

Indigenous Fiber Bragg Grating Interrogation System for SHM

Breif Background

Monitoring strain in structural elements such as beams, columns, slabs, bridge decks, and even in landslide-prone areas is essential for sustainable infrastructure and timely deterioration detection. Fiber Bragg Grating (FBG) sensors are well-suited for such measurements as deformations cause measurable shifts in Bragg wavelength, which can be read using an optical interrogator. However, current FBG interrogators are expensive, bulky, and mostly imported. Therefore, this project aims to develop an indigenous, compact, and cost-effective FBG interrogator based on the Czerny-Turner configuration to support India’s structural health monitoring needs.

Tech/Prod. Summary

An indigenous optical interrogator system for measuring the Bragg shift, which has applications in strain-sensing in buildings, bridges, landslides, defense, etc.

Tech/ Product Description

This FBG interrogator replaces costly optical components like CCDs and beam splitters with a scanning spectrometer and reflective grating, significantly reducing system cost and size. The resulting photocurrent signals will be captured using semiconductor devices and can be remotely accessed, stored, and utilized as a structural health data repository for engineers and researchers

Market Potential

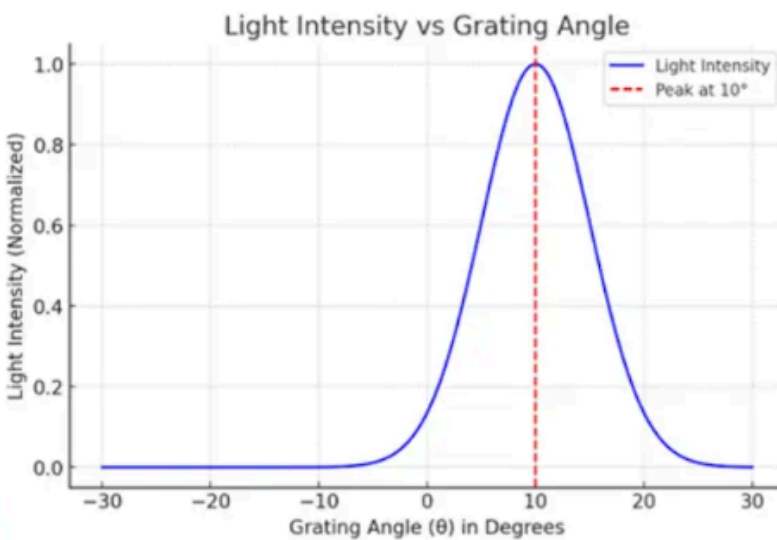
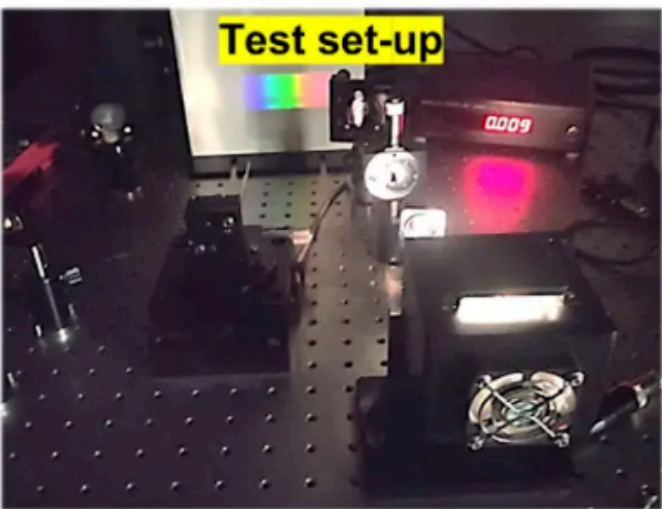
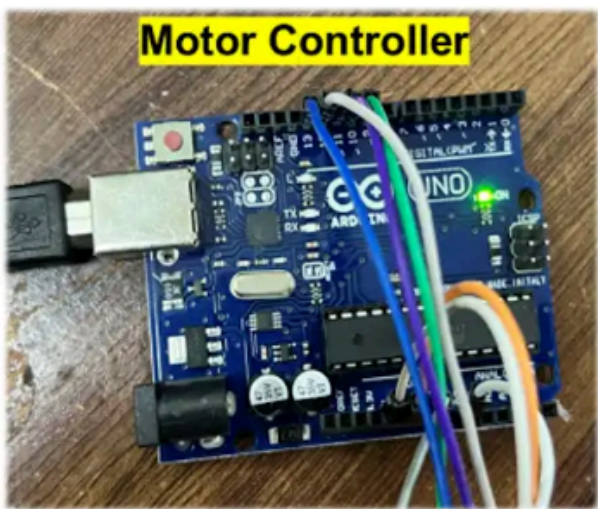
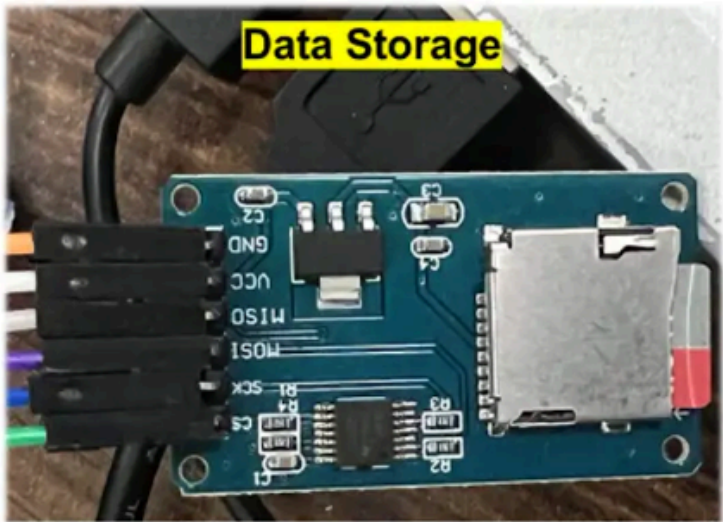
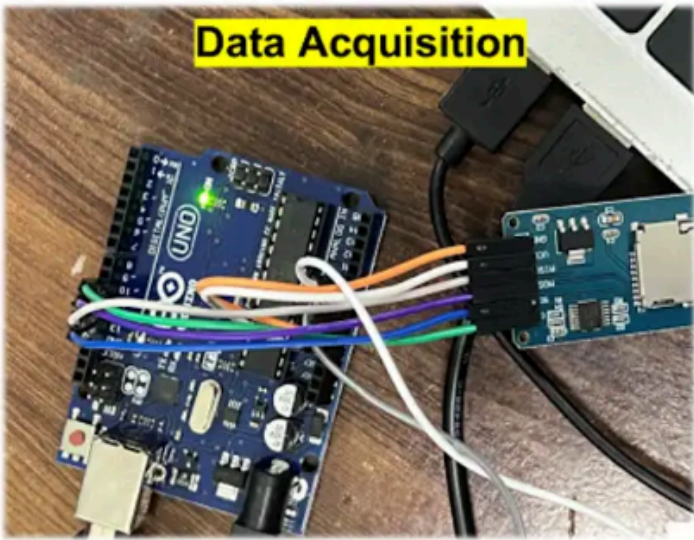
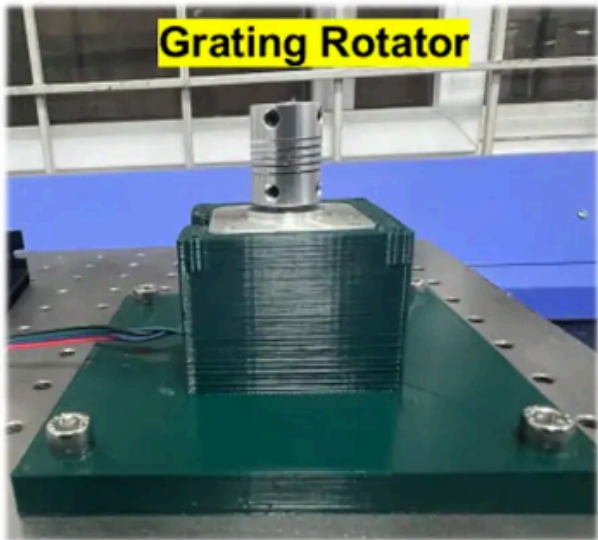
Photonic sensor
Market: USD 17.3 Billion in 2023 → USD 36 Billion+ by 2030 (CAGR 11-12%)

Value Proposition

- a) Low cost,
- b) Compact, and
- c) Indigenous

Impact - SDG:

SDG 9 – Industry, Innovation and Infrastructure
SDG 13: Climate (Indirectly)



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