



SOPRONI
EGYETEM |

FAIPARI MÉRNÖKI ÉS
KREATÍVIPARI
KAR

AZ ALKALMAZOTT MŰVÉSZET LÉTMÓDJAI ÉS A KREATÍV IPAR KIHÍVÁSAI NAPJAINKBAN

Faipari Mérnöki és Kreatívipari Kar Tudományos Kiadványa

Szerkesztette: Márfa Molnár László és Pásztory Zoltán



AZ ALKALMAZOTT MŰVÉSZET LÉTMÓDJAI ÉS A KREATÍV IPAR KIHÍVÁSAI NAPJAINKBAN

**FAIPARI MÉRNÖKI ÉS KREATÍVIPARI KAR TUDOMÁNYOS
KIADVÁNYA**

Szerkesztette: Márjai Molnár László és Pásztory Zoltán



SOPRONI EGYETEM KIADÓ

SOPRON, 2023

A kötet első 12 írása a Sopronban 2022. október 28-án *Az alkalmazott művészet létmódjai napjainkban* címmel megrendezett tudományos konferencia előadásainak szerkesztett anyagát tartalmazza.

A konferencia támogatói:

MTA VEAB Soproni Tudós Társaság Művészeti és Irodalomtudományi Szakbizottság

Magyar Tudományos Akadémia VEAB Képzőművészet, Művészetelmélet és Design
Munkabizottság

Soproni Egyetem Faipari Mérnöki és Kreatívipari Kar

Felelős kiadó: Prof. Dr. Fábíán Attila

a Soproni Egyetem rektora

Szerkesztette:

Dr. Márfa Molnár László és Dr. Pásztory Zoltán

Lektorálta:

Dr. Börcsök Zoltán

ISBN 978-963-334-453-8 (pdf)

<https://doi.org/10.35511/978-963-334-453-8>

Creative Commons licenc: BY-NC-SA 2.5



Nevezd meg! Ne add el! Így add tovább! 2.5 Hungary
Attribution – Non commercial – Share Alike 2.5 HUNGARY

Tartalom

Bevezetés.....	5
Művészeti szekció	
Posztmodern performansz.....	7
<i>Szabó Tibor</i>	
Az alkalmazott és az autonóm művészet szakrális alkotásokban.	15
<i>Karikó Sándor</i>	
Szépség és öröm. Gondolatok a hazai kortárs transzcendens művészetről.....	21
<i>Kovács-Gombos Gábor</i>	
A képi világ üzenetei. Két leány folyóirat margójára	30
<i>Fáyné dr. Dombi Alice</i>	
Ökoművészet és öcodesign mint új paradigma?	40
<i>Zalavári József</i>	
Fenntartható létharmónia, esztétikum és a feminin reprezentációja	48
<i>Major Gyöngyi</i>	
Tér(más)kép(pen) - adalékok a kortárs építészeti ábrázolás eszköztárának áttekintéséhez.....	61
<i>Kósa Balázs, Markó Balázs</i>	
Képirás – képolvasás (illúzió és gyakorlat)	70
<i>Gáspárdy Tibor</i>	
A kortárs (alkalmazott) művészet értelmezhetősége.....	80
<i>Márfai Molnár László</i>	
Bepillantás művészet és természettudomány közös metszetébe.....	87
<i>Nagy Máté</i>	
„Ut pictura poesis” Az intermedialitás megjelenési formái Tandori Dezső költészetében	95
<i>Zámbó Bianka</i>	
A soproni műemlék épületek dokumentálásának bemutatása egy helyi példán keresztül.....	102
<i>Kósa Balázs, Markó Balázs, Tárkányi Sándor</i>	
A makett, mint szemléltető eszköz.....	113
<i>Horváth Péter György, Markó Balázs, Tárkányi Sándor, Antal Mária Réka, Kósa Balázs</i>	
A fa élettani hatása	123
<i>Boros Eszter</i>	
Művészet és innováció az információ korában	130
<i>Szécsi Gábor, Szilágyi Tamás</i>	
A térészlelés és térhasználat kognitív működése	145
<i>Mucsi Zsuzsanna Mária, Horváth Péter György</i>	
A design hét megjelenési szintje	152
<i>Reményi Andrea</i>	

Műszaki szekció

Kézi és gépi intarziakészítés összehasonlító elemzése	162
<i>Antal Mária Réka, Horváth Péter György</i>	
Vászonról kompozitig – Anyaghasználat a repülőgépgyártásban.....	178
<i>Zsákai Balázs, Alpár Tibor, Horváth Péter György</i>	
Ütemezési feladat eredményeinek nemparametrikus statisztikai elemzése	185
<i>Tóth Zsolt, Hegyháti Máté, Kulcsár Ernő, Ősz Olivér</i>	
Fenyő rönk és fűrészáru behozatal környezeti terhei.....	193
<i>Börcsök Zoltán, Pásztory Zoltán</i>	
A faenergetika racionális, környezetkímélő lehetőségei (kutatási összefoglaló).....	204
<i>Németh Gábor; Kocsis Zoltán</i>	
Faipari projektek szakirodalmi elemzése	212
<i>Novotni Adrienn</i>	
Faipari por-forgács elszívó hálózatok és a munkahelyi légtér fapor tartalmának kérdései ...	222
<i>Németh Gábor, Németh Szabolcs, Kocsis Zoltán, Magoss Endre</i>	
Természetes anyagok szigetelőképessége.....	230
<i>Szendi Dorina; Pásztory Zoltán</i>	

Foreign languages section

Thermal resistance values of natural fiber-based insulation panels and the impact of their thickness on the thermal transmittance values of an external wall structure.....	240
<i>Le Duong Hung Anh, Zoltán Pásztory</i>	
Developing Info-Droplets to model the dark flight phase of meteorite fall.....	252
<i>Agota Lang, Matyas Bejo, Benke Hargitai, Barnabas Molnar, Aron Sztojka</i>	
Social Network and Text Mining Analysis of Publications Related to Remote Sensing and R Programming.....	260
<i>Zsolt Tóth</i>	
Small and medium-sized enterprises (smes) in Hungary: industry 4.0 trends and challenges	272
<i>Ádám Fazekas, Endre Magoss, Veronika Suriné Lengyel</i>	
The effect of natural-based additive on paper.....	284
<i>Zsófia Kóczán, Katalin Halász, Edina Preklet, Zoltán Pásztory</i>	
Comparative social network analysis (SNA) of FP7 and Horizon 2020 projects on remote sensing	293
<i>Zsolt Tóth</i>	
Advancements in Sustainable Wood Furniture: A Comprehensive Review of Bonding Techniques and Adhesives	302
<i>Seda Baş, Levente Dénes, Csilla Csiha</i>	

Social Network and Text Mining Analysis of Publications Related to Remote Sensing and R Programming

Zsolt Tóth

PhD, University associate professor, University of Sopron, Faculty of Wood Engineering and Creative Industry, email: toth.zsolt@uni-sopron.hu

DOI: https://doi.org/10.35511/978-963-334-453-8.Toth_Zs-1

Abstract

In the course of the research, we used network research methods and collaborative publications to explore the network of researchers conducting remote sensing research using the R programming language and to identify clusters of researchers. Later, some simple frequency diagrams were drawn. Then, text analysis methods were used to identify the main research topics based on the abstracts.

