

Explore and Usage of Artificial Intelligence Tools for the research scholars: A Special Reference at Bharathidasan University

¹Balasubramani, R., Muthumari, P. and ²Vijayaluxmy, S.

¹Dept. Library and Information Science, Bharathidasan University

¹balar@bdu.ac.in

²Government Arts and Science College for Women, Paramakudi, Ramnad, India

²drp.muthumari@gmail.com

³Trincomalee Campus, Eastern University Sri Lanka

Abstract

In the contemporary academic landscape, the integration of Artificial Intelligence (AI) tools has become increasingly prevalent, revolutionizing the research methodologies employed by scholars across diverse disciplines. This paper delves into the exploration and utilization of AI tools specifically tailored for research scholars at Bharathidasan University. The study begins by providing an overview of the current state of AI in academic research, highlighting its transformative potential and the paradigm shift it brings to traditional research approaches. Bharathidasan University, known for its commitment to academic excellence, serves as a specific reference point for investigating the incorporation of AI tools into scholarly pursuits. The paper then proceeds to examine various AI tools applicable to research endeavors, including natural language processing, machine learning algorithms, and data analytics. Special emphasis is placed on tools designed to enhance literature reviews, automate data analysis, and streamline the research process. Case studies from Bharathidasan University illustrate practical applications, showcasing how these tools can be effectively employed in diverse research domains. Furthermore, the challenges and ethical considerations associated with the use of AI in research are critically examined. Addressing concerns such as bias in algorithms, data privacy, and the need for interdisciplinary collaboration, the paper proposes guidelines for responsible AI integration within the academic context. The impact of AI on fostering interdisciplinary

collaboration and knowledge exchange among scholars at Bharathidasan University is also discussed. The potential for AI to facilitate cross-disciplinary research and create synergies among various academic departments is explored, contributing to a more holistic and integrated research environment. The conclusion emphasizes the transformative potential of AI tools for research scholars at Bharathidasan University and suggests avenues for future exploration. As AI continues to evolve, the integration of cutting-edge technologies into the research process is crucial for staying at the forefront of academic innovation.

Keywords: *Artificial Intelligence, Research Scholars, Bharathidasan University, Machine Learning, Data Analytics, Interdisciplinary Collaboration, Ethical Considerations.*

Introduction

In the ever-evolving landscape of academia, the infusion of Artificial Intelligence (AI) tools has emerged as a transformative force, reshaping the methodologies employed by researchers across diverse disciplines. This research paper embarks on a comprehensive exploration of AI tools customized for the scholarly community at Bharathidasan University. Recognized for its unwavering commitment to academic excellence, the university serves as an ideal locus for investigating the integration of AI into scholarly pursuits. The paper initiates with a panoramic view of the current state of AI in academic research, accentuating its revolutionary potential and the consequent paradigm shift from conventional research approaches. Focusing specifically on Bharathidasan University, the study delves into a nuanced examination of AI tools applicable to various research endeavors. These tools, encompassing natural language processing, machine learning algorithms, and data analytics, are scrutinized for their capacity to enhance literature reviews, automate data analysis, and streamline the overall research process. Real-world

case studies from the university serve as practical illustrations, elucidating how these AI tools can be effectively harnessed across diverse research domains. Moreover, the paper critically addresses the challenges and ethical considerations inherent in the integration of AI into research practices. Thorough scrutiny is given to concerns such as algorithmic bias, data privacy, and the imperative for interdisciplinary collaboration. The research offers a set of guidelines aimed at fostering responsible AI integration within the academic context. A significant facet of the study revolves around the impact of AI on fostering interdisciplinary collaboration and knowledge exchange among scholars at Bharathidasan University. The exploration of AI's potential to facilitate cross-disciplinary research and create synergies among different academic departments contributes to the envisagement of a more holistic and integrated research environment. In this paper underscores the transformative potential of AI tools for research scholars at Bharathidasan University and posits directions for future exploration. As AI continues its evolutionary trajectory, the integration of cutting-edge technologies into the research process emerges as an indispensable strategy for staying at the forefront of academic innovation.

