SCIENTIFIC

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RE: Mech 45X Proposal: *Tool for Bullet Trajectory Estimate*

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It is my pleasure to be writing you with the intention of furthering our collaborative commitment to understanding "what happened?" and "how can we improve?" when Police Officers decide to use force in the line of duty.

Introduction

Shooting reconstructions are important for developing a more thorough understanding of what happened during a deadly force encounter. Often, an accurate reconstruction can confirm or deny various possible narratives of the events. Historically, obtaining bullet trajectories from bullet holes in various medium including the human body is a fruitful exercise during the reconstructions to obtain relative planer positions between the firearm and the medium in which the bullet passed. However, the error rate of current methods are large and variable across calibre size, shot medium, and incident angle. Hence, we seek a new method to reduce the error of bullet trajectory estimates.

Brief Project Description

Supplying the design group with methodology literature (attached) we hope that the student group can come to understand the potential short falls of current methods and either combine these methods or design a new method in order to reduce error of bullet trajectory estimates.

Expected Outcomes

A tool or method that reduces current error rates of bullet trajectory estimates from bullet holes. The tool or method can be a mixed model via physical technique and/or digital technique.

Resources Available from the Customer

A) Lead engineer who has performed multiple bullet trajectory analyses;

B) Up to $5000 for materials and project needs;

C) A physical trajectory analysis kit;

D) Software (3DF Zephyr, Cloud Compare, Photo modeler, Matlab, Zygote Body human factors, SolidWorks, AOS imaging studio, DOT3D edit, Inkscape, InputAce, PTLens, VSDC video editor).

E) Ability to create bullet holes in various medium necessary for study (ie. various firearms and ammunition);

F) DPI-10 Dot Product 3D scanner;

G) Various scientific equipment including data acquisition;

Sincerely,

Geoffrey T. DESMOULIN, Ph.D., R. Kin., Eng. L.

PRINCIPAL

Shooting Scene Documentation Methods
Online Course Reference List

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Laser Scanners

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