

Using AI-SPedia to Study Saudi Universities' Research Outputs in the Artificial Intelligence Field

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Abstract

The Vision 2030 of Saudi Arabia which was developed in 2016 is not limited to diversifying the economy and reduce the dependence on the hydrocarbon sector as many people believe. Artificial Intelligence (AI) is among the main strategic priorities of the Vision 2030. Saudi Arabia is planning to be the world leader in the area of technology by putting AI at the heart of the country's development and growth. This paper looked at research output in AI domain that are produced by Saudi Arabia to calculate the growth rate over years and to measure how much of these research are covered by altmetrics which basically capture all kinds of research mentions in many different online platforms such as social media. We used AI-SPedia knowledge base repository which is built to accommodate AI research around the world with all the details including bibliometric and altmetric indicators.

Data and Methodology

The figure shows the extraction process starting from two data sources: bibliometrics and altmetrics until the AI-SPedia has been built by using protégé.

- Bibliometrics are indicators used to evaluate research impact based on citation count.
- Altmetrics are indicators used to evaluate research impact based on the existence of publications on the online platforms.

We used AI-SPedia which is a semantic knowledge base repository. It accommodates AI publications around the world and the updated impact indicators such as bibliometrics and altmetrics. AI-SPedia are loaded by AI publications from different bibliographical databases but the main sources are web of science database for bibliometric data and altmetric.com provider for altmetric data.

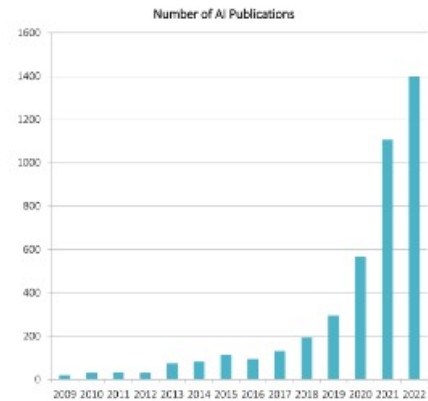


Chart 1. Number of AI Publications in Saudi Universities.

Introduction

In the modern era, technological developments and scientific research are considered as the key factors in nation evolution. Saudi Arabia is among top 20 countries of the world in economy. Universities at Saudi Arabia are not only funded to perform research in different area to solve internationally recognized problems but they have to encouraged to do research in areas based on Vision 2030 and national priorities of Saudi Arabia. Several programs have been created by different sectors like Ministry of Education to support research that is directly related to Saudi society and play a significant role in enhancing the life quality of Saudi citizens. Saudi Arabia has more than 20 universities that are involved in different supported programs to do research based on the priorities that set by Saudi government. This includes excellence research centers which are established by funding from Saudi government. Many of Saudi universities now lay on the top list of universities around the world based on QS, THE and Shanghai because of their research quality and impact.

SPARQL Code

```

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd:
<http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX ont:
<http://www.semanticweb.org/yasser/ontologies/2022/1/AI-SPedia-ontology-7#>

SELECT ?university (count (?paper) as
?total_papers) (count(?altmetric_score) as
?altmetric_papers)
WHERE{ ?paper ont:affiliation ?Saudi_Arabia . }
GROUP BY ?university
ORDER BY DESC (?total_papers)
    
```

Results and Discussion

Two phases of growth were identified. The first phase started from 2009 until 2015, with a growth rate of around 28.23% per year. The second phase started from 2016 until 2022, with a much higher growth rate of 47.07%.

The majority of AI contributions came from King Abdulaziz University with 864 AI publications, followed by King Saud University with 559 AI publications. The top ten Saudi universities based on the number of AI publications are listed in Table 1. We need to note that some papers have authors from more than one local university.

Conclusion

This study has shown that Saudi Arabia's scientific publications in AI domain have been increased clearly over the years. The growth rate was 28.23% in the period between 2009 and 2015 while the growth rate increased to 47.07% in the period between 2016 and 2022. The big jump in the quantity of AI research was attributed mainly to Saudi Vision 2030 which was established in 2016.

Moreover, this paper showed the altmetric coverage of research output for the most productive universities in Saudi Arabia in AI area. The result found more than 30% of the AI research output from the top ten universities at KSA are covered by altmetric platforms. However, the altmetric mentions are detected to vary significantly, ranging from as low as 17.1% for King Fahd University for Petroleum and Minerals to as high as 44.15% for King Abdullah University for Science and Technology. Beside this, there is no correlation between the most producer universities and the percentage of altmetrics coverage.

Table 1. List of Top 10 Saudi University in AI

University	Total AI Papers	Altmetric Papers	Coverage
King Abdulaziz University	864	341	39.47%
King Saud University	559	168	30.05%
Taif University	345	114	33.04%
Prince Sattam University	324	88	27.16%
Prince Sultan University	321	97	30.22%
King Fahd University	310	53	17.10%
University of Jeddah	247	67	27.13%
King Khalid University	212	64	30.19%
Umm Al-Qura University	193	75	38.86%
King Abdullah University	188	83	44.15%

