

# **Solar Tracker for Mobile Charging**

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**Abstract:** *This project is a dual-axis solar tracker for effective mobile phone charging with renewable energy. The system adjusts the position of the solar panel automatically to optimize sunlight absorption, enhancing energy efficiency. It employs LDR sensors to monitor sunlight and servo motors to manage panel orientation. A temperature sensor checks the heat levels of the phone to ensure that charging is suspended in case of overheating, thus maintaining battery health. Moreover, a charge time estimation algorithm determines the charge time remaining for a full battery based on real-time battery voltage and current. The system shows vital parameters like battery percentage, charge state, temperature, and estimated charge time on an LCD display. Powered by an ESP32 microcontroller, this intelligent solar tracker optimizes charging efficiency, safety, and reliability, with applications in off-grid locations, outdoor environments, and renewable energy solutions.*

**Keywords:** Dual axis, renewable energy, smartphone charging

