

Human Factors as the Main Reason of the Accident in Scaffold Use Assessment

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Abstract : Main goal of the research project is Scaffold Use Risk Assessment Model (SURAM) formulation, developed for the assessment of risk levels as a various construction process stages with various work trades. Finally, in 2016, the project received financing by the National Center for Research and development according to PBS3/A2/19/2015–Research Grant. The presented data, calculations and analyzes discussed in this paper were created as a result of the completion on the first and second phase of the PBS3/A2/19/2015 project. Method: One of the arms of the research project is the assessment of worker visual concentration on the sight zones as well as risky visual point inadequate observation. In this part of research, the mobile eye-tracker was used to monitor the worker observation zones. SMI Eye Tracking Glasses is a tool, which allows us to analyze in real time and place where our eyesight is concentrated on and consequently build the map of worker's eyesight concentration during a shift. While the project is still running, currently 64 construction sites have been examined, and more than 600 workers took part in the experiment including monitoring of typical parameters of the work regimen, workload, microclimate, sound vibration, etc. Full equipment can also be useful in more advanced analyses. Because of that technology we have verified not only main focus of workers eyes during work on or next to scaffolding, but we have also examined which changes in the surrounding environment during their shift influenced their concentration. In the result of this study it has been proven that only up to 45.75% of the shift time, workers' eye concentration was on one of three work-related areas. Workers seem to be distracted by noisy vehicles or people nearby. In opposite to our initial assumptions and other authors' findings, we observed that the reflective parts of the scaffoldings were not more recognized by workers in their direct workplaces. We have noticed that the red curbs were the only well recognized part on a very few scaffoldings. Surprisingly on numbers of samples, we have not recognized any significant number of concentrations on those curbs. Conclusion: We have found the eye-tracking method useful for the construction of the SURAM model in the risk perception and worker's behavior sub-modules. We also have found that the initial worker's stress and work visual conditions seem to be more predictive for assessment of the risky developing situation or an accident than other parameters relating to a work environment.

Keywords : accident assessment model, eye tracking, occupational safety, scaffolding

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