CMSC 691 - Software Engineering for AI-Enabled Systems
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Healthcare AI Implementation Analysis: A Systematic Literature Review Protocol

1. Motivation

- This literature review seeks to analyze the current implementation and impact of artificial intelligence systems within healthcare settings. The investigation will examine how AI technologies are transforming medical practices, including diagnostic processes, treatment planning, and patient care delivery, while evaluating their effectiveness and practical implications for healthcare providers and outcomes.

2. Research Questions

- **RQ1:** What are the current implementations and applications of AI technologies across different healthcare domains?
- **RQ2:** How do AI-driven systems impact clinical decision-making and patient care outcomes?
- **RQ3:** What are the key challenges and success factors in implementing AI solutions in healthcare settings?

3. Data Sources and Search Strategy

- **Primary Databases:**
    - PubMed/MEDLINE
    - IEEE Xplore
    - ACM Digital Library
    - SpringerLink
    - Scopus
- **Search String:**
    - ("artificial intelligence" OR "machine learning" OR "deep learning") AND
    - ("healthcare" OR "medical" OR "clinical" OR “patient outcomes” OR “healthcare analytics”) AND
    - ("implementation" OR "application" OR "deployment" OR "integration")
- **Search Parameters:**
    - Time period: 2019-2025
    - Language: English
    - Document type: Peer-reviewed articles
    - Snowballing technique will be applied to included studies

4. Inclusion and Exclusion Criteria

- **Inclusion Criteria:**
    - IC1: Studies focusing on practical AI implementation in healthcare settings
    - IC2: Research presenting empirical evidence or case studies of AI applications

    - IC3: Papers discussing technical implementation details or deployment strategies
- **Exclusion Criteria:**
    - EC1: Non-peer-reviewed materials (books, keynotes, technical reports, theses)
    - EC2: Literature reviews or survey papers
    - EC3: Duplicate studies or similar papers by same authors
    - EC4: Theoretical papers without practical implementation
    - EC5: Studies not focused on healthcare applications
    - EC6: Grey literature, editorials, or opinion pieces

5. Data Extraction

A standardized data extraction template will be used to collect the following information:

- Basic Information:
    - Title
    - Authors
    - Year
    - Publication venue
- Implementation Details:
    - AI techniques used
    - Healthcare domain
    - Implementation scope
    - Technical infrastructure
- Outcomes:
    - Performance metrics
    - Clinical impact
    - Implementation challenges
    - Success factors

6. Data Analysis

- Quantitative Analysis:
    - Distribution of AI applications across healthcare domains
    - Temporal trends in implementation approaches
    - Success rate metrics
- Qualitative Analysis:
    - Common implementation challenges
    - Best practices and success factors
    - Implementation frameworks
    - Future directions

References [To be populated based on included studies]