

The eeXiv Whitepaper

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ABSTRACT

In this paper, we present eeXiv, an open-source, open-access project hosted by Team 1280 EECS (“Electrical Engineering and Computer Science”), independent of the department of the same name at UC Berkeley. We aim to rival arXiv as the single largest open-source and open-access research paper repository and as the largest research paper repository on the West Coast, transforming San Ramon Valley High School into a tier-1 research institution. Similar to arXiv, we host electronic preprints and postprints (known as e-prints) approved for posting after a rigorous peer review process. Our repository consists of scientific papers in the fields of mathematics, physics, astronomy, electrical engineering, computer science, quantitative biology, statistics, mathematical finance, and economics, with a focus on papers specific to the FIRST Robotics Competition. eeXiv bypasses the traditional bureaucracy of research publication, which involves lengthy peer review processes and journal approval, by enabling “libre” and “open” publication, dissemination, and consumption of research artifacts.

1 Introduction

Many people in academia, particularly those in STEM fields, are well-acquainted with the arXiv repository, hosted by Cornell University. arXiv [1] (pronounced “archive”—the X represents the Greek letter χ) enables free online access to most research papers—regardless of peer review status—in a multitude of scientific disciplines. eeXiv (pronounced “EECS-iv”) aims to replicate many of the key goals of the arXiv project and implement a locally managed research repository database in the San Ramon Valley of California, sponsored by the Electrical Engineering and Computer Science (EECS) group of Team 1280 Robotics, based in San Ramon Valley High School (SRVHS). Unlike arXiv, eeXiv *does* have a peer-review process, but this process relies on open-source contributors and volunteer experts who donate their time to the

curation of our repositories, thus expediting the traditionally lengthy peer-review process through crowdsourcing techniques, in a similar manner to applications like Amazon’s Mechanical Turk. [2]

1.1 In this paper

The purpose of this paper is primarily to introduce eeXiv from the ground up, as a new tool for researchers and consumers of research, and to compare eeXiv to similar applications, particularly arXiv. We will also discuss briefly the development process, role of volunteer peer-reviewers, and future project goals.

Contributions. The idea behind eeXiv was first proposed by SRVHS academic Ananth Venkatesh and later refined by fellow SRVHS colleague and criminal mastermind Youwen Wu. The first mockup of the eeXiv system, created by Ananth

Venkatesh, is retained in a branch of the main repository [3], which now has a proper implementation of the eeXiv system as designed by Youwen Wu [4].

2 Understanding eeXiv

eeXiv is perhaps the single largest and most impactful project ever undertaken by Team 1280 Robotics “The Ragin’ C-Biscuits” of SRVHS. Within the robotics team, the newly-formed Electrical Engineering and Computer Science (EECS) group decided to embark on this epic quest to secure for our team the Blessings of Liberty [5] and an open repository for the storage and retrieval of vital research documents. EECS looked to the pioneer in digital research cataloging, arXiv, as a basis for the new eeXiv system, which trades the “arX” in arXiv for “eeX,” pronounced “EECS” as a tribute to its creators. The goals of the eeXiv project are audaciously bold and unapologetically revolutionary. In this section, we attempt to describe to the uninitiated the purpose of a universal, open-access and open-source research repository, and what the role of eeXiv is in enabling such a repository.

2.1 eeXiv nomenclature

In this section, we break down several key terms that are crucial to understanding the eeXiv system and other research repositories.

preprint. fully written paper submitted for review, regardless of review status

postprint. research paper that has successfully passed at least rudimentary review, regardless of publication status

e-print. electronically-published *preprint* or *postprint*

open-access. content that is free both in cost and in thought (“libre”) for everyone to download, analyze, and redistribute

open-source. content that allows, encourages, and actively relies upon contributions from community members

tier-1 research institution. highest research rating by the Carnegie Classification of Institutions of Higher Education

2.2 The research database

At the core of eeXiv is a centralized, optimized, and comprehensive database of metadata for all e-prints and their revisions ever published or catalogued on our site. This database does not contain the source files for each revision—these are stored separately and served through a versatile and external Content Delivery Network (CDN) to ensure low download times regardless of user location. The eeXiv research database allows analysis of all papers published to our platform, including the automatic creation of citations, analysis of revision histories, and author profiles. In this sense, the research database is critical to supporting eeXiv academia and researchers all over the world. It provides a single source of truth for all research publications and their connections, enabling researchers and analysts to quickly search for relevant papers in a multitude of scientific disciplines. An advantage of storing only the *metadata* of catalogued documents as opposed to their plain text contents is that the process of searching through even millions of documents can be completed locally in a fraction of a second, enabling search engine speeds on inconsistent hardware.

2.3 Peer-review process

What truly separates eeXiv from related applications is its unique peer-review process. eeXiv fulfills the role of both a research repository and traditional scientific journal, while following commonly-accepted standards for and being certified as neither. To merge these two typically disparate functions into a single application, eeXiv relies on a network of peer reviewers,

also referred to as “volunteer contributors,” to parse through eeXiv’s massive research output (equivalent to several institutions of higher education combined) and provide quality feedback on preprints, error correction for postprints, and overall quality control to ensure the best articles are promoted in search results and other application functions.

Comparison with traditional peer-review. Similar to scientific journals, eeXiv relies solely on “volunteer contributors” who are luminaries in their respective fields of study, drawing on the best of the best to prune through a dynamic, ever-changing wall of content and greatly reduce time to publication.

