ABSTRACT

The extraction of minerals from the earth has been an essential element in the development of human society since the dawn of civilization. After hundreds of years of mining, the more accessible shallow mineral resources are being depleted, and some have now been completely exhausted. This means that the economic exploitation of more of the earth's deeper mineral resources is now required in order to meet society's growing demand for minerals leading us to underground mining. The activities carried out in order to obtain these minerals from the underground mine has dangerous element in them. The increased exposures of underground mine workers to poor air quality and high temperature in underground mines has caused a lot of health problems such as serious respiratory diseases, lung damage, reduce resistance to infections, increase fatigue and many others to the worker. Therefore, the real time system is developed to monitor and control underground mine air condition. And these was done by designing and developing hardware subsystem and a web-based application for monitoring and controlling underground mine air environment condition. The system has therefore resulted into reduction on the exposures of workers to contaminants in the underground, the mine workers are able to know the appropriate time to return to the mine after blasting, and alerting miners within the underground mine when the concentration level of the contaminates exceeds the threshold value. We concluded that the developed system addresses the major gaps that have been existing in maintaining underground mines' health working conditions. This happens through keeping track of the mine pollutant levels and controlling their concentrations by varying the air flowrate plus producing warning signals for worst conditions automatically by this system. On top of that, this system offers insight of the current contaminant concentrations in the mine to personnel who would wish to enter the mine through display of these values on a mega computer screen on the ground station and on the local crystal display (LCD).

Keywords: controlling, monitoring, underground mining, minerals, extractions, concentration, contaminants, threshold values.

DECLARATION.

I, **OLOYA JERRY,** registration number **BU/UG/2016/1728,** declare that this project proposal report is my original work and has never been presented to any university or institution for the award of a bachelor's degree in mining engineering or any other related award.

Signature: …….

Date: …….

APPROVAL.

This is to certify that the project report entitled '**Real-Time System for Monitoring and Controlling Underground Mine Environment'** has been done under the supervision of the lecturer mentioned below and is ideally submitted for examination assessment.

Mr. NUWAREEBA EDSON

Signature: ……

Date: …….

DEDICATION.

I am very grateful to the Almighty God for the guidance and good health he has provided to me and for enabling me reach this year of study.

Sincere appreciations to my supervisor Mr. Nuwareeba Edson for his continuous effort in guiding me through proposal writing. May God bless you.

I would like to thank the staff in the department of Mining and Water Resources engineering Busitema University especially Mrs. Nangendo Jacqueline, Mr. Nasasira Michael and Mr. Nuwareeba Edson for their guidance and support during my study and these writing.

I would also like to thank my parents, brothers, sisters and friends for their financial, emotional support during this period. May the lord reward you.

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LIST OF ACRONYMS

CO Carbon monoxide

CO2 Carbon dioxide

CSS Cascading Styles Sheets

FY Financial Year

HTML Hypertext Markup Language

IDE Integrated development environment

PHP Hypertext Preprocessor

PPM Parts per million

SQL Structured Query Language

WAMP Windows Apache MySQL PHP

PID Proportional Integral Differential

IDE Integrated Development Environment

mg/m^3 micrograms per cubic meters