To construct and validate an artificial intelligence (AI) contouring tool to automate primary gross tumor volume (GTV) contouring in patients with NPC. Materials and Methods MRI data sets covering the nasopharynx from 1021 patients (median age, 47 years; 751 males, 270 female) with NPC between September 2016 and September 2017 were collected and divided into training, validation, and testing cohorts of 715, 103, and 203 patients, respectively (Lin et. al., 2019). A qualitative study using a grounded theory approach to semistructured interview

analysis was conducted in general dermatology clinics at the Brigham and Women's Hospital and melanoma clinics at the Dana-Farber Cancer Institute (Nelson et. al., 2020). Twenty-four patients were interviewed about a direct-to-patient AI tool and 24 patients were interviewed about a clinician decision-support AI tool (Ma et. al., 2020). study developing and verifying automatic detection of active pulmonary tuberculosis from multi-slice spiral images based on deep learning. An AI tool for automatic detection of ATB in chest CT is successfully developed. The AI tool can accurately detect ATB patients, and distinguish between ATB and non- ATB cases, which simplifies the diagnosis process and lays a solid foundation for the next step of AI in CT diagnosis of ATB in clinical application. The AI-driven tool combined two deep convolutional neural networks with expert refinement (Leite et. al., 2020). study artificial intelligence-driven novel tool for tooth detection and segmentation on panoramic radiographs. The method showed a clinically significant reduction of 67% of the time consumed for the manual. To evaluate the benefits of an artificial intelligence (AI)-based tool for two-dimensional mammography in the breast cancer detection process. 14 radiologists assessed a dataset of 240 digital mammography images, acquired between 2013 and 2016, using a counterbalance design in which half of the dataset was read without AI and the other half with the help of AI during a first session and vice versa during a second session, which was separated from the first by a washout period (**Pacilè et. al., 2020**). As technology is evolving, more and more AIbased options emerge that promise to detect human emotions and support decision making (Aysolmaz et. al., 2021). focus on the full delegation of detecting emotions to AI to contribute to the understanding how such AI is perceived and why it is accepted. These professionals invested in

AI interrogation practices—practices enacted by human experts to relate their own knowledge claims to AI knowledge claims.

Materials and Methods

- Provide an overview of the increasing importance of Artificial Intelligence (AI) tools in academic research.
- Highlight the relevance of AI tools for research scholars at Bharathidasan University
- Review existing literature on the use of AI tools in academic research
- Identify gaps and areas where AI tools have not been extensively explored in the context of Bharathidasan University
- Discuss the impact of AI on research methodologies and outcomes

AI Applications in Research

Artificial Intelligence (AI) applications have become integral to academic research, ushering in a transformative era that redefines traditional methodologies and introduces novel avenues for exploration across diverse disciplines. The incorporation of AI tools not only amplifies efficiency but also unleashes unprecedented possibilities for data analysis, pattern recognition, and knowledge generation. This comprehensive overview delves into key AI applications in research, emphasizing their revolutionary impact. Natural Language Processing (NLP) facilitates enhanced literature reviews, empowering researchers to navigate extensive literature efficiently. Machine learning algorithms enable swift data analysis and prediction, unveiling intricate patterns

that may elude human observation. AI-driven data analytics automate the labor-intensive aspects of data collection and processing, allowing researchers to focus on interpretation. The automation of repetitive tasks increases overall efficiency, especially in experimental design and data collection. In fields like biology and medicine, AI excels at image and pattern recognition, enhancing analysis accuracy. Virtual research assistants, powered by AI, manage administrative tasks, freeing up researchers for intellectual work. Ethical considerations, including algorithmic bias and data privacy, demand careful attention to ensure the responsible and unbiased use of AI tools. As AI technology advances, its expanding applications in research promise innovative tools for data-driven decision-making, pushing the boundaries of knowledge and fostering a new era of discovery and innovation in academia.

