Introduction to the International Journal of Artificial Intelligence for Science (IJAI4S)

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Abstract: The International Journal of Artificial Intelligence for Science (IJAI4S) is established to address the growing role of artificial intelligence (AI) in scientific research. As AI technologies continue to advance, they are increasingly applied across various scientific domains, including physics, chemistry, biology, medicine, environmental science, and engineering. However, many traditional academic journals often categorize AI research strictly within computer science, overlooking its transformative impact on scientific discovery. IJAI4S aims to bridge this gap by providing a dedicated platform for high-quality interdisciplinary research that integrates AI with scientific challenges. This journal fosters innovation by accepting both applied AI research in scientific domains and fundamental AI algorithmic developments with scientific relevance. It upholds rigorous academic standards through a double-blind peer review system, ensuring contributions meet the highest levels of scientific integrity, reproducibility, and impact. As an open-access journal, IJAI4S is committed to broad knowledge dissemination, enabling researchers worldwide to access and build upon published findings freely. With a vision to become a leading journal in AI for Science, IJAI4S actively promotes international collaborations, organizes conferences and workshops, and recognizes outstanding contributions through annual best paper awards. By fostering a dynamic research community, the journal aims to accelerate AI-driven scientific advancements and shape the future of intelligent research methodologies. We invite scholars from diverse disciplines to submit their work and collaborate in driving forward the integration of AI in science.

Keywords: AI for Science, Interdisciplinary Research, AI Applications, Machine Learning for Science, AI-driven Scientific Innovation.

1. Introduction

1.1. The Era of Artificial Intelligence (AI)

In recent years, the rapid development of artificial intelligence (AI) technology has profoundly impacted numerous scientific fields [1], [2]. From physics, chemistry, and biology to medicine, environmental science, and remote sensing, AI has significantly advanced scientific research with its powerful data processing, pattern recognition, and predictive capabilities [3]. Today, AI not only optimizes experimental workflows and enhances data analysis efficiency but also uncovers complex patterns that traditional research methods may fail to detect [4]. For instance, deep learning techniques have been employed to study quantum systems and optimize experimental design in physics [5], while in medicine, AI has improved early cancer detection accuracy through the analysis of vast medical imaging datasets [6].

As AI becomes increasingly prevalent in scientific research, more researchers are focusing on its innovative applications across various disciplines [7]. However, despite AI's immense potential to drive scientific advancements, many traditional academic journals still classify AI research strictly under computer science

rather than applied science [8]. Consequently, numerous studies on AI applications in science are rejected as ”out of scope,” preventing this interdisciplinary research from gaining the visibility and recognition it deserves.

1.2. The Necessity of Establishing IJAI4S

To address this challenge, we have founded the International Journal of Artificial Intelligence for Science (IJAI4S) to fill the publication gap in AI for Science research and provide a high-quality academic platform for AI researchers and scientists worldwide. The core objectives of IJAI4S include:

Bridging the gap left by traditional academic journals regarding AI for Science research. While conventional computer science journals primarily focus on AI technologies, applied science journals often lack a deep understanding of AI methodologies, leading to the neglect of high-quality interdisciplinary research.

Promoting the integration of AI across different scientific fields. AI technology is breaking down disciplinary barriers, and IJAI4S is committed to fostering AI applications across physics, chemistry, biology, environmental science, medicine, and other disciplines.

Enhancing the transparency and reproducibility of AI for Science research. Many AI applications in science suffer from a lack of openness and reproducibility, which affects the reliability and generalizability of research findings [9], [10]. IJAI4S encourages authors to provide detailed algorithmic codes, experimental data, and reproducibility guidelines to improve research credibility.

Ensuring high-quality peer review to uphold academic value and innovation. As an emerging interdisciplinary field, AI for Science requires reviewers with expertise in both AI and scientific disciplines to ensure the scientific contribution and methodological soundness of published papers.

Facilitating widespread dissemination of AI for Science research. IJAI4S adopts an Open Access publication model, ensuring that researchers worldwide have unrestricted access to the latest AI for Science advancements, thereby accelerating knowledge sharing and academic collaboration.

1.3. Opportunities and Challenges in AI for Science

Although AI applications in scientific research have yielded remarkable progress, they still face numerous challenges. For instance, in environmental science, machine learning is used to predict climate change and analyze pollution data [11], yet AI predictive models are constrained by data quality, computational costs, and interpretability issues [12], [13]. In medicine, AI-assisted diagnostics have made breakthroughs, but ensuring the reliability and explainability of AI-driven diagnosis systems remains a major concern [14], [15]. Additionally, ethical considerations, data security issues, and computational resource limitations pose further challenges to AI applications in scientific research.