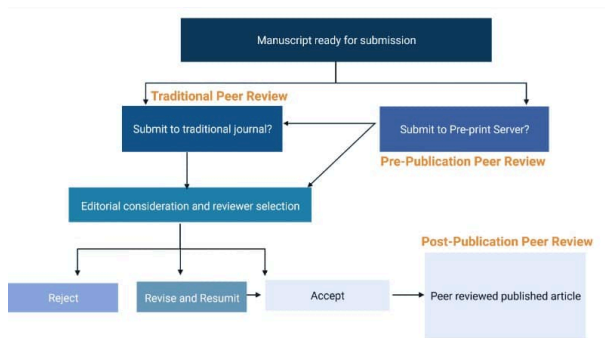


Figure 1: An overview of the traditional peer review process, with a separate branch representing the augmentation of this process by traditional research repositories

Role of research repositories. As can be seen in **Fig. 1** [6], online repositories for research (which typically publish pre-prints) allow readers to access articles prior to the official acceptance or revision process that occurs when articles are brought up for consideration in a journal. eeXiv, by contrast, merges the preprint process into the existing review pipeline, allowing a streamlined process from preprint to post-print that reduces review time by relying on a network of peer-reviewers.

Holding the bureaucracy accountable. In the United States, the bureaucracy is traditionally held accountable through various means, among

them the controversial use of executive orders by the President and congressional oversight. Both of these processes suffer from obvious issues; executive orders tend to evoke authoritarian politics and congressional oversight is corrupted by the “revolving door” and “iron triangles” with industry [7].

Academic bureaucracies. As with government, academia suffers many of the same problems of bureaucratic bloat and inefficient resources and processes to address them. One of the most frustrating parts of the academic bureaucracy, particularly in research publication, is the process of peer, scholarly, and journal review. Each of these processes is carried out by faceless organizations, often in a “single blind” or “double blind” fashion, thus lacking transparency and accountability [8]. As a result of these issues, the review process can often take months, much too long considering the rate at which research output is produced and made accessible online [9]. Additionally, even with this lengthy review process, research is often wrought with inaccuracies and inconsistencies, which has already led to the resignation of two presidents [10], [11] at tier 1 “research universities.”

Democratizing research. Journals and other bureaucratic entities are governed by their own rules, much like the executive branch of the United States government remains tied to the Deep State. “Draining the swamp” in the context of academia means restructuring peer-review for an online-first world where speed and transparency are prioritized and plagiarism and authenticity are mere societal constructs. eeXiv’s decentralized, crowdsourced, and adaptable peer review structure enables faster, more transparent, and democratized publication of more research papers, advancing the woke Diversity, Equity, and Inclusion (DEI) agenda that has taken higher education by storm [12] while also disseminating research at a faster rate than ever before.

3 Related Work

The flagship example of a system similar to the proposed eeXiv application described in this paper, and the system that eeXiv is based on (both in name and in substance) is the arXiv research repository, hosted by Cornell. arXiv’s description of its platform is given below [13]:

arXiv is a curated research-sharing platform open to anyone. As a pioneer in digital open access, arXiv.org now hosts more than two million scholarly articles in eight subject areas, curated by our strong community of volunteer moderators.

arXiv touts the largest collection of e-prints of any research repository in the world, recruiting researchers from a broad range of services: article submission, compilation, production, retrieval, search and discovery, web distribution for human readers, and API access for machines, together with content curation and preservation.

Comparison of internal governance. arXiv operations are maintained by the arXiv Leadership Team [13] and arXiv staff at Cornell University. This inherently leads to woke tendencies in academia [12] influencing article selection. Additionally, arXiv does not free researchers from the bureaucratic maze of publication, but instead only adds electronic pre-prints as an option for those whose papers have not been reviewed. eeXiv, on the other hand, relies on a network of peer-reviewers and a constant stream of submissions which are both reviewed and published, eliminating the need for any journal or special interest to interfere with original research.

Comparison of hosting strategies. Registered users may submit articles to be announced by arXiv. There are no fees or costs for article submission. Submissions to arXiv are subject to a moderation process that classifies mater-

ial as topical to the subject area and checks for scholarly value. Material is not peer-reviewed by arXiv—the contents of arXiv submissions are wholly the responsibility of the submitter and are presented “as is” without any warranty or guarantee [13]. eeXiv takes a different approach, carefully vetting papers but also publishing non-traditional research artifacts, including code (in the form of executables and tarballs) and drawings. eeXiv commentary is strictly objective and does not classify papers by topic (except for searching), instead seeking to solicit a broad range of opinions on various academic disciplines from a community of scholars. eeXiv thus lowers the bar for publication while increasing publication quality.

Comparison of cataloging. arXiv catalogs are poorly maintained and, though searchable, lack the sophistication and depth of the eeXiv knowledge base. A key difference between arXiv and eeXiv is that eeXiv, due to its large network of researchers and scholars, is able to create a wiki-like knowledge base to track not just papers and authors, but also topics, institutions, author affiliations, and more. This is a constantly growing knowledge base that better contextualizes articles for readers and greatly increases application ease of use, while improving search functionality.

4 Future Work

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5 Notes on Crowdsourcing

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fastidium. Non est omnino hic docendi locus; sed ita prorsus existimo, neque eum Torquatum, qui hoc primus cognomen invenerit, aut torquem illum hosti detraxisse, ut aliquam ex eo est consecutus? – Laudem et caritatem, quae sunt vitae sine metu degendae praesidia firmissima. – Filium morte multavit. – Si sine causa, nollem me ab eo delectari, quod ista Platonis, Aristoteli, Theophrasti orationis ornamenta neglexerit. Nam illud quidem physici, credere aliquid esse minimum, quod profecto numquam putavisset, si a Polyaeo, familiari suo, geometrica discere maluisset quam illum etiam ipsum.

6 Conclusion

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