Research Methods and Professional Practice (January 2025)
University of Essex
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Literature Review Outline

Title:

Implementing Machine Learning (ML) tools and/or techniques in Diabetes Diagnosis

Outline of literature review:

Abstract

Introduction:

- Types of diabetes overview.
- Challenges in traditional diagnostics.
- ML contribution to diabetes diagnosis.

Literature review:

1. ML techniques in diabetes diagnosis:

- Supervised learning.
- Unsupervised learning.
- Deep learning techniques.
- Hybrid models.

2. Data sources and pre-processing in diabetes diagnosis:

- Common data sources.
- Data pre-processing.
- Importance of data quality.

3. Applications of ML in diabetes diagnosis:

- Diabetes prediction modelling.
- Automated detection of diabetes symptoms.
- Wearables integration in glucose monitoring.
- Natural language processing in diagnostic.

4. Challenges and limitations:

- Concerns regarding high-quality labelled datasets and privacy.
- Interpretability and clinical integrity of ML models.
- Ethical concerns.

5. Case studies of ML adoption:

- Examples of successful cases in ML-based diabetes prediction (such as the work of Abu-Shareha (2024) and Al-Dabbas (2024)).
- Adoption of ML solutions by healthcare organizations.

5. Future directions:

- Improvements of algorithms' trust and interpretability.
- Technological integrity.
- Ethics and policy.
- Federated learnings.

Conclusions

References:

Abu-Shareha, A.A. (2024) ‘A framework for diabetes detection using machine learning and data preprocessing’, *Journal of Applied Data Sciences*, 5(4), pp. 1654–1667. doi:10.47738/jads.v5i4.363.

Al-Dabbas, L. (2024) ‘Early detection of female type-2 diabetes using machine learning and oversampling techniques’, *Journal of Applied Data Sciences*, 5(3), pp. 1237–1245. doi:10.47738/jads.v5i3.298.