Keywords: remote sensing, R, social network analysis, publication analysis, text mining

Literature review

The presentation of the literature background can be limited, since the aim of the research is to study the literature on the research topic itself, using certain SNA and text mining methods in R. Some partly related articles may, however, be useful in exploring this topic. The scientific literature on social network analysis and text mining in R is quite diverse. Various articles focus on the use of several packages of R in different scientific and industrial domains. Beside actively studied collaborative networks (Santirojanakul, 2018), e.g. study of public health knowledge networks (Castrillón et al., 2022) (Fu et al., 2018), livestock movements (Cabezas et al., 2021) and food security (Xie et al., 2021) in agriculture or education networks (Suraj & Roshni, 2016) can be considered important topics. The well-known SNA methods are often complemented by data mining methods. K-mean classification (El-Moussaoui et al., 2022) seems particularly relevant. Some of network analyses focus on bibliographical approach. (Xie et al., 2021)

Text mining with R often focuses on scientific databases. There lots of relevant examples of this phenomena e.g. in health science (Ong et al., 2022) (Kurada & Kanadam, 2018), in media studies (Malele et al., 2022), in engineering (Yang & Zhang, 2022) (Gupta et al., 2021), in sport analysis (Sun, 2022); in nearly all areas of social life (Suresh, 2021) (Luo et al., 2021). Almost all of them are based on common scientific methodology. (Gao, 2022) (Lee et al., 2020) (Saini et al., 2019) (Jayasekara & Abu, 2018) (Bhargava & Rao, 2018)

The importance of text mining and network analysis is already an integral part of the R user manuals, as well. (Garson, 2021) Previously, those two topics left something to be desired in R community. (Vidoni, 2021) (Codabux et al., 2021)

Methods

The sample was retrieved from the Scopus database using the following search term:

(ALL ("r language" OR "r programming")) AND (remote AND sensing)

A total of 702 records matched the search term. The bibliographic data downloaded were mainly used for social network analysis (based on connection between authors) and text mining (analysing the abstracts).

The analysis was performed using R packages (bib2df, igraph, Matrix, dplyr, ggplot2 and udpipe). First, the BibTeX file was loaded into the more sophisticated tibble object than the data frame, which combines the advantages of the relational table and the list object. Then, pairs of authors were created and loaded into a vector pair.

The authors' pairs were first converted into a list object, then into an intermediate graph, and finally into a matrix. A graph could be constructed from the matrix using the appropriate function to write the net. We then generated a binary adjacency matrix from the graph to describe the project participants' relationships. Because of the matrix's size and structure, it needed to be optimized, so it was converted into a network graph that could be plotted and analyzed directly. After the parameters were entered, the network was plotted. Because the very complex network plotted was unsuitable for visual evaluation, it was characterised in terms of density, diameters, and transitivity.

Clusters of author collaborations have been listed and briefly analysed.

For text analysis, we first plotted simple distributions (number of articles by newspaper, publisher, year and type without NA) based on abstracts of articles.

The package used would allow language-agnostic tokenization, tagging, lemmatization and dependency parsing of raw text. As an introduction, the study examined the frequency of word types, the frequency within the most important word types, and the keywords that can be extracted from abstracts.

Results

Figure 1 shows that the network is quite interconnected. Visually, two major groups emerge. However, the visual structure of large, complex networks tell us little about the true nature of the network.

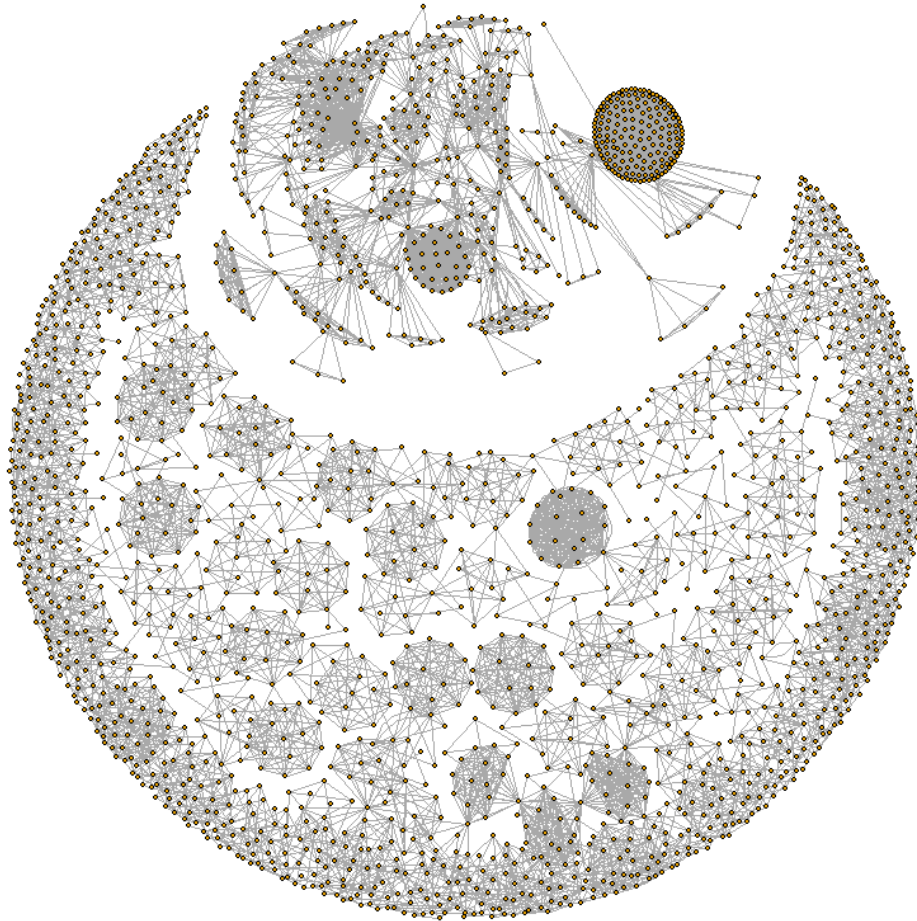


Figure 1. The authors' network of contacts

The network indicators highlight an interesting relationship. Edge density describes the ratio of all existing links between actors, referring to the level of cohesion of the network. In our case it is quite low. (0.009) If there is a connection between A and B and between B and C, then in a transitive network A and C are also connected. This is measured by the transitivity indicator whose value is staggeringly high. (0.995) The diameter, the distance between the farthest peaks, is 9 compared to the usual 6-7.

