Human Behavior under Fire Situations – A Case-Study in the Portuguese Society

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Abstract

Among possible emergency situations, those that very likely will mostly affect human behavior are the ones related to fire, due to the many reasons associated with its initiation.

The forecast of the human behavior in the reply to a fire situation requires an integrated system that involves the people, the building and the fire. It is expectable people will answer differently to distinct and varying fire situations, which will depend on a diverse range of factors.

This paper summarizes a case-study on the human behavior under fire situations, based on the analysis of data collected through a questionnaire, applied to the Portuguese population nationwide. There were 14 questions related to fire, to which 225 answers were obtained. Within these 225 answers, 50 originated from people that actually experienced or were involved in a fire situation.

The study was already able to point out some trends in the behavioral analysis. However, it is not ready to fully support the development of a simulation model capable of estimating the pre-movement time. With this purpose, other questionnaires are being designed, which will be associated with results gathered from the observation of a number of real-life simulated evacuation scenarios.

Closing the methodological approach devised in this work, and in order to implement validation and calibration techniques, a simulation software tool is being implemented, which combines the state-of-the-art concepts of multi-agent systems and serious games. These two concepts support the implementation of a virtual and interactive environment that will allow for subjects' behavior to be elicited and classified according to different user profiles.

The resulting behavioral patterns, together with results from the first part of this study, will feed the devised model to more accurately validate it.