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(57) Abstract :

The present invention discloses a compact holographic projection device comprising a chassis, tri-wavelength laser array, spatial light modulator, beam-steering mirror, diffuser, depth camera, gesture sensor, processor, wireless module, and battery. It enables real-time volumetric image projection without eyewear and supports touch-free gesture-based interaction. Adaptive laser-power regulation ensures eye safety, while passive graphene-based cooling ensures silent operation. The device also offers wireless synchronization across units, making it suitable for immersive, collaborative data visualization in educational, medical, industrial, and analytical environments.

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