Based on these three indicators, the number of connections in the extensive network is therefore relatively small compared to the number of possible connections. The network works on the principle of "my friend's friend is my friend". This does not reflect well on the scientific network under study, but it can be considered typical.

Figure 2 shows the clusters of the network defined using the simplest methodology. At this level of complexity, it is obviously impossible to draw any concrete conclusions from the figure, but the many clusters obviously indicate many distinct research groups.

The largest cluster consists of 171 authors. The total number of clusters is 311. These clusters should obviously be merged, but with such a high initial number of cases, merging them risks a large loss of data and requires very sophisticated computational work that is beyond the scope of this study.

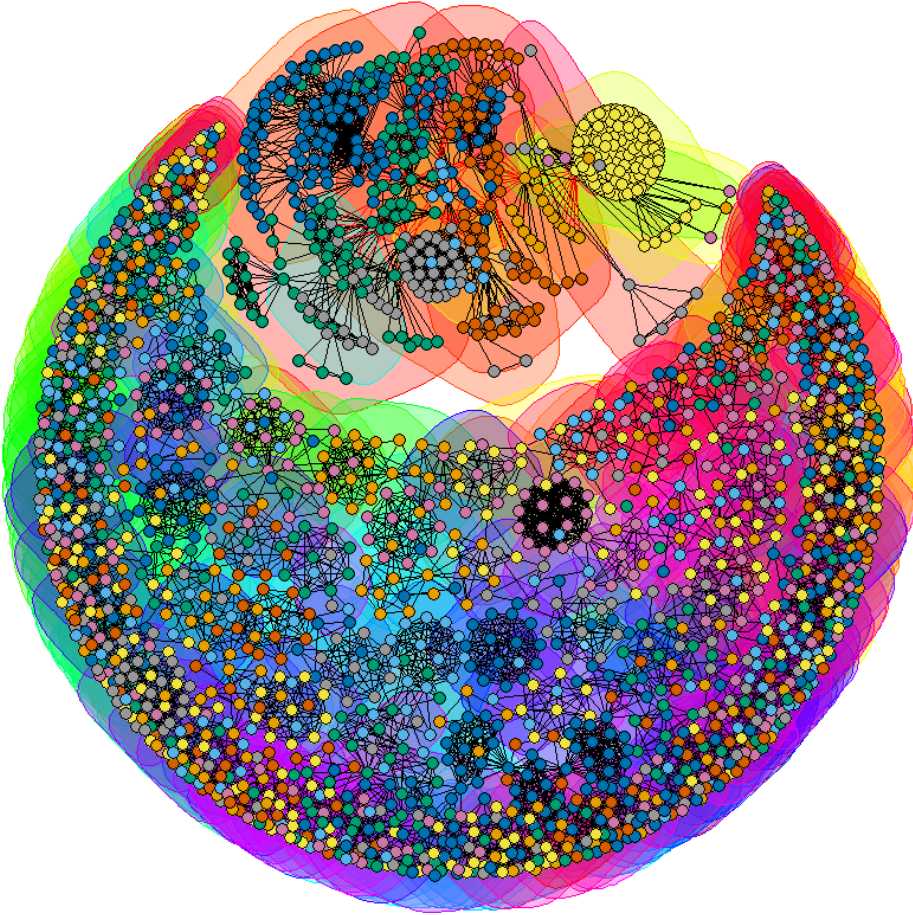


Figure 2. Clusters of authors' network

The examination of degree numbers is an important element of network analysis. Here it seems less important. Visually, however, it can be said that the degree numbers would basically follow a power distribution if there were not a significant author network clustered around a high degree number. Obviously, this is a group of people who have published each other's papers, or a group of researchers working intensively together (Figure 3).

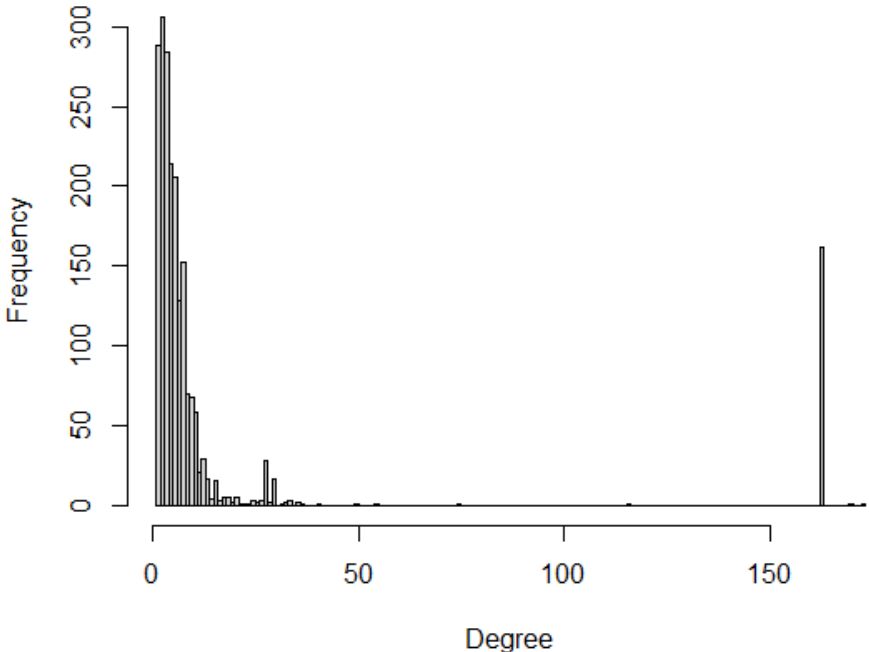


Figure 3. Frequency of degrees

Before the basic text mining procedure, some simple bar charts were plotted. It was no surprise that the journal Remote Sensing published the most articles, but it is somewhat surprising that it does not stand out from the field at all. (Figure 4)

