

# Estimation of Total Suspended Solid Concentration and Turbidity in Environmental Water Bodies using A Smartphone

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**Abstract**—This paper demonstrates a cost-effective and field-portable smartphone based optical device for rapid estimation of suspended particle concentration in environmental water bodies and drinking water. The working of the proposed sensor is based on Nephelometric Mie-scattering of incident light beam from an infra-red LED micron size suspended particles in the liquid medium and intensity of the scattered beam is measured by the proximity sensor of the smartphone. Using the designed sensor suspended particle concentration ranging from 100-3000mg/L and its surrogate measure water turbidity from 0.1NTU-400NTU has been measured accurately and reliably. We envision that the proposed technique could emerge as a handheld, highly inexpensive sensing tool for water turbidity monitoring of different environmental water bodies.

**Keywords:** Smartphone, proximity sensor, infra-red LED, Mie-Scattering theory, turbidity.