

# A Scalable Architecture for Treatment Recommendations

This master's thesis project aims to address the growing need for scalable and efficient treatment recommendation systems in healthcare. With the increasing volume of medical data and the desire to provide personalized healthcare to patients, there is a critical demand for a robust and scalable architecture that can effectively generate treatment recommendations. The central research question is: How can we design and implement a scalable architecture for treatment recommendations that considers the complexity of patient data, the diversity of medical conditions, and the need for real-time responses?

This research project will involve the following key activities:

1. **Architecture Design:** Designing a scalable and modular architecture that can handle large volumes of patient data while ensuring high performance and real-time responsiveness.
2. **Data Integration:** Developing methods for integrating various sources of patient data, including electronic health records (EHRs), and textual data to create a comprehensive patient profile.
3. **Recommendation Models:** Integrate existing models that generate treatment recommendations, taking into account medical guidelines, patient history, and preferences.
4. **Scalability Testing:** Conducting extensive scalability testing to ensure that the architecture can handle increased data loads without compromising performance.
5. **Ethical Considerations:** Addressing ethical concerns related to data privacy, security, and fairness in treatment recommendations.

Expected outcomes of this research include a scalable architecture blueprint for treatment recommendation systems in healthcare, insights into the challenges and opportunities in this domain, and potential improvements in the quality of healthcare delivery through personalized treatment recommendations.

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Technical Requirements:

- Background in MLOps and cloud computing.
- Proficiency in programming languages like Python and experience with model deployment.
- Knowledge of database management and data integration techniques.
- Experience in working with large (healthcare) datasets and cloud computing platforms.
- Strong analytical and problem-solving skills.
- Ability to design and conduct experiments for performance evaluation.
- (desirable) Familiarity with healthcare data standards

References:

- Jinfeng Wen et al. “**Rise of the Planet of Serverless Computing: A Systematic Review.**” ACM Trans. Softw. Eng. Methodol. <https://doi.org/10.1145/3579643>. 2023.