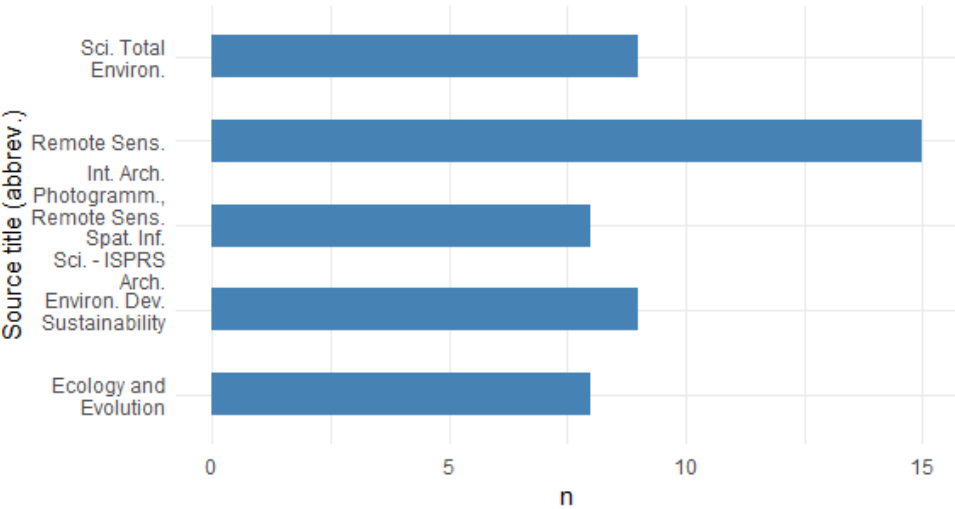


Figure 4. Most popular journals in remote sensing and R programming

It is obvious in this scientific area that the high-capitalisation scientific journal publishing companies dominate (Figure 5).

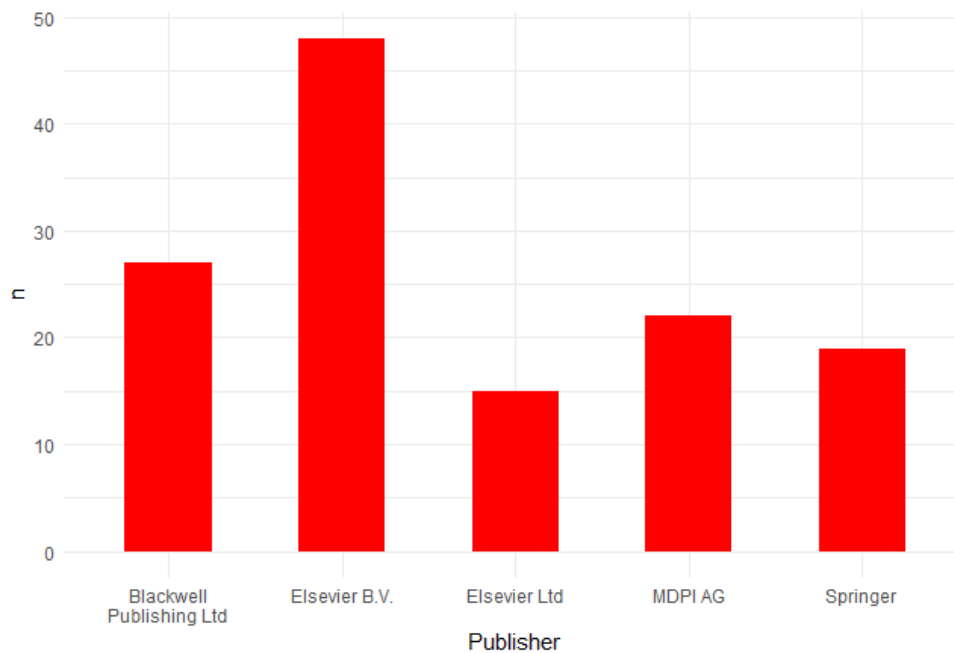


Figure 5. Publishers with the most articles in remote sensing and R programming

The "marriage" of remote sensing and R in publications peaked in 2020, the reasons for the 2021 decline are not yet known, and we do not have a complete data set for 2022. This is also true for 2021 to a limited extent. (Figure 6)

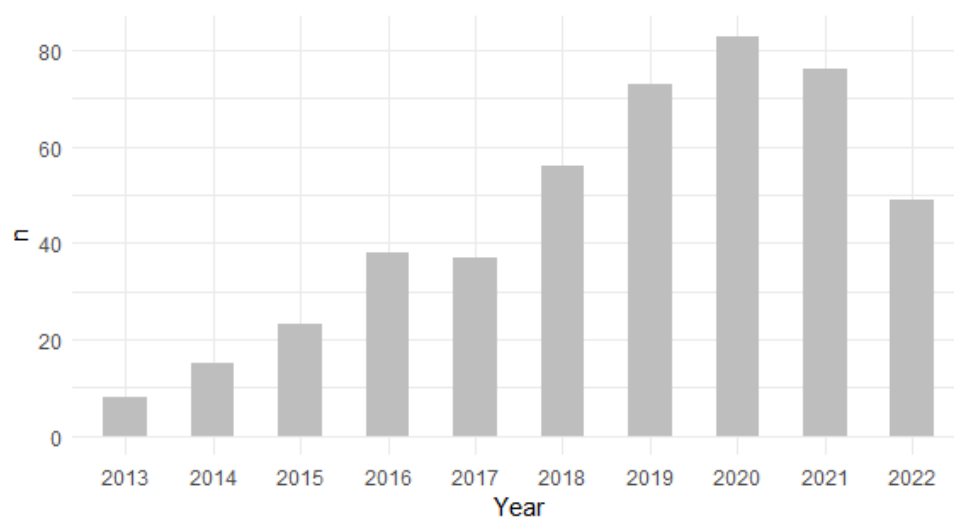


Figure 6. Publications related to remote sensing and R programming by year

Figure 7 shows the superiority of journal articles over other forms of publication. The situation is essentially the same in all disciplines. Scientists basically write journal articles in Q1-Q4 journals because this is the key to a scientific career.

