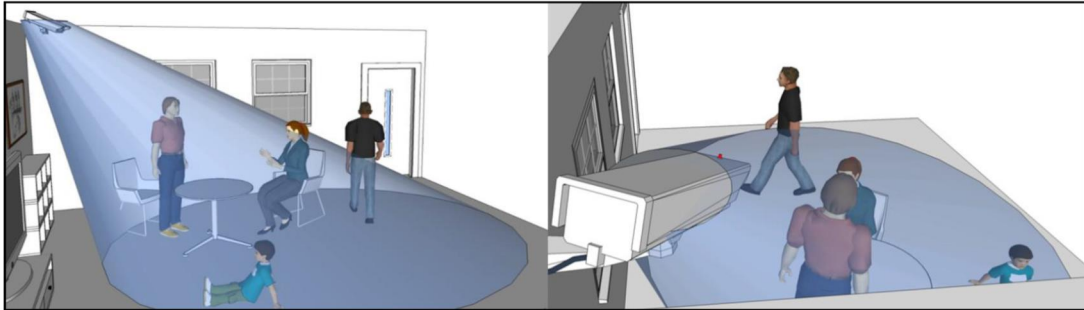


Design of an Automatic Hazardous Situations Detection Method

Host: Team MAGE (Modélisation et Algorithmique GEométrique)
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Keywords: image processing, machine learning, OpenCV, C/C++.

Context: This internship is offered as part of a project funded by the University of Haute-Alsace (UHA), entitled "optimal camera placement for automatic detection of hazardous situations". The results of this project can be highlighted through various applications: video surveillance of public places, detection of hazardous situations for the elderly with loss of autonomy (fall, dizzy spell, run away, etc).

Subject: The intern will have to address the problem of video surveillance of moving elements (people, vehicles, etc) to detect hazardous situations in a given space. The goal is to design a system that continuously processes the stream of video images transmitted by cameras. Using image processing techniques coupled with a classification method, this system will identify potentially hazardous situations in the image sequences. These situations will be characterized by shape descriptors (case of sudden change in the form of an element) and detection techniques (case of a sudden displacement of an element).

Furthermore, through machine learning techniques, the system will automatically improve its accuracy and the quality of its video image stream analysis. Indeed, the classification method used in the detection process will also update its settings and data, throughout its operation, to continuously reduce its classification error rate. The system will thus offer an increasingly better detection rate over time.

This continuous improvement in the accuracy of the system could lead to the full automation of the monitoring process, eliminating any human intervention to visually confirm the existence of a hazardous situation on an image, or an image sequence, transmitted by cameras.

Requested work:

1. Bibliographical study.
2. Development in C++ of the hazardous situation detection algorithms using OpenCV (segmentation methods, motion detection methods, etc offered by this library).

Internship gratification: Approximately 565 € / month (official amount fixed by public institutions)

Duration: 4 to 6 months

Contact: For more information or to apply (send a CV, a cover letter and the report cards containing all your marks obtained during your university studies), please send an email to julien.lepagnot@uha.fr.