

Smart textile device for shooter's fingers movement monitoring

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ABSTRACT

BACKGROUND: The way how the shooters pull the trigger may significantly affect the shooter's results. Shooting coaches often are not able to detect incorrect pull because of gun movement during the shot and recoil.

OBJECTIVE: Development of the smart-textile based trigger pull monitoring system and demonstration of its ability to distinguish correct and wrong triggering techniques.

METHODS: Two separated knitted resistive pressure sensors were integrated over III and II phalanges in the index finger fingerstall; a single sensor was integrated over both III and II phalanges of the middle finger fingerstall. Resistance of the sensors was measured in a course of shots, performed by expert shooter, which simulated typical novice's trigger pull errors.

RESULTS: Sensors' resistance recordings were made for following erroneous trigger pull motions: pulling of the trigger with index finger's II phalanx instead of III; fast and jerky trigger pull (trigger tear-off); too fast release of the trigger after shot; and excessive grip force, applied by the middle finger. For each type of erroneous movement, recordings waveforms included distinguishable features, that characterised a particular type of error.

CONCLUSIONS: Developed trigger pull monitoring system provides signals, that could be used for recognition of the incorrectly performed trigger pull motions during gunshots.

KEYWORDS: motion capture, smart textile, shooting, shot triggering, finger pressure.