Computer Vision Technology – HATCH Mine Vision

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# ABSTRACT

Construction projects in the mining sector frequently face delays, with over 80% of projects exceeding their schedules and averaging 43% over budget. A significant factor contributing to these overruns is workforce productivity challenges, stemming from limited visibility into actual versus planned workforce activities in shafts and underground construction areas. This directly impacts companies’ ROI. Additionally, current manual and paper-based tracking systems are outdated and error-prone, hindering real-time decision-making in project management.

Computer vision technology provides a modern solution for mining project managers, offering real-time measurements and actionable insights into workforce productivity. It focuses on critical, operationally constrained areas with high workforce utilization, such as underground mining cages. The software identifies tasks being performed, tracks task duration and count, and supports the identification of safety risks. Including a dashboard that delivers real-time productivity insights to help project managers maintain project timelines and budgets.

This technology offers significant short- and long-term benefits for mining construction projects. In the short term, enhanced monitoring improves daily operational productivity by focusing on critical activities and reducing inefficiencies. It also increases the accuracy of work plans, supports effective activity execution, and reduces reliance on manual surveillance, allowing teams to concentrate on higher-value tasks.

Over the long term, this technology sustains increased productivity, minimizes project deviations, and reduces the risk of overruns. It helps identify underperforming areas and develop plans to address them, enhances project estimation accuracy and planning for better financial outcomes, and improves asset utilization and safety practices on-site, leading to overall better project performance. Despite the unique conditions in mining, such as low light, dust, heat, and humidity, there is ample evidence that computer vision can be successfully applied in this context.

Video analysis for tracking performance and diagnosing productivity challenges in mining projects has yielded positive results. For instance, a study on cage utilization revealed significant deviations between actual and planned usage. Over a two-month testing period, there was a 120% reduction in personal movement within the cage. Additionally, this technology is already well-established in sectors such as automotive and security.