## **Supplementary File**

Table 1a: Features selected by the included articles

| Author (year)                            | Words of<br>titles and<br>abstracts | MEDLINE<br>citation<br>metadata* | Bibliometric<br>features <sup>+</sup> | UMLS<br>features‡ | Unique<br>features                                       |
|------------------------------------------|-------------------------------------|----------------------------------|---------------------------------------|-------------------|----------------------------------------------------------|
| Aphinyanapho<br>ngs et al.<br>(2003) [1] | ✓                                   | N/A                              | N/A                                   | N/A               | N/A                                                      |
| Aphinyanapho<br>ngs et al.<br>(2005) [2] | *                                   | N/A                              | N/A                                   | N/A               | N/A                                                      |
| Aphinyanapho<br>ngs et al.<br>(2006) [3] | *                                   | N/A                              | N/A                                   | N/A               | N/A                                                      |
| Kilicoglu et al.<br>(2009) [4]           | ~                                   | ~                                | N/A                                   | ~                 | SemRep<br>semantic<br>predictions                        |
| Lin et al.<br>(2011) [5]                 | N/A                                 | N/A                              | *                                     | N/A               | Sample size, P-<br>value,<br>confidence<br>intervals.    |
| Afzal et al.<br>(2017) [6]               | ~                                   | ~                                | N/A                                   | N/A               | N/A                                                      |
| Bian et al.<br>(2017) [7]                | N/A                                 | ~                                | ~                                     | N/A               | Both time-<br>sensitive and<br>time-agnostic<br>features |
| Del Fiol et al.<br>(2018) [8]            | ~                                   | N/A                              | N/A                                   | N/A               | N/A                                                      |
| Bian et al.<br>(2019) [9]                | N/A                                 | ~                                | ~                                     | N/A               | Time-agnostic<br>features only                           |
| Afzal et al.<br>(2020) [10]              | ~                                   | N/A                              | N/A                                   | N/A               | N/A                                                      |

 $\checkmark$  = applied; N/A = not applied

\* MEDLINE citation metadata are the major elements describing a MEDLINE record as indexed by the National Library of Medicine indexers [11]. They include time-sensitive features such as MeSH terms, and publication type, as well as time-agnostic features, for example, registry in ClinicalTrials.gov and authors' affiliations [9].

<sup>+</sup> Bibliometric features measure the quality of the authors, journals, and institutions [12], such as journal impact factor, and quality of first author's institution [12].

**‡** UMLS, Unified Medical Language System, is developed by the National Library of Medicine and it is a collection of biomedical vocabularies which contains biomedical concepts and relations to be used for computer systems development [13].

## Table references:

- Aphinyanaphongs Y, Aliferis CF. Text categorization models for retrieval of high quality articles in internal medicine. AMIA Annu Symp Proc [Internet] United States; 2003;(101209213):31–35. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med5&NEWS=N&AN=14728128
- Aphinyanaphongs Y, Tsamardinos I, Statnikov A, Hardin D, Aliferis CF. Text categorization models for high-quality article retrieval in internal medicine. J Am Med Inform Assoc [Internet] England; 2005;12(b92, 9430800):207–216. Available from:

http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med6&NEWS=N&AN=15561789

 Aphinyanaphongs Y, Aliferis C. Prospective validation of text categorization filters for identifying highquality, content-specific articles in MEDLINE. AMIA Annu Symp Proc [Internet] United States; 2006;(101209213):6–10. Available from:

http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med6&NEWS=N&AN=17238292

- Kilicoglu H, Demner-Fushman D, Rindflesch TC, Wilczynski NL, Haynes RB. Towards Automatic Recognition of Scientifically Rigorous Clinical Research Evidence. Journal of the American Medical Informatics Association 2009;16(1):25–31. PMID:18952929
- Lin J-W, Chang C-H, Lin M-W, Ebell MH, Chiang J-H. Automating the process of critical appraisal and assessing the strength of evidence with information extraction technology. J Eval Clin Pract [Internet] England; 2011;17(cwd, 9609066):832–838. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med8&NEWS=N&AN=21707873
- 6. Afzal M, Hussain M, Haynes RB, Lee S. Context-aware grading of quality evidences for evidence-based decision-making. Health Informatics Journal 2017;25(2):429–445. PMID:28766402
- Bian J, Morid MA, Jonnalagadda S, Luo G, del Fiol G. Automatic identification of high impact articles in PubMed to support clinical decision making. J Biomed Inform [Internet] United States; 2017;73(100970413, d2m):95–103. Available from:
- http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med14&NEWS=N&AN=28756159
  8. del Fiol G, Michelson M, Iorio A, Cotoi C, Haynes RB. A Deep Learning Method to Automatically Identify Reports of Scientifically Rigorous Clinical Research from the Biomedical Literature: Comparative Analytic Study. Journal of medical Internet research 2018;20(6):e10281. PMID:29941415
- Bian J, Abdelrahman S, Shi J, del Fiol G. Automatic identification of recent high impact clinical articles in PubMed to support clinical decision making using time-agnostic features. J Biomed Inform [Internet] United States; 2019;89(100970413, d2m):1–10. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=medl&NEWS=N&AN=30468912
- 10. Afzal M, Park BJ, Hussain M, Lee S. Deep learning based biomedical literature classification using criteria of scientific rigor. Electronics (Switzerland) 2020;9(8):1–12. [doi: 10.3390/electronics9081253]
- 11. National Library of Medicine. MEDLINE/PubMed Data Element (Field) Descriptions [Internet]. [cited 2021 Nov 6]. Available from: https://www.nlm.nih.gov/bsd/mms/medlineelements.html#ir
- Fu LD, Aliferis CF. Using content-based and bibliometric features for machine learning models to predict citation counts in the biomedical literature. Scientometrics [Internet] 2010 Oct 3;85(1):257–270. [doi: 10.1007/s11192-010-0160-5]
- 13. Butte AJ, Chen D. Translational Bioinformatics for Genomic Medicine. Genomic and Personalized Medicine [Internet] Elsevier; 2013. p. 272–286. [doi: 10.1016/B978-0-12-382227-7.00023-9]