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Multimedia Firearms Training System

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Abstract : The goal of the article is to present a novel Multimedia Firearms Training System. The system was developed in order to compensate for major problems of existing shooting training systems. The designed and implemented solution can be characterized by five major advantages: algorithm for automatic geometric calibration, algorithm of photometric recalibration, firearms hit point detection using thermal imaging camera, IR laser spot tracking algorithm for after action review analysis, and implementation of ballistics equations. The combination of the abovementioned advantages in a single multimedia firearms training system creates a comprehensive solution for detecting and tracking of the target point usable for shooting training systems and improving intervention tactics of uniformed services. The introduced algorithms of geometric and photometric recalibration allow the use of economically viable commercially available projectors for systems that require long and intensive use without most of the negative impacts on color mapping of existing multi-projector multimedia shooting range systems. The article presents the results of the developed algorithms and their application in real training systems.

Keywords : firearms shot detection, geometric recalibration, photometric recalibration, IR tracking algorithm, thermography, ballistics
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