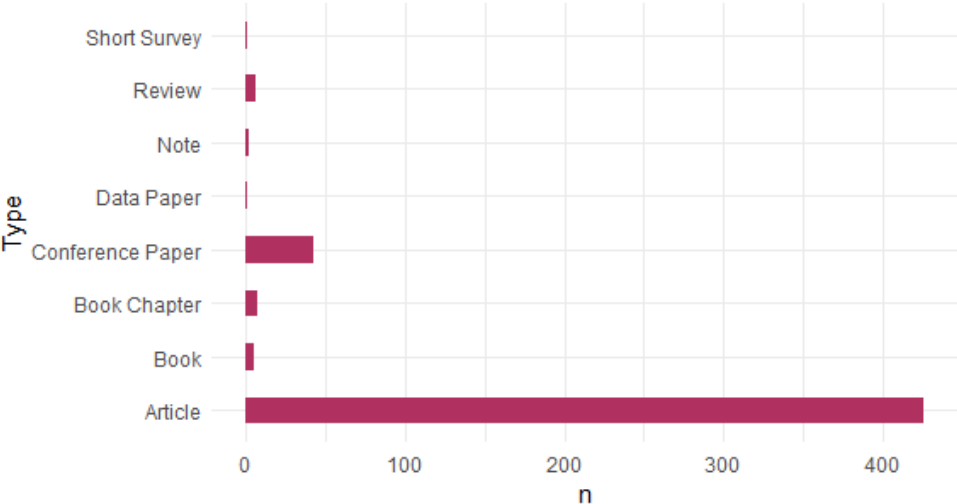


Figure 7. Publications related to remote sensing and R by type

The first step in the text mining process was to examine the parts of speech (word type) frequency of the abstracts matching the search criteria.

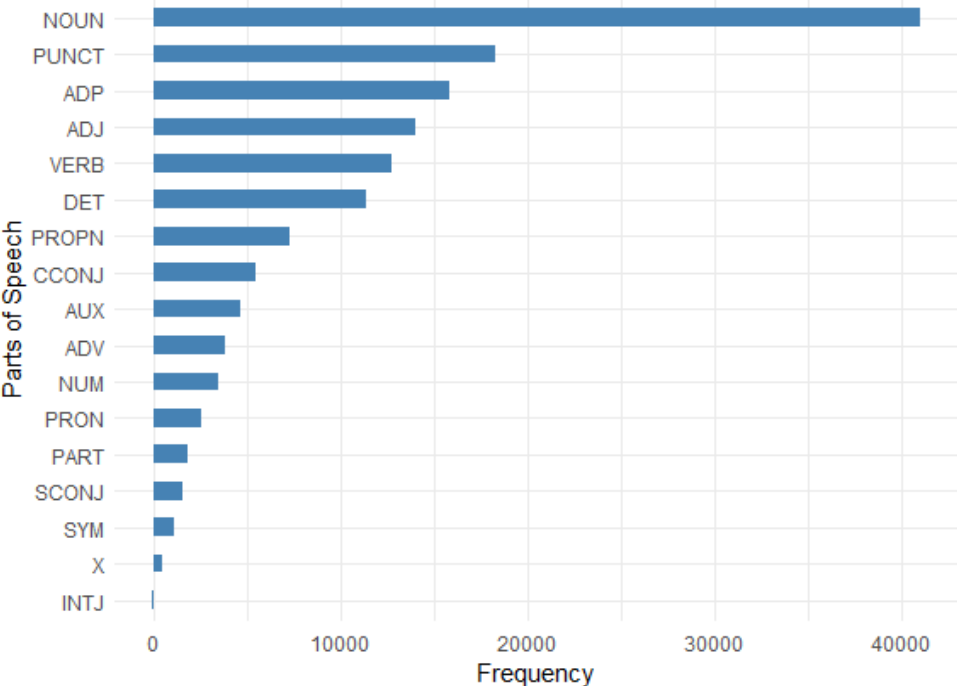


Figure 8. UPOS (Universal Parts of Speech) frequency of occurrence in abstracts

It is somewhat surprising that the nouns that occur most frequently refer primarily to the agricultural-biological-forestry-water management character, in addition to the technical side of text mining. (Figure 9)

The frequency of adjectives confirms the ecological dominance of remote sensing research with R. (Figure 10)

Unlike nouns and adjectives, the most common verbs did not in any way indicate the nature of the research, but rather only that it was indeed research. Based on our previous research, this is relatively less surprising, with verbs tending to carry additional information in publications of social science and humanities. (Figure 11)

