

2017 CETI Award for SmartHat 4.0 (Self-monitoring Alert and Response Technology for Hazard Avoidance and Training)

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Thousands of construction workplace deaths occur worldwide every year causing loss of lives, significant collateral damages, and severe tragic consequences to many families. While slips, trips and falls account for about one third of all fatalities in many of the developed countries, equipment is involved in about 25% of all fatal cases. Reasons are often attributed to personal behavior or poorly planned and/or inadequately provided work environments. Few technological means are available to date that rigorously assist in the safety planning effort, allow workers to recognize and report hazards, and provide personalized feedback.

For a long time have the construction industry leaders in safety been focusing on “zero accidents” and other best practices in corporate safety. These have successfully changed organizational culture, supervision, preconditions, and unsafe personal behavior. However, the same industry leaders are recognizing their safety records are not improving any more as fast as they like. This challenge comes to an industry that is known in public to be highly fragmented and slow in applying innovation. It seems existing approaches have made their impact.

Jochen Teizer and Mario Wolf, researchers at the Ruhr-University Bochum in Germany are expecting that significant improvements can be gained in construction safety once technology is applied to existing safety practices. They have been researching BIM-based automated safety rule checking to detect and eliminate hazards before construction starts, remote sensing and Internet of Things (IoT) approaches that provide workers with (near) real-time feedback, and other technology to objectively measure, analyze, and visualize unsafe work behavior. Latter contribution, for example, is used in predictive analytics and has turned into novel processes for personalized education and learning. Some of their research and development has already inspired commercial products.

The impact for the construction industry is clear: As the construction industry accounts for a large amount of the yearly gross domestic products and employments in most countries, a key message might be that advances in emerging technologies offer substantial opportunities to improve construction safety while help meeting other national challenges, such as becoming more efficient in executing work tasks. Thus, investing in construction safety and specifically targeting some of the most critical objectives in a construction projects’ lifecycle will directly impact a project’s bottom line. As empirical industry studies report “safe jobsites are also productive”, research yet has to prove it.

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