Case Studies from Bharathidasan University

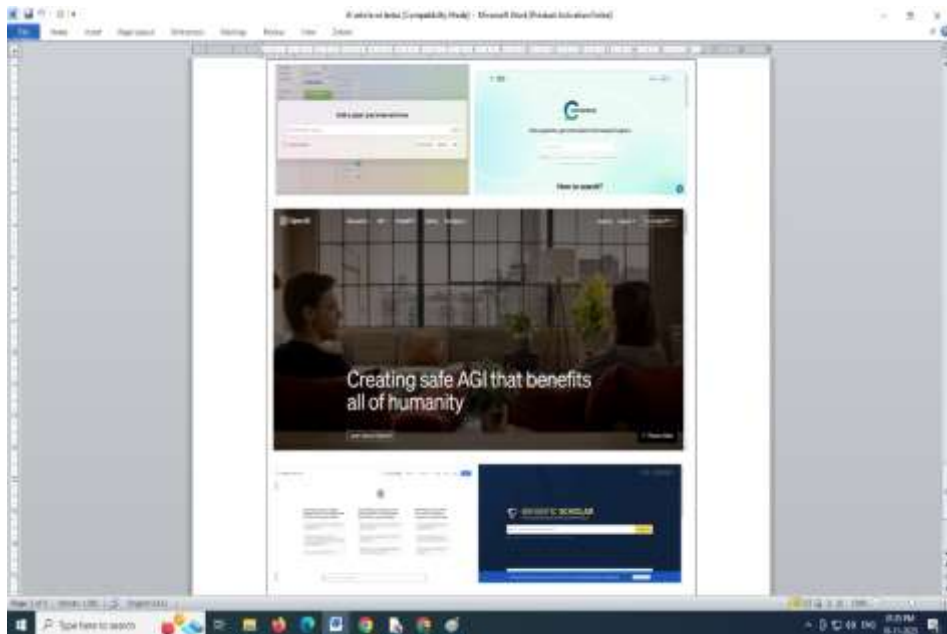


Table 1: frequently using these Artificial Intelligence Tools

Network/Consortia	Frequently	%	Occasionally	%	Rarely	%	Total	%
PLAITO	11	0.59	4	0.26	6	0.81	21	0.51
BARD AI	562	30.25	446	28.61	179	24.16	1187	28.55
QUILLBOT	214	11.52	609	39.06	161	21.73	984	23.67
Queirum	21	1.13	13	0.83	11	1.48	45	1.08
DreamBox	37	1.99	66	4.23	21	2.83	124	2.98
CHATGPT	694	37.35	263	16.87	168	22.67	1125	27.06
COGNII	169	9.10	124	7.95	130	17.54	423	10.17
Gradescope	150	8.07	34	2.18	65	8.77	249	5.99

Table-1 shows about the frequently using Artificial Intelligence tools. Among the 4158 multiple answers majority of 30.25% use the BARD AI frequently, 28.61% of them use occasionally, and 24.16% use rarely; 37.35% of them use the CHATGPT frequently, 16.87% use occasionally, and 22.67% of them use rarely; 11.52% of them use the QUILLBOT frequently, 39.06% use occasionally, 21.73% of them use rarely; 9.10% of them use COGNII frequently, 7.95% of the respondents use occasionally and 17.54% of them using rarely.

Table 2: Problems faced while accessing electronic resources

Problems	Most Frequently	Frequently	Occasionally	Not at all
Copy right protection	361 (29.83%)	449 (37.11%)	297 (24.55%)	103 (8.51%)
Difficult to access on particular websites	136 (11.24%)	224 (18.51%)	42 (3.47%)	808 (66.78%)
Download restriction	159 (13.14%)	126 (10.41%)	152 (12.56%)	773 (63.88%)

File preservation	164 (13.55%)	134 (11.07%)	141 (11.65%)	771 (63.72%)
Frequent hanging systems	139 (11.49%)	197 (16.28%)	201 (16.61%)	673 (55.62%)
Inconvenient usage electronic formats	164 (13.55%)	719 (59.42%)	142 (11.74%)	185 (15.29%)
Lack of awareness about way of access	176 (14.55%)	181 (14.96%)	135 (11.16%)	718 (59.34%)
Lack of IT skills	114 (9.42%)	36 (2.98%)	34 (2.81%)	1026 (84.79%)
Language barrier	82 (6.78%)	42 (3.47%)	89 (7.36%)	997 (82.40%)
Limited terminals	171 (14.13%)	134 (11.07%)	152 (12.56%)	753 (62.23%)
Password Restriction	163 (13.47%)	130 (10.74%)	129 (10.66%)	788 (65.12%)
Disturbance of Power supply	171 (14.13%)	156 (12.89%)	141 (11.65%)	742 (61.32%)
Slow accessing speed of Internet	167 (13.80%)	142 (11.74%)	173 (14.30%)	728 (60.17%)
Storage facilities	197 (16.28%)	173 (14.30%)	137 (11.32%)	703 (58.10%)
Time consuming	192 (15.87%)	188 (15.54%)	181 (14.96%)	649 (53.64%)
Virus attack	145 (11.98%)	139 (11.49%)	178 (14.71%)	748 (61.82%)
Others	22 (1.82%)	27 (2.23%)	52 (4.30%)	1109 (91.65%)

