Gharsa: A Multimodal RGB - Thermal Deep Learning Tool for Plant Disease Detection

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Plant diseases, particularly fungal infections, cause significant crop losses worldwide due to delayed detection and limited access to rapid diagnostic tools. This project presents Gharsa, an AI-powered mobile application designed to enable fast and accessible plant disease detection using smartphone images. Users capture or upload plant leaf images, which are analyzed by a deep learning model that provides disease dentification, treatment guidance, and educational resources. To improve safety and reliability, the system includes an "unknown" classification when model confidence is ow, reducing the risk of incorrect diagnoses.The proposed advancement introduces a nultimodal detection approach that integrates RGB and thermal imaging to identify plant stress and early disease symptoms before they become visually apparent. The system is designed to support multiple plant species and diseases while remaining scalable for real agricultural environments. By combining artificial intelligence, therma sensing, and mobile technology, Gharsa aims to enhance early detection, support farmers' decision-making, and reduce crop losses.

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