Automated clinical documentation software for emergency medical environments

VANDERBILT UNIVERSITY
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Summary

Vanderbilt researchers have developed a system to automatically detect different clinical procedures in order to prevent information loss through patient transfers in emergency situations.

Addressed Need

Patient information is vital in improving patient outcomes, but often this information is not fully communicated when the patient is transferred from emergency services to the hospital. Therefore, a need presents itself for a system that will augment information flow to reduce information loss and improve patient outcomes. This system must be noninvasive and automatically recognize clinical procedures being performed in real time, neither hindering the actions of medical personnel nor requiring any manual input.

Some current technologies are limited by the necessity of voice activation. Other human activity recognition algorithms equipped for procedure detection only detect CPR, not only limiting the ability to recognize medical procedures, but also meaning the software is unable to recognize different administered medicines without manual input.

Technology Description

An automatic clinical procedure detection system has been developed by utilizing computer vision and deep learning techniques. This technology requires no medical input but rather is able to recognize twenty-three different procedures through the use of wearable sensors, video, and machine learning. The algorithm can further measure a patient's triage level and alert the hospital before arrival, therefore reducing mortality rates.

Clinical Applications

Utilizing this system in emergency vehicles and hospitals will expedite the information pipeline between the two without the risk of loss and misinformation. Further, by evaluating patients' triage statuses, the risk of mortality is decreased and medical attