# ABSTRACT

Landslides pose significant socio-economic threats to areas whose geography favors them. Currently existing landslide monitoring methods and techniques are characterized by significant limitations both in technical terms (quality and frequency of data) and in terms of usability (high inferred costs, requirement of very high expertise). In this work we present an innovative landslide monitoring system that leverages state-of-the-art IoT technologies. The system consists of a set of autonomous sensing devices equipped with a sensor suit specifically tailored for monitoring landslides. The devices take sensory measurements at frequent intervals - while operating at a very low duty cycle - and transmit them over the SigFox network to a data server powered by ELK stack for curation and visualization. The system has been successfully deployed in a landslide site at Bournemouth, UK providing the local authorities with a new means of efficient and remote monitoring. The system follows a modular scalable architecture and has been proven to be highly reliable. As a result, there are plans for its use to be extended to other parts of the Bournemouth area as well as of the UK.

**Keywords**— Internet of Things, SigFox, landslide

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**LIST OF ABBREVIATIONS**

EDM Electronics Distance Measurement

IOT Internet of things

ELK ElasticSearch, Logstash and Kibana

WSN Wireless Sensor Network

GPRS General Pocket Radio Service

SVM Support Vector Machine

CCD Charge Coupled Device

3D Three Dimension

DTS Distributed Temperature Sensing

DB Data Base

GPS Global Positioning System

SNNS Sensing Node Network System

WSNS Wireless Sensor Network System

IMU Inertial Measurement Unit

MB Moving Block

DEB Deep Earth Probe

MQTT Message Queuing Telemetry Transport

JSON Javascript Object Notation