Lifestyle Synchronization of Medullary Sponge Kidney Patients

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Despite its incurable nature, MSK Life Sync offers AI-driven support to manage Medullary Sponge Kidney (MSK) disease to enhance life quality for sufferers, including children. As highlighted by a healthcare survey in Egypt, there is a vital demand for accessible health monitoring technologies among lower and middle-income groups. This project seeks to provide these communities with the tools and knowledge for effective health management and disease prevention. A mobile application was developed for patients and doctors, featuring scanning, tracking, and chatting capabilities. Patients manage their health through the app, while doctors access patient data to monitor their progress. An AI model has been enhanced for accurately classifying kidney radiologic images, using real-case datasets from Radiopaedia. Additionally, a device with a Total Dissolved Solids (TDS) sensor for measuring urine salinity and a temperature sensor for system isolation has been integrated and connected to Google Firebase for real-time database updates. Furthermore, a chatbot within the app provides immediate responses to inquiries about kidney diseases. The system underwent thorough experimentations, demonstrating a high validation accuracy exceeding 90% with the generation of lifestyle instructions, ensuring a system response within 5–7 seconds. This study presented a system for MSK management with a device embedded in TDS and temperature sensors for condition monitoring, coupled with Firebase for cloud storage and an AI model for kidney imaging classification within a mobile application with high diagnostic accuracy and quick responses. Future goals include manufacturing a portable device and collaborating globally to improve chronic kidney disease care.

Awards Won:
Fourth Award of $500