

Artificial Intelligence Based Chatbot for Solar Panels Quality Assurance

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Abstract. *The rapid development of solar energy systems has increased the need for efficient testing and maintenance solutions to ensure long-term performance and reliability. Traditional quality assurance processes for solar panels can be time-consuming, resource-intensive, and open to human error, causing challenges for both installers and manufacturers. Advances in artificial intelligence (AI), particularly large language models (LLM) development, offer a promising solutions for enhancing the sustainability of solar panels. This paper explores the implementation of an AI based chatbot system designed to support the testing and quality assurance of solar panels, focusing on the needs of both installers and manufacturers. The Chatbot's domain includes protocols for performance testing, identification of common failures, and guidelines for extending the operational lifespan of solar panel systems. This research uses RetrievalAugmented Generation (RAG) to incorporate those domain-specific data. Chatbot is implemented in two low-code platforms: Promptly and Flowise AI. Developed AI based system aims to automate technical support, provide recommendations for testing, detect frequent failure points, and offer maintenance advice that would lead to an increase in diagnostic efficiency and maintenance effectiveness.*

Keywords. Solar panels, chatbot system, artificial intelligence, large language models, quality assurance

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