Project Title:

Smart Device Monitoring and Digital Health Management for Diabetes

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Project Abstract/Proposal Summary:

Diabetes is a significant global health challenge requiring effective management through continuous blood glucose monitoring (CGM), tailored interventions, and lifestyle adjustments. However, existing diabetes management models and datasets often lack integration and fail to address the distinct socioeconomic and cultural contexts of the Chinese population. This project aims to develop an AI-enabled framework for diabetes management tailored to this demographic by focusing on three objectives: (1) blood glucose prediction: Utilizing CGM data and other metrics for accurate prediction and monitoring; (2) adverse event prediction: Early detection of hyperglycemia and hypoglycemia for timely intervention; (3) personalized management strategies: Leveraging wearable devices and dietary data for individualized lifestyle recommendations. A multi-layered modeling approach will integrate CGM data with clinical information, dietary records, and wearable device metrics, supported by machine learning and advanced statistical algorithms to enhance prediction accuracy and optimize glycemic control strategies. By incorporating unique cultural and lifestyle factors, this study will be the first to combine CGM data, dietary records, and wearable device metrics in diabetes management while employing multi-tiered modeling for diverse data availability. The development of a tiered digital health management tool holds transformative potential, enabling real-time monitoring and delivering culturally sensitive, personalized healthcare solutions for impactful diabetes management.