Majority 91.65% of the respondents never access the Artificial Intelligence tools because of other difficulties, 4.30% of them accessing occasionally, 2.23% of them accessing frequently and 1.82% of them accessing most frequently. Totally, 84.79% of the respondents not at all access the Artificial Intelligence tools due to Lack of IT skills, 2.81% of them access occasionally, 2.98% of them access frequently and 9.42% of them access most frequently. Totally, 82.40% of the respondents not

at all access because of Language barrier, 7.36% of them access occasionally, 3.47% of them access frequently and 6.78% of them access most frequently. Totally, 66.78% of the respondents not at all access because of Difficulty inaccessing particular websites, 3.47% of them access occasionally, 18.51% of them access frequently and 11.24% of them access most frequently. Totally, 65.12% of the respondents not at all access because of Password Restriction, 10.66% of them access occasionally, 10.74% of them access frequently and 13.47% of them access most frequently. Totally, 63.88% of the respondents not at all access because of Download restriction, 12.56% of them access occasionally, 10.41% of them access frequently and 13.14% of them access most frequently. Totally, 63.72% of the respondents not at all access because of File preservation, 11.65% of them access occasionally, 11.07% of them access frequently and 13.55% of them access most frequently. 62.23% of the respondents not at all access because of Limited terminals; 12.56% of them access occasionally, 11.07% of them access frequently and 14.13% of them access most frequently. Totally, 61.82% of the respondents not at all access because of Virus attack, 14.71% of them access occasionally, 11.49% of them access frequently and 11.98% of them access most frequently. Totally, 61.32% of the respondents not at all access because of disturbance of power supply, 11.65% of them access occasionally, 12.89% of them access frequently and 14.13% of them access most frequently. 60.17% of the respondents not at all access because of slow accessing speed of the Internet. Totally, 14.30% of them access occasionally, 11.74% of them access frequently and 13.80% of them access most frequently. 59.34% of the respondents not at all access because of Lack of awareness about the way of access. Totally, 11.16%

of them access occasionally, 14.96% of them access frequently and 14.55% of them access most frequently. Totally, 58.10% of the respondents not at all access because of Storage facilities, 11.32% of them access occasionally, 14.30% of them access frequently and 16.28% of them access most frequently. Totally, 55.62% of the respondents not at all access because of frequent hanging systems, 16.61% of them access occasionally, 16.28% of them access frequently and 11.49% of them access most frequently. A total of 53.64% of the respondents were not at all access because of Time consuming, 14.96% of them accessing occasionally, 15.54% of them access frequently and 15.87% of them access most frequently. 15.29% of the respondents not at all access because of inconvenient usage electronic formats, 11.74% of them access occasionally, 59.42% of them access frequently and 13.55% of them access most frequently. Totally, 8.51% of the respondents not at all access because of Copyright protection, 24.55% of them access occasionally, 37.11% of them access frequently and 29.83% of them access most frequently.

Table 5: Extent do they use electronic resources and printed materials

Parameter	Regularly	Sometimes	Not at all
Career development	257(21.24%)	941(77.77%)	12(0.99%)
Electronic resources only	359(29.67%)	845(69.83%)	6(0.50%)
For finding quick information	369(30.50%)	840(69.42%)	1(0.08%)
For study and research	564(46.61%)	645(53.31%)	1(0.08%)
Use electronic resources and printed material equally	522(43.14%)	684(56.53%)	4(0.33%)
Use electronic resources most of the time	634(52.40%)	574(47.44%)	2(0.17%)
Use printed material most of the time	321(26.53%)	887(73.31%)	2(0.17%)

The data in table-3 indicate majority 77.77% of the respondents, sometimes, as using Artificial Intelligence tools for career development,

21.24% of them use regularly, 73.31% of them use to get printed material most of them time, 26.53% use regularly, 69.83% of them use, sometimes, the electronic resources only and 29.67% of them use regularly, 69.42% of them use for finding quick information and 30.50% of them use regularly, 56.53 of them use for use electronic resources and printed material equally, and 43.14% of them use regularly, 53.31% use for study and research and 46.61% use regularly. Very few of them are not at all using the electronic resources and printed materials.

