



G21 Project LifeMeters: A Digital Solution Optimizing Forensic Measurement Tools in Bitemark Analysis

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The goal of this presentation is to introduce a novel digital tool capable of capturing and creating life-size images of items present or physical injuries inflicted on a human body at a crime scene.

This presentation will impact the forensic science community by demonstrating methods to further digitize the processes involved in evidence conservation. By suggesting a concrete idea for such a tool, this presentation seeks to motivate the forensic science community to digitize more of the processes involved in evidence conservation.

It is a known fact that it can be a great challenge to accurately register bitemarks. Obstacles include poor quality photographs, not having a ruler handy, not knowing the real proportions of items, and using complex image processing software to manually improve image quality. Not having the proper tools available at the crime scene makes it impossible to perform a proper and accurate bitemark analysis, as precision must always be the benchmark of any forensic investigation.

Furthermore, time is of the essence when it comes to conserving the structure of a lesion on a human body before the healing process begins and improves the condition of the original wound. Also, in economically challenged countries around the world, forensic measurement tools such as the American Board of Forensic Odontology (ABFO) No. 2 forensic ruler may be difficult to obtain at a moment's notice, whereas a smart phone is nearly always available on demand.

In conclusion, the idea is to develop a mobile application capable of capturing life-size images of evidence at a crime scene with the scale of a digitally implemented forensic ruler calibrated by the user beforehand. Current devices on the market are unable to accomplish this due to their inability to scan object depth without infrared projectors, making 3D object capturing impossible. If there were hardware add-ons available on the market for mobile devices or if smart phone companies were able to integrate a hardware addition to their products, a mobile app would be able to calculate the exact size of an item. The app could also record the data of the captured image in a file format suitable for further processing. The automatized forensic analysis of an image could make a considerable contribution to the quality of the findings.

Project LifeMeters consists of two technical components. The software component includes an artificial intelligence module that tags specific objects or wound types automatically and provides this information in a report. The smart phone camera hardware component is used for 3D object capturing. The concept is plausible because there are already technologies, such as Google's® Project Tango or Occipital's Structure Sensor, that provide the camera features for smart phones performing instant measurements. There are already two smart phones on the market from Lenovo® and ASUS® with an integrated 3D camera. In addition, the scene recognition demo of the Massachusetts Institute of Technology demonstrates how precise current scene recognition systems are in defining objects within a crime scene.

Bitemark, Digitalization, Crime Scene