmholtz significantly improves the Pearson correlation of our proposed method. In short, the new insight of university ranking introduced in this work is promising. For all indicator experiments, LLDA-Helmholtz performed better results indicated by 0.95 Pearson correlation between two rankings, while for LLDA without Helmhotz, the correlation is 0.78.

Indexing

Keywords Technology readiness level; labeled latent Dirichlet allocation; Helmholtz principle; bloom taxonomy; Pearson correlation.

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References

References H. P. Nguyen, "Core orientations for 4.0 technology application on the development strategy of intelligent transportation system in Vietnam," Int. J. Adv. Sci. Eng. Inf. Technol., vol. 10, no. 2, pp. 520–528, 2020, doi: 10.18517/ijaseit.10.2.11129.

W. J. Carmack, L. A. Braase, R. A. Wigeland, and M. Todosow, "Technology readiness levels for advanced nuclear fuels and materials development," Nucl. Eng. Des., vol. 313, pp. 177–184, 2017, doi: 10.1016/j.nucengdes.2016.11.024.

M. B. R. Goulart et al., "Technology readiness assessment of ultra-deep Salt caverns for carbon capture and storage in Brazil," Int. J. Greenh. Gas Control, vol. 99, no. July, p. 103083, 2020, doi: 10.1016/j.ijggc.2020.103083.

A. Boretti and S. Al-Zubaidy, "Maturity assessment of the solar updraft tower technology," Renew. Energy Focus, vol. 27, no. 00, pp. 135–144, 2018, doi: 10.1016/j.ref.2018.10.001.

S. H. Kim and S. Il Sung, "Modeling and analysis of the catastrophic failure and degradation data," Microelectron. Reliab., vol. 114, no. July, p. 113764, 2020, doi: 10.1016/j.microrel.2020.113764.

M. Najib and F. Fahma, "Investigating the adoption of digital payment system through an extended technology acceptance model: An insight from the Indonesian small and medium enterprises," Int. J. Adv. Sci. Eng. Inf. Technol., vol. 10, no. 4, pp. 1702–1708, 2020, doi: 10.18517/ijaseit.10.4.11616.

R. F. Beims, C. L. Simonato, and V. R. Wiggers, "Technology readiness level assessment of pyrolysis of trygliceride biomass to fuels and chemicals," Renew. Sustain. Energy Rev., vol. 112, no. June, pp. 521–529, 2019, doi: 10.1016/j.rser.2019.06.017.

S. Badr, J. Y. Yap, J. Tan, M. Janssen, E. Svensson, and S. Papadokonstantakis, Combined basic and fine chemical biorefinery concepts with integration of processes at different technology readiness levels, vol. 43. Elsevier Masson SAS, 2018.

S. O. Essien, I. Udugama, B. Young, and S. Baroutian, "Recovery of bioactives from kānuka leaves using subcritical water extraction: Techno-economic analysis, environmental impact assessment and technology readiness level," J. Supercrit. Fluids, vol. 169, p. 105119, 2021, doi: 10.1016/j.supflu.2020.105119.

N. Erdog˘mu and M. Esen, "An investigation of the effects of technology readiness on technology acceptance in e-HRM," Procedia - Soc. Behav. Sci., vol. 24, pp. 487–495, 2011, doi: 10.1016/j.sbspro.2011.09.131.

J. Straub, "In search of technology readiness level (TRL) 10," Aerosp. Sci. Technol., vol. 46, pp. 312–320, 2015, doi: 10.1016/j.ast.2015.07.007.

K. Ikeda, S. I. Koyama, M. Kurata, Y. Morita, K. Tsujimoto, and K. Minato, "Technology readiness assessment of partitioning and transmutation in Japan and issues toward closed fuel cycle," Prog. Nucl. Energy, vol. 74, pp. 242–263, 2014, doi: 10.1016/j.pnucene.2013.12.009.

P. H. Kobos, L. A. Malczynski, L. T. N. Walker, D. J. Borns, and G. T. Klise, "Timing is everything: A technology transition framework for regulatory and market readiness levels," Technol. Forecast. Soc. Change, vol. 137, no. June, pp. 211–225, 2018, doi: 10.1016/j.techfore.2018.07.052.

Y. Zhang, J. Sun, Z. Yang, and Y. Wang, "Critical success factors of green innovation:

Technology, organization and environment readiness," J. Clean. Prod., vol. 264, p. 121701, 2020, doi: 10.1016/j.jclepro.2020.121701.

V. Jafari-Sadeghi, A. Garcia-Perez, E. Candelo, and J. Couturier, "Exploring the impact of digital transformation on technology entrepreneurship and technological market expansion: The role of technology readiness, exploration and exploitation," J. Bus. Res., vol. 124, no. April 2020, pp. 100–111, 2021, doi: 10.1016/j.jbusres.2020.11.020.

B. S. Rintyarna, R. Sarno, and C. Fatichah, "Evaluating the performance of sentence level features and domain sensitive features of product reviews on supervised sentiment analysis tasks," J. Big Data, vol. 6, no. 1, 2020, doi: 10.1186/s40537-019-0246-8.

B. S. Rintyarna, R. Sarno, and A. L. Yuananda, "Automatic ranking system of university based on technology readiness level using LDA-Adaboost.MH," 2018 Int. Conf. Inf. Commun. Technol. ICOIACT 2018, vol. 2018-Janua, pp. 495–499, 2018, doi: 10.1109/ICOIACT.2018.8350706.

B. S. Rintyarna, R. Sarno, and C. Fatichah, "Semantic Features for Optimizing Supervised Approach of Sentiment Analysis on Product Reviews," MDPI Comput., vol. 8, no. 3, pp. 1–16, 2019.

D. Ramage, D. Hall, R. Nallapati, and C. D. Manning, "Labeled LDA: A supervised topic model for credit attribution in multi-labeled corpora," Proc. 2009 Conf. Empir. Methods Nat. Lang. Process., no. August, pp. 248–256, 2009, doi: 10.3115/1699510.1699543.

I. A. Kautsar and R. Sarno, "A supportive tool for project based learning and laboratory based education," Int. J. Adv. Sci. Eng. Inf. Technol., vol. 9, no. 2, pp. 630–639, 2019, doi: 10.18517/ijaseit.9.2.7067.

R. Navigli and M. Lapata, "An Experimental Study of Graph Connectivity for Unsupervised Word Sense Disambiguation.pdf," IEEE Trans. Pattern Anal. Mach. Intell., vol. 32, no. 4, pp. 678–692, 2010.

B. S. Rintyarna, "Mapping acceptance of Indonesian organic food consumption under Covid-19 pandemic using Sentiment Analysis of Twitter dataset," J. Theor. Appl. Inf. Technol., vol. 99, no. 5, pp. 1009–1019, 2021.

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#14525 Review

Submission

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