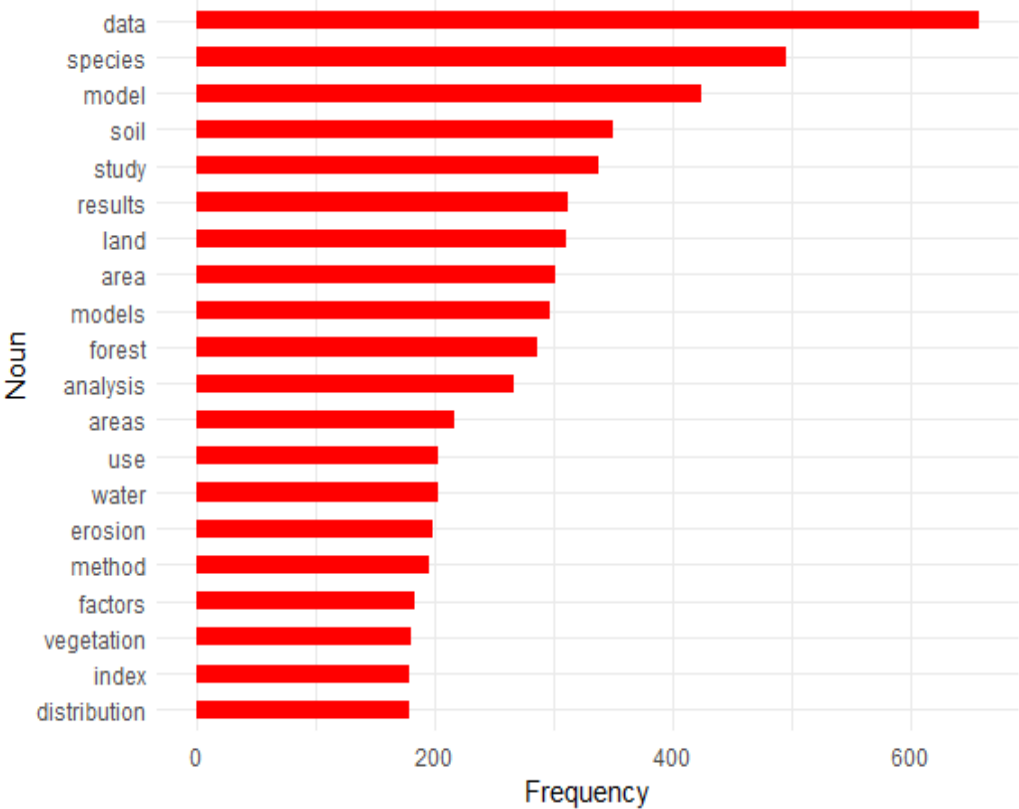


Figure 9. Most occurring nouns in abstracts

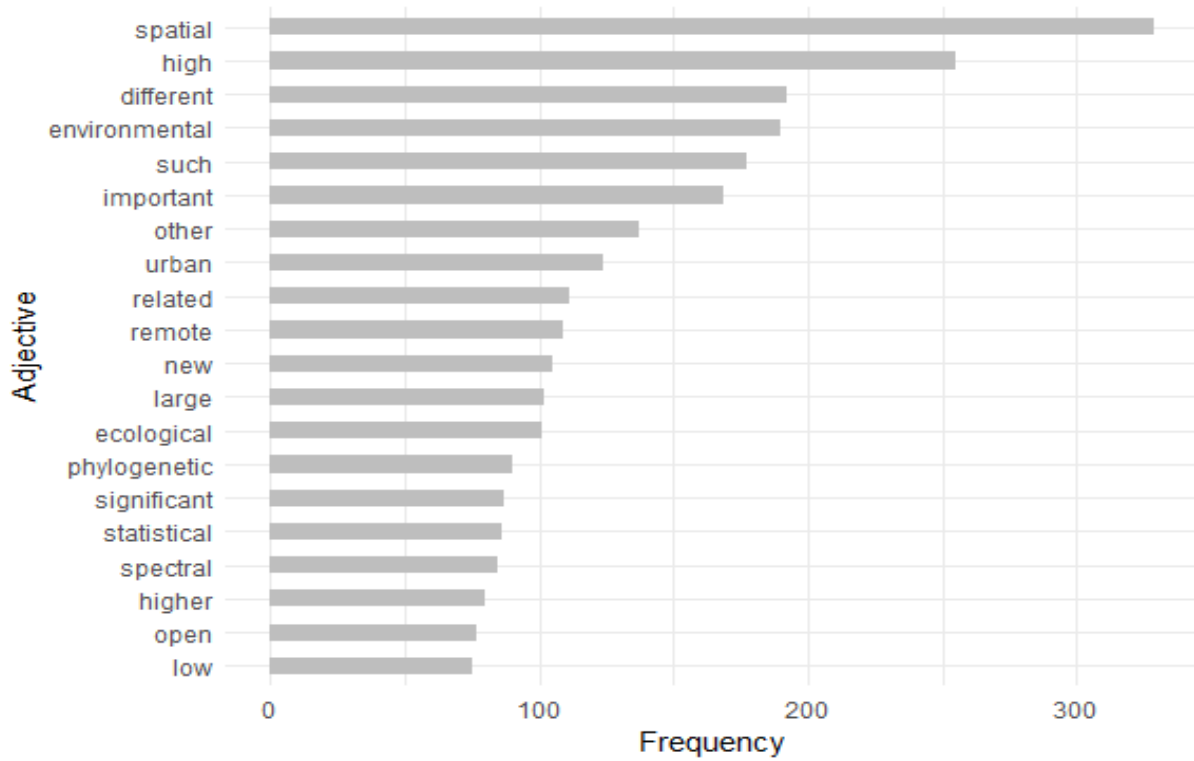


Figure 10. Most occurring adjectives in abstracts

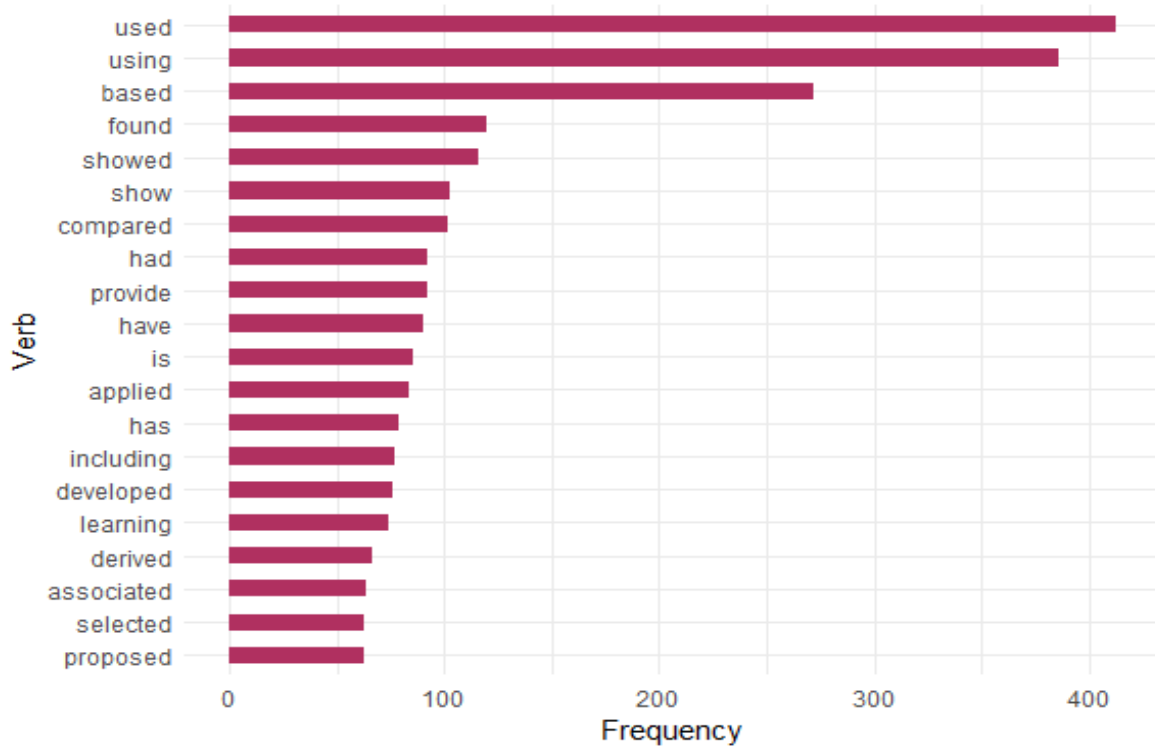


Figure 11. Most occurring adjectives in abstracts

The next phase pushed the computing capabilities of ordinary computers. One of the most well-liked (unsupervised) techniques for keyword extraction in information retrieval is RAKE. Rapid Automatic Keyword Extraction, or RAKE for short, is a domain-independent keyword extraction method that looks for key phrases within a body of text by examining how frequently words appear and how often they occur alongside other words. In addition to the technical background and the ecological keywords encountered earlier, RAKE also highlighted some other, more technical research directions.