Nevertheless, AI for Science remains one of the key trends in future scientific advancements. By providing a dedicated academic platform for AI applications in science, IJAI4S aims to propel this field forward, foster global research collaborations, and accelerate innovations in AI-driven scientific research.

In the following sections, we will introduce the scope, features, editorial board, and submission and review processes of IJAI4S to help researchers better understand the journal’s positioning and objectives.

2. Background and Objectives of the Journal

2.1. The Evolution of AI in Scientific Research

The intersection of artificial intelligence and scientific research has undergone significant transformation over the past decade [16]. Initially, AI was primarily developed for automation and decision-making tasks in the fields of business, technology, and engineering [17]. However, as machine learning and deep learning techniques have advanced, AI has become an indispensable tool in scientific discovery, enabling researchers to tackle complex problems that were previously beyond human capability.

The rise of AI in scientific research can be attributed to several key factors:

Big Data Availability: The exponential growth of scientific data, facilitated by advancements in sensors, experiments, and simulations, has created a need for AI-driven data analysis and pattern recognition.

Computational Advancements: The increasing power of GPUs and cloud computing has made it possible to train and deploy sophisticated AI models capable of handling large-scale scientific computations.

Algorithmic Innovations: Breakthroughs in deep learning, reinforcement learning, and probabilistic models have enabled AI systems to outperform traditional methods in various scientific tasks, including drug discovery, climate modeling, and materials science.

Despite these advancements, AI for Science still faces significant challenges in terms of interpretability, generalizability, and ethical considerations. Many AI applications remain black-box models, making it difficult for scientists to understand and validate their predictions. Additionally, AI's reliance on large datasets raises concerns about data biases and the reproducibility of scientific findings.

2.2. The Purpose of IJAI4S

The International Journal of Artificial Intelligence for Science (IJAI4S) was founded to address the challenges and opportunities presented by AI in scientific research. The journal aims to:

Provide a Platform for AI for Science Research: Unlike traditional AI-focused journals that emphasize theoretical advancements in machine learning, IJAI4S focuses on the practical applications of AI in solving real-world scientific problems.

Encourage Cross-Disciplinary Collaboration: By bringing together AI researchers and domain experts from various scientific disciplines, the journal promotes collaboration that leads to innovative and impactful discoveries.

Ensure Scientific Rigor and Reproducibility: IJAI4S upholds high publication standards by requiring authors to provide transparent methodologies, open-source code, and reproducible experimental results.

Support Open Access Knowledge Sharing: The journal follows an Open Access model to maximize the accessibility of cutting-edge research findings to scientists, policymakers, and industry professionals worldwide.

Address Ethical and Societal Implications of AI: As AI becomes increasingly integrated into scientific research, IJAI4S encourages discussions on the ethical, legal, and social impact of AI-driven discoveries, ensuring responsible AI usage.

IJAI4S seeks to establish itself as a leading journal in the field of AI for Science, fostering an ecosystem where AI methodologies and scientific innovations converge to accelerate the advancement of human knowledge.

3. Scope of the Journal

3.1. Research Coverage

The IJAI4S journal is dedicated to publishing research on the applications of artificial intelligence across various scientific disciplines, as well as fundamental AI algorithms and their scientific applications. The specific research areas covered include, but are not limited to:

3.1.1. Applications of Artificial Intelligence in Scientific Research

- AI for Physics
- AI for Chemistry
- AI for Biology
- AI for Environment
- AI for Security
- AI for Mathematics
- AI for Medicine & Healthcare
- AI for Satellite & Remote Sensing
- AI for Finance
- AI for Big Data & Cloud Computing

3.1.2. Core AI Algorithms and Their Applications in Science

- Machine Learning
- Deep Learning
- Reinforcement Learning

- Computer Vision
- Natural Language Processing
- Statistical Learning Methods

3.2. Types of Papers

The journal accepts the following types of papers:

- **Research Articles**: Present novel AI methods or innovative applications of AI in scientific fields.
- **Review Articles**: Summarize and analyze the latest advancements in AI applications within specific scientific domains.
- **Technical Reports**: Introduce new AI tools, frameworks, or systems and explore their practical applications in scientific research.

IJAI4S aims to be a leading academic platform in the field of AI for Science, fostering deep integration between artificial intelligence and scientific research while promoting collaboration and innovation between academia and industry.

