

Grant AFC215-13

Title: Enhanced Ground Control Assessment for Improving Safety in Mine Design

Organization: University of Kentucky

Principal Investigator(s): Zacharias Agioutantis

Partnerships: Appalachian Mining and Engineering Inc
Cardno Inc

Focus Area: Health and Safety Interventions

Topical Area: Ground Control

Problem Statement and Justification: Over the last 20 years, NIOSH has developed and validated a number of free software tools addressing safe coal mine design with respect to ground control. These tools have been designed as stand-alone PC based software packages. As cloud computing gains momentum, many engineering applications have been converted to work through a distributed or cloud environment. Clearly there is a need to move forward with mine design computer tools and update their utility and application by placing them in a distributed environment. The vision behind this proposal is to fulfill this need and create a software platform which can ultimately embrace several tools used by mining professionals under a common roof. Such information will then be available anywhere and at anytime through the power of distributed or cloud computing, even while underground. Data will be safely stored and preserved in database servers at operations headquarters, applications will not need to be updated on PC-based computers and users will not have to deal with compatibility issues. Web applications will be available to multiple platforms through the respective web browsers.

Impact of the Research: This new web-based product (webGroundControl) will allow for faster and easier access to existing ground control designs, on-the-fly calculations in the field if needed, and instant online collaboration between planning personnel and operations engineers. This shared working platform will ensure more transparent calculations in cases of variable conditions as well as the instant recognition of problematic areas under a specific design. It is expected that the industry will rapidly embrace this product and, as it is common with all new innovative technologies, it will be a new paradigm for mining engineering computer applications. Furthermore it is expected that upon the completion of this project, the need will emerge to populate this platform with additional tools and packages.

Objectives and Research Approach: A new software product (webGroundControl) will be developed by fulfilling the following objectives: (a) to develop a server-side module for the new web-based software product; (b) to develop a web browser module; (c) to generate web-based help files for the above products; (d) to develop an installer and a quick reference guide that will include step-by-step instructions on how to install and/or uninstall the product; and (e) to disseminate and publish the results in a number of US based conferences. The outcomes or deliverables include: (a) server and browser-side modules for the new web-based software product; (b) a web version of ALPS; (c) a web version of ARMPS; (d) a web version of ARBS; (e) web-based help files for the above products; (f) an installer package that will seamlessly install the software; (g) Quick reference guides for the above products that will include step by step instructions; and (h) at least three peer-reviewed publications.