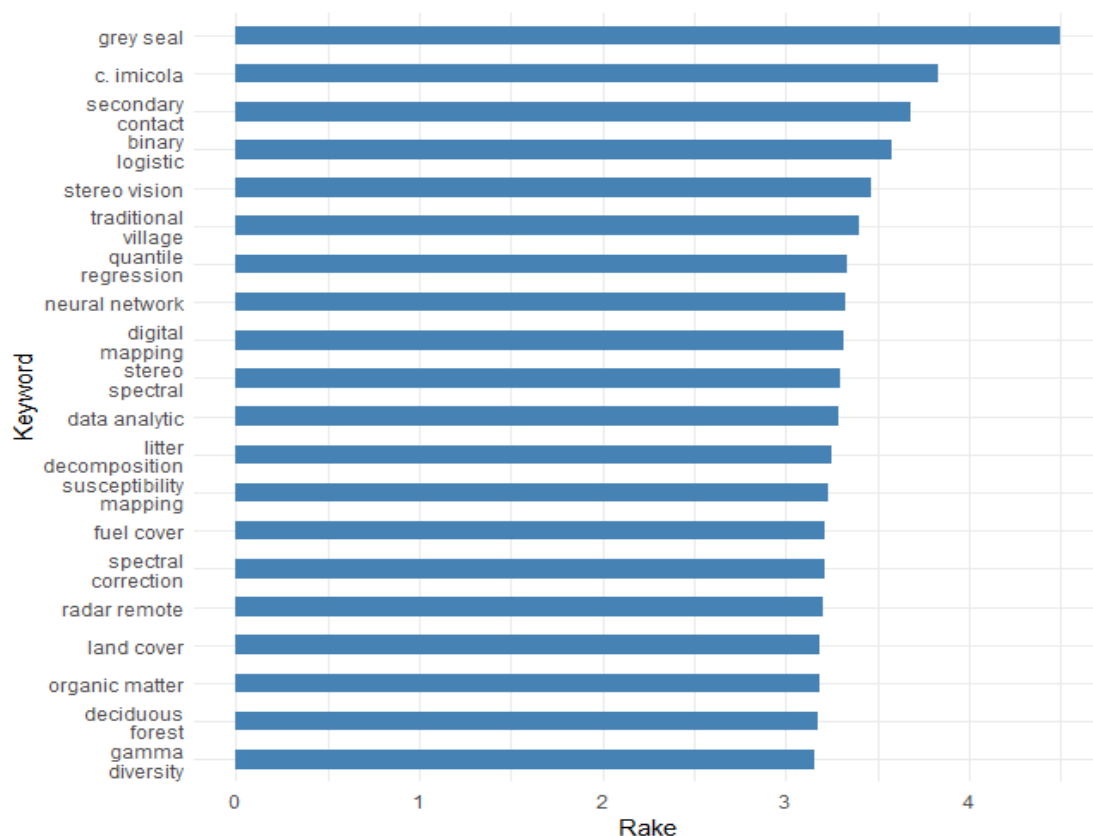


Figure 11. Keywords identified by RAKE

Simple nouns and verbs can be combined to produce phrases in English (or most likely many other languages). With the help of reverse engineering, we can identify the top phrases, which are just keywords or subjects, from the abstracts' data. The verb pairs as keyword pairs can be seen in Figure 12. Verb pairs essentially highlight the technological and ecological results of research. So, we got a different result than with the RAKE algorithm.