Benefits and Challenges

Ethical considerations in the integration of Artificial Intelligence (AI) into research methodologies are paramount, with challenges emerging in various dimensions. Algorithmic bias, a persistent concern, raises ethical dilemmas, particularly in studies involving sensitive topics or populations, necessitating researchers to grapple with issues of fairness, transparency, and responsible AI use. Data privacy becomes a critical focal point, as AI's reliance on large datasets raises apprehensions about safeguarding sensitive information, mandating robust measures and adherence to ethical standards. The complexity of AI tools introduces expertise requirements, posing challenges for researchers unfamiliar with AI technologies and underscoring the need for knowledge bridging. The resource intensiveness of implementing AI in research, both in infrastructure and costs, poses challenges for smaller institutions or projects. Interdisciplinary collaboration barriers, stemming from differences in language and methodologies, highlight the importance of effective communication and mutual understanding. Moreover, the potential overreliance on AI raises concerns about the loss of human oversight, emphasizing the necessity of maintaining a balance to avoid

overlooking critical contextual nuances or unforeseen factors that AI may not capture. Careful navigation of these ethical considerations is essential to ensure the responsible and equitable deployment of AI in research endeavors.

Results and Discussion

The future of interdisciplinary collaboration in the realm of Artificial Intelligence (AI) holds promising prospects, driven by the continuous evolution of AI technologies. The seamless integration of insights from arts, science, and social science domains using sophisticated AI tools could lead to groundbreaking discoveries at the intersections of traditionally distinct fields. Another potential avenue lies in tailoring AI applications to offer personalized research support for scholars, with virtual research assistants evolving to understand individual research styles and preferences. The future will likely prioritize an ethics-centric approach to AI development, emphasizing tools that not only adhere to ethical guidelines but actively contribute to minimizing biases, ensuring data privacy, and promoting transparency in research processes. Additionally, the integration of AI with Augmented Reality (AR) and Virtual Reality (VR) technologies could redefine how scholars interact with data, providing immersive experiences for deeper understanding. Refinement of human-AI collaboration models, where AI serves as collaborative partners rather than replacements, is anticipated. Recommendations for institutions include prioritizing continuous skill development for researchers, establishing and enforcing clear ethical guidelines, allocating resources for AI integration, promoting interdisciplinary collaboration, engaging the community in AI discussions, and investing in emerging technologies like AR and VR to

ensure scholars have access to cutting-edge tools for enhanced research experiences. These strategies aim to foster a research environment that maximizes the potential of evolving AI technologies while maintaining ethical standards and promoting collaboration across disciplines.

Conclusion & Recommendations

Based on the findings of this study, the researcher concluded that the use of Artificial Intelligence tools had a significant impact on the academic performance of students and faculty members at Bharathidasan University; however, they needed to improve their abilities in the use of Artificial Intelligence tools. The goal of this research was to help the library improve its offering of Artificial Intelligence tools to fulfill the academic needs of the university's students. This paper is designed to help libraries improve library services, particularly in supporting students with their academic work. This study will be made accessible for execution by the university library management.

Reference

- Lin, L., Dou, Q., Jin, Y. M., Zhou, G. Q., Tang, Y. Q., Chen, W. L., ... & Sun, Y. (2019). Deep learning for automated contouring of primary tumor volumes by MRI for nasopharyngeal carcinoma. *Radiology*, *291*(3), 677-686.
- Nelson, C. A., Pérez-Chada, L. M., Creadore, A., Li, S. J., Lo, K., Manjaly, P., ... & Mostaghimi, A. (2020). Patient perspectives on the use of artificial intelligence for skin cancer screening: a qualitative study. *JAMA dermatology*, *156*(5), 501-512.
- Ma, L., Wang, Y., Guo, L., Zhang, Y., Wang, P., Pei, X., ... & Lure, F. Y. (2020). Developing and verifying automatic detection of active pulmonary tuberculosis from multi-slice spiral CT images based on deep learning. *Journal of X-ray Science and Technology*, *28*(5), 939-951.
- Leite, A. F., Gerven, A. V., Willems, H., Beznik, T., Lahoud, P., Gaêta-Araujo, H., ... & Jacobs, R. (2021). Artificial intelligence-driven novel tool for tooth

detection and segmentation on panoramic radiographs. *Clinical oral investigations*, 25, 2257-2267.

Pacilè, S., Lopez, J., Chone, P., Bertinotti, T., Grouin, J. M., & Fillard, P. (2020). Improving breast cancer detection accuracy of mammography with the concurrent use of an artificial intelligence tool. *Radiology: Artificial Intelligence*, 2(6), e190208.

Aysolmaz, B., Leyer, M., & Iren, D. (2021). Acceptance of AI for delegating emotional intelligence: Results from an experiment.