Effective risk mitigation with Computer Vision AI

Salman Chaudhary* looks at why Computer Vision AI delivers a step change for Health & Safety managers where traditional approaches are achieving diminishing returns.

The aluminium extrusion industry has grown significantly in recent years and world market forecasts show this is set to continue. However, the process of extruding high-quality profiles is not without its challenges and although some health & safety issues are common to all manufacturing sectors, other are specific to this industry. The physical hazards include heat, noise and airborne pollutants, operation of mobile equipment, lifting devices, combustion, and high voltage equipment, as well as the handling of bath and molten metal. Pulmonary hazards are significantly higher in workers who are continuously exposed to gases and pollutants for more than 8 hours a day.

It is important that a long-term view of health & safety is taken in the metals sector because of the extended lag times for many occupational diseases between exposure and onset. This is especially so with pulmonary diseases that may take decades to manifest, whereas a system that verifies that users are, for example, wearing correct PPE, such as respiratory equipment, can cut the risk dramatically.

Wellbeing of personnel is important in all businesses; according to research by McKinsey, more than 60% of all workers, including those in the manufacturing sector, reported inadequate safety in their workplace when considering all factors. In fact, more than half of the respondents have concerns regarding their physical health in the workplace.

A technology-based approach to health & safety in the aluminium sector using Computer Vision AI has the ability to address both physical safety and wellbeing of workers.

Computer vision AI

Artificial Intelligence (AI) powered Computer Vision is rapidly becoming a technology that is having the single largest impact on workplace safety and productivity. Anything that requires round the clock monitoring, or frequent manual inspections, or involves repetitive tasks, is a good candidate for Computer Vision AI.

Integrated into on site CCTV, Computer Vision AI is able to carry out real-time monitoring and detecting of any non-compliance of social distancing, correct PPE/mask usage and occupancy guidelines. Immediate, configurable notifications and email alerts on any type of safety violation are built into systems such as our WorkSafe Analytics (WSA), allowing prompt actions on ensuring the well-being of the workforce. Metrics outputted show a range of visual prompts including hourly % violations, average distance between people, pictorial evidence of non-compliance, daily alerts and section-wise trends. This approach can be used for a wide range of applications in the aluminium sector, ranging from checking that workers are wearing respiratory masks, safety helmets and ear defenders through to head counts and monitoring COVID social distancing rules.

AI within the health & safety sphere works by feeding the software with information about all the elements depicted in the image and which are relevant. The capabilities of AI means that it 'learns' to identify the point of interest via Computer Vision, for example, a respirator is being worn, and will outperform even the most experienced health & safety professionals in identifying potential risks. Humans, will, of course, be the ultimate decision makers, meaning the technology is used as an augmented intelligence that is capable of raising alerts whilst relinquishing health & safety operatives from the monotonous task of collecting data from the workplace.

Collecting data is only part of the story. What you do with the data counts just as much. Our approach is to contextualise and visualise the data in meaningful and actionable insights that not only make workplaces and staff safer, but also engrain a health & safety culture.

Case file:

We recently deployed our Computer Vision AI WorkSafe solution in a manufacturing site. The system, which leverages existing surveillance / security assets, comprises indoor cameras covering control rooms, engineers' offices, and operators field offices, and outdoor cameras covering workshops, product/bag loading area, and entrance gates.

The Computer Vision AI carries out employee headcount at the entrance gate, whilst at the product loading area it conducts bag counts. Uses in the workshop and plant operating areas include PPE compliance and asset monitoring.

As well as enabling a safe return to full productivity after the COVID lockdown, WSA provides the management team with rapid and targeted insights into areas that require improvement.

A step change in H & S performance

The aluminium industry, in common with many other manufacturing sectors, has consistently improved injury rates over the past 15 years. However, new technologies like Computer Vision AI present new opportunities and, where Health & Safety Managers feel they are achieving diminishing returns on traditional health & safety strategies, Computer Vision AI has the potential to deliver a step change.

AI works best when it is designed and 'trained' to accomplish specific tasks, such as workplace health & safety. The technology is now at a stage where it can teach machines to be better than humans in these areas, particularly for monotonous tasks. These are predominately analytical in nature, so visual observation of staff social distancing or wearing of PPE such as eye and face protection, along with logical decision making on when to sound an alert.

Computer Vision AI software can provide more accurate and comprehensive monitoring of safety hazards and health and safety compliance. This will not only reduce operating costs and unplanned shutdowns at Aluminium plants, but also enable workforces to feel more confident, translating into greater productivity. ■

To find out more about EmpiricAI and WorkSafe Analytics.
visit: www.empiric.ai

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ABOUT EMPIRICAI

Founded in 2018, EmpiricAI is an innovative provider of AI-powered advanced analytics solutions aimed at industrial process engineers and health & safety professionals. Our software solves business challenges from improving operational performance, reducing costs, improving productivity and reliability, to minimising health and safety risks at work.

Our team of industrial engineers, health & safety experts, data scientists, and software engineers develop innovative applications that empower our clients to leverage their data for actionable insights and immediate outcomes. https://empiric.ai/