Title: Real-Time Structural Health Monitoring of Mine Shafts Using Fiber Optic Sensing

Abstract: The structural integrity of underground mine shafts is paramount for operational safety. This project proposes the implementation of a real-time structural health monitoring (SHM) system using distributed fiber optic sensing (DFOS) technology. By embedding fiber optic cables into the shaft lining, the system will continuously measure strain and temperature changes, providing an early warning of potential ground convergence, cracks, or structural fatigue. The data will be fed into a predictive model to assess structural health and schedule preventative maintenance, thereby reducing the risk of catastrophic failure.