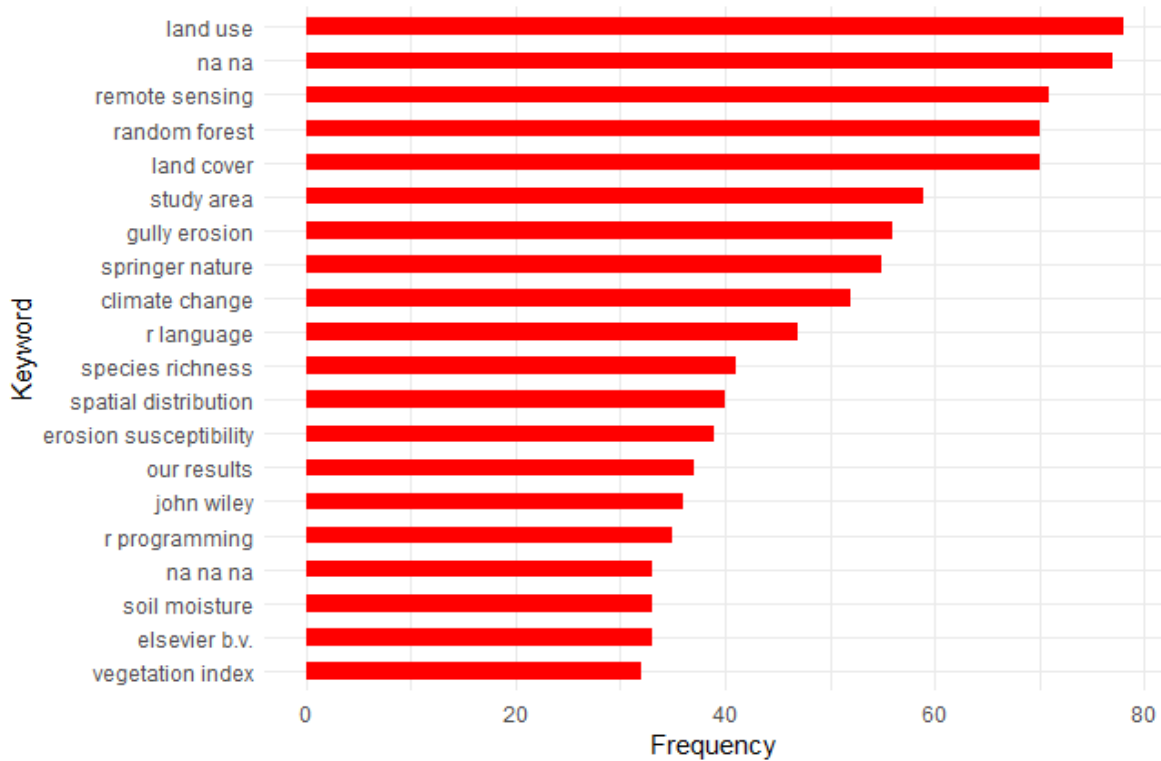


Figure 12. Verb pairs as keyword pairs

Acknowledgments

This article was made in frame of the project TKP2021-NVA-13 which has been implemented with the support provided by the Ministry of Culture and Innovation of Hungary from the National Research, Development and Innovation Fund, financed under the TKP2021-NVA funding scheme.

Bibliography

- Cabezas, A. H. et al., 2021. Spatial and network analysis of U.S. livestock movements based on Interstate Certificates of Veterinary Inspection. *Preventive Veterinary Medicine*, Volume 193. DOI: <https://doi.org/10.1016/j.prevetmed.2021.105391>
- Castrillón, S. M. et al., 2022. Social Network Analysis of the Knowledge Network in Public Health in the National Observatory of Colombia: An Analysis of Documents, *Revista Gerencia y Políticas de Salud*, Volume 21. DOI: <https://doi.org/10.11144/Javeriana.rgps21.arsr>
- Codabux, Z., Vidoni, M. & Fard, F. H., 2021. *Technical debt in the peer-review documentation of r packages: A ropensci case study*. s.l., Institute of Electrical and Electronics Engineers Inc., pp. 195-206. DOI: <https://doi.org/10.1109/MSR52588.2021.00032>
- El-Moussaoui, M., Hanine, M., Kartit, A. & Agouti, T., 2022. A k-Mean Classification Study of Eight Community Detection Algorithms: Application to Synthetic Social Network Datasets. *Lecture Notes on Data Engineering and Communications Technologies*, Volume 105, pp. 557-572. DOI: https://doi.org/10.1007/978-3-030-90618-4_28

- Fu, C. et al., 2018. Social network analysis of China computer federation co-author network. *Lecture Notes in Computer Science* (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), Volume 10745 LNCS, pp. 422-432. DOI: https://doi.org/10.1007/978-3-319-74521-3_45
- Gao, F., 2022. *Structural Modeling of English Language Signal Based on Word Frequency Data Mining and Peak Analysis*. s.l., Institute of Electrical and Electronics Engineers Inc., pp. 718-721. DOI: <https://doi.org/10.1109/ICAAIC53929.2022.9792920>
- Garson, G. D., 2021. *Data Analytics for the Social Sciences: Applications in R*. s.l.:Taylor and Francis. DOI: <https://doi.org/10.4324/9781003109396>
- Gupta, M., Kumar, R., Walia, H. & Kaur, G., 2021. *Airlines based Twitter Sentiment Analysis Using Deep Learning*. s.l., Institute of Electrical and Electronics Engineers Inc..DOI: <https://doi.org/10.1109/ISCON52037.2021.9702502>
- Jayasekara, P. K. & Abu, K. S., 2018. *Text Mining of Highly Cited Publications in Data Mining*. s.l., Institute of Electrical and Electronics Engineers Inc., pp. 128-130. DOI: <https://doi.org/10.1109/ETTLLIS.2018.8485261>
- Lee, J., Kim, H. & Jung, H., 2020. Deep learning module optimization based on sequential data prediction. *ASM Science Journal*, Volume 13, pp. 82-91.
- Luo, X., Liu, Q. & Qiu, Z., 2021. A Correlation Analysis of Construction Site Fall Accidents Based on Text Mining. *Frontiers in Built Environment*, Volume 7. DOI: <https://doi.org/10.3389/fbuil.2021.690071>
- Malele, V., Letsoalo, M. E. & Mafu, M., 2022. *Sentiment Analysis of South African News Company*. s.l., Institute of Electrical and Electronics Engineers Inc..DOI: <https://doi.org/10.1109/icABCD54961.2022.9856072>
- Ong, S.-Q., Pauzi, M. B. M. & Gan, K. H., 2022. Text mining in mosquito-borne disease: A systematic review. *Acta Tropica*, Volume 231. DOI: <https://doi.org/10.1016/j.actatropica.2022.106447>
- Saini, S., Punhani, R., Bathla, R. & Shukla, V. K., 2019. *Sentiment Analysis on Twitter Data using R*. s.l., Institute of Electrical and Electronics Engineers Inc., pp. 68-72. DOI: <https://doi.org/10.1109/ICACTM.2019.8776685>
- Santirojanakul, S., 2018. Analysis of research topics and collaborative network of Thai government supported scholars. *Journal of Engineering Science and Technology*, Volume 13, pp. 104-115.
- Sun, Z., 2022. A Novel Data Mining Algorithm and Its Applications in Basketball Match Technique and Tactical Analysis. *Mathematical Problems in Engineering*, Volume 2022. DOI: <https://doi.org/10.1155/2022/3391855>
- Suraj, P. & Roshni, V. S. K., 2016. *Social network analysis in student online discussion forums*. s.l., Institute of Electrical and Electronics Engineers Inc., pp. 134-138. DOI: <https://doi.org/10.1109/RAICS.2015.7488402>
- Suresh, Y., 2021. *Restaurant Review System based on Sentimental Analysis using R Language*. s.l., Institute of Electrical and Electronics Engineers Inc..DOI: <https://doi.org/10.1109/CONIT51480.2021.9498428>
- Vidoni, M., 2021. Software Engineering and R Programming: A Call for Research. *R Journal*, Volume 13, pp. 6-14. DOI: <https://doi.org/10.32614/RJ-2021-108>
- Xie, H., Wen, Y., Choi, Y. & Zhang, X., 2021. Global trends on food security research: A bibliometric analysis. *Land*, Volume 10, pp. 1-21. DOI: <https://doi.org/10.3390/land10020119>
- Yang, N. & Zhang, Y., 2022. Railway Fault Text Clustering Method Using an Improved Dirichlet Multinomial Mixture Model. *Mathematical Problems in Engineering*, Volume 2022. DOI: <https://doi.org/10.1155/2022/7882396>