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Qeios

Peer Review

Review of: "Explaining the Unexplainable: A Systematic Review of Explainable AI in Finance"

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General Assessment

The article explores an important and timely subject — the application of Explainable Artificial Intelligence (XAI) in financial contexts. It acknowledges the growing concern over the interpretability of AI systems and attempts to provide a comprehensive overview of the research landscape. However, while the author's intention is commendable and the topic relevant, the methodology lacks the rigor expected from a systematic literature review. The paper falls short in adhering to established scientific methodologies for conducting literature reviews, such as those proposed by **Webster & Watson (2002)** and **Fettke (2006)**. This omission affects the paper's reproducibility and credibility.

Strengths

- **Topic Relevance**: The subject of XAI in finance is of great significance and aligns well with both academic and practical interests.
- **Literature Scope**: The attempt to review 323 articles indicates a broad survey of the field.
- **Structuring into Streams**: Categorizing the literature into thematic streams is a logical approach that aids in understanding trends and gaps.

Major Critiques and Suggestions

1. Methodological Weakness

- **Absence of Structured Methodology**: The review lacks grounding in recognized frameworks for literature reviews. Incorporating methods like **Webster & Watson (2002)** or **Fettke (2006)** would provide transparency in the selection and synthesis process and should be clearly documented.

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- **Selection Criteria**: The filtering process from 5,763 to 30 papers lacks explanation. Why were 5,733 papers excluded? What criteria were used?
- **Inclusion of Use Cases**: Including financial use cases like credit scoring or fraud detection in the initial search query would have enhanced relevance and narrowed the scope effectively. Studies like [DOI: 10.1007/s10462-024-10854-8] could be cited for this purpose.

2. Figures and Visual Representations

- **Figure 1**: Offers no new insight beyond the adjacent paragraph. Consider removing it or significantly enhancing its content.
- **Figure 2**: The quality and aspect ratio are poor. This must be improved for readability and clarity.
- **Figure 3**: Fails to provide a concrete differentiation between white-box and black-box models. It needs refinement to clarify decision-making levels and technical boundaries.
- **Figure 4**: Picture resolution is too low and must be optimized.
- **Figure 5**: No added value is apparent. Consider eliminating it or reworking it to provide deeper insights.
- **Figure 11**: While potentially valuable, its insights are underdeveloped. Each stream shown should be linked to specific implications and future research directions. Justification for these associations is necessary.

3. Table Usage and Review Process Transparency

- **Table 2 Placement**: As it currently stands in the appendix, Table 2 provides limited utility. It should either be clearly explained in the text or integrated into a process diagram summarizing the review steps.
- **Lack of Review Progress Figure**: There is no PRISMA-like flow diagram showing article screening, exclusion rationale, and categorization — this is standard in systematic reviews and should be included.

Additional Recommendations

- **Terminology Consistency**: Clearly define and consistently use terms like “explainability,” “interpretability,” “transparency,” and “trust” to avoid conceptual overlap.
- **Practical Insights**: Engaging with practitioners or referencing grey literature could enhance the practical relevance of the findings.

Final Verdict

- **Decision**: Accept with **major revisions**
- **Justification**: The paper addresses a timely and important topic but lacks methodological rigor and presents several unclear or underdeveloped visual and analytical elements. Substantial improvements in structure, transparency, and visualization are necessary to enhance the article's scholarly value.

Declarations

Potential competing interests: No potential competing interests to declare.

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