4. Features of the Journal

4.1. Multidisciplinary Scope Covering AI Applications in Various Scientific Fields

IJAI4S is committed to fostering interdisciplinary research by publishing studies that explore the application of artificial intelligence across a wide range of scientific domains, including but not limited to physics, chemistry, biology, medicine, environmental science, and engineering.

4.2. Acceptance of Fundamental AI Algorithms and Their Scientific Innovations

The journal welcomes research that not only applies AI methods to scientific problems but also contributes to the development of fundamental AI algorithms with potential scientific impact. This includes advancements in machine learning, deep learning, reinforcement learning, and statistical modeling that enhance scientific discoveries.

4.3. High-Quality Peer Review Mechanism to Ensure Research Integrity

To maintain the highest academic standards, IJAI4S employs a rigorous peer-review process. Each submission undergoes evaluation by experts with backgrounds in both AI and the relevant scientific disciplines, ensuring that published research meets criteria for innovation, scientific contribution, and methodological soundness.

4.4. Promotion of Transparency and Reproducibility in AI for Science

IJAI4S advocates for transparency in AI research applied to scientific studies. Authors are encouraged to provide open-source code, datasets, and detailed methodological descriptions to enhance reproducibility and facilitate future research advancements.

4.5. Open Access Model for Broad Research Dissemination

As an Open Access journal, IJAI4S ensures that published research is freely accessible to the global scientific community. This model enables wider dissemination of AI-driven scientific innovations, promoting knowledge sharing and accelerating advancements across various fields.

5. Editorial Board Members

5.1. Editors-in-Chief

5.2. Advisory Editors

- **Prof. Xingfa Gu**, Academician of the International Academy of Astronautics (IAA), Academician of the International Eurasian Academy of Sciences (IEAS), Guangzhou University, China
- **Prof. Jinnian Wang**, Academician of the International Academy of Astronautics (IAA), Guangzhou University, China
- **Prof. Yongzhang Zhou**, Academician of the Russian Academy of Engineering (RAE), Academician of the Russian Academy of Natural Sciences (RANS), Sun Yat-sen University, China
- **Prof. Kun Yang**, The Ministry of Education of China "Yangtze River Scholars Program" Distinguished Professor, Yunnan Normal University, China
- **Mr. Vincent Wong Wai Sang**, Chairman of MH Technologies Sdn Bhd, Malaysia

5.3. Associate Editors

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- **AI for Environment**: Dr. Zhenyu Yu, Universiti Malaya, Malaysia
- **AI for Mathematics**: Dr. Pei Wang, Kunming University of Science and Technology, China
- **AI for Medical**: Dr. Kun Wang, Kunming University of Finance and Economics, China
- **AI for Healthcare**: Dr. Wenbin Zhang, Florida International University, USA
- **AI for Big Data**: Dr. Yiwu Xu, South China University of Technology, China

5.5. Editorial Board Members

- **Associate Prof. Hanqing Chen**, Guangdong Ocean University, China
- **Dr. Liqiang Jing**, University of Texas at Dallas, USA
- **Dr. Wenbin Zhang**, Florida International University, USA
- **Dr. Changhao Wu**, University of Birmingham, UK
- **Dr. Qiulin Li**, City University of Macau, Macau, China
- **Dr. Muhammad Fayaz**, Sejong university, South Korea
- **Dr. Tianhui Li**, University of Aizu, Japan
- **Dr. Hanyang Chen**, Rajamangala University of Technology Krungthep, Thailand
- **Dr. Shipra Shivkumar Yadav**, Marwadi University Rajkot Gujarat India, India
- **Dr. Yiwu Xu**, South China University of Technology, China
- **Dr. Lizhi Liu**, Chinese Academy of Forestry, China
- **Dr. Xiao Kang**, Shandong University, China
- **Dr. Yueqiao Wu**, Capital Normal University, China
- **Dr. Kun Wang**, Kunming University of Finance and Economics, China
- **Dr. Tian Wang**, Nanjing University of Science and Technology, China
- **Mr. Shixiang Zhao**, Baidu Online Network Technology, China
- **Mr. Peng Liu**, SDMC Technology Co., Ltd., China

5.6. Technical Editors

- **Dr. Pei Wang**, Kunming University of Science and Technology, China
- **Dr. Zhenyu Yu**, Universiti Malaya, Malaysia

6. Manuscript Submission and Peer Review Process

6.1. Submission Methods

Authors can submit their manuscripts through the official journal website or via email. Detailed submission guidelines, including manuscript formatting and required documents, are provided on the journal's official platform.

6.2. Double-Blind Peer Review System

IJAI4S employs a rigorous double-blind peer review process, ensuring that both authors and reviewers remain anonymous throughout the review process. This system enhances objectivity and fairness in evaluating submissions.

6.3. Manuscript Evaluation Criteria

Submitted manuscripts are evaluated based on the following criteria:

- **Innovation**: The novelty of the AI methodology or its scientific application.
- **Scientific Contribution**: The significance of the research in advancing AI-driven scientific discoveries.
- **Technical Depth**: The robustness of the methodology and implementation.
- **Reproducibility**: The clarity of the methodology, availability of data, and potential for replication by other researchers.

6.4. Editorial Processing After Acceptance

Once a manuscript is accepted, it undergoes further editorial processing, including language polishing, formatting, and final proofreading to ensure high-quality publication. Authors may be required to provide additional clarifications or minor revisions before final publication.

6.5. Publication Model

IJAI4S follows an open-access publication model, ensuring that all published research is freely accessible to the global scientific community. The journal is published periodically, with new issues released according to the journal's established publishing schedule.

7. Journal Impact and Future Development

7.1. Objective

IJAI4S aims to establish itself as a leading journal in the field of AI for Science, serving as a premier academic platform for publishing high-quality research that bridges artificial intelligence and scientific discovery.

7.2. Future Plans

To achieve this goal, the journal will focus on the following strategic initiatives:

- **Building an International Academic Collaboration Network**. Establishing partnerships with top universities, research institutions, and AI-focused academic societies to foster collaboration and knowledge exchange.
- **Organizing AI for Science Conferences and Workshops**. Hosting annual conferences, symposiums, and workshops to bring together leading experts and researchers in the field of AI-driven scientific research.
- **Establishing an Annual Best Paper Award**. Recognizing outstanding research contributions with an annual best paper award to encourage innovation and excellence in AI for Science.
- **Attracting High-Quality Submissions to Increase Impact Factor**. Implementing targeted outreach efforts to attract groundbreaking research, ensuring the journal's continuous growth and influence in the academic community.
- **Indexing in Prestigious Academic Databases**. Working towards inclusion in major academic indexing databases such as Scopus, EI (Engineering Index), and SCI (Science Citation Index) to enhance the journal's visibility and impact in the global research community.

8. Conclusion

8.1. Vision and Mission of the Journal

IJAI4S is committed to advancing the intersection of artificial intelligence and scientific discovery. By providing a dedicated platform for high-quality research, the journal seeks to drive innovation, foster

interdisciplinary collaboration, and contribute to the broader scientific community. Our mission is to bridge the gap between AI methodologies and real-world scientific challenges, ensuring that AI-driven solutions are effectively integrated into various scientific domains.

8.2. Contribution to AI Researchers and Scientists

IJAI4S serves as a valuable resource for AI researchers and scientists by:

- Offering a prestigious venue for publishing pioneering research in AI for Science.
- Promoting transparency, reproducibility, and open-access dissemination of scientific knowledge.
- Encouraging the development and application of AI-driven methodologies that push the boundaries of scientific discovery.
- Facilitating networking and collaboration among experts from diverse scientific disciplines.

8.3. Invitation for Global Scholars to Submit and Collaborate

We warmly invite scholars, researchers, and practitioners from around the world to contribute to IJAI4S. Whether through submitting groundbreaking research, participating as reviewers, or collaborating on editorial initiatives, we welcome your engagement in shaping the future of AI for Science. Together, we can advance knowledge, drive innovation, and build a thriving global research community dedicated to AI-driven scientific progress.

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Biographies

Zhenyu Yu received her Ph.D. degree in Geographic Information Systems (GIS) in June 2022. She is currently a researcher at Universiti Malaya. Her research interests include AI for Science, Computer Vision, Remote Sensing, Machine Learning, and GIS. She serves as a program committee member for IJCAI, contributing to the review and selection process of high-quality research in artificial intelligence. She has published over 30 papers in top international conferences and journals, such as AAAI, WR, WRR, and JOH.

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Mohd. Yamani Idna Idris Professor at Universiti Malaya, has been a faculty member since 2000, contributing over two decades to education, research, and innovation. His expertise includes the Internet of Things (IoT) and image processing, with significant advancements in computer vision and pattern recognition. He has published extensively in reputed journals and successfully supervised 25 Ph.D. candidates. Beyond research, he serves as a reviewer and editorial board member for journals such as Pattern Recognition and IEEE Transactions on ITS and actively participates in grant evaluation panels and Ph.D. examinations worldwide. He has held key leadership roles, including Head of Department and Deputy Dean, driving research and academic excellence. His contributions have earned him multiple Excellence Service Awards and recognition among Stanford's Top 2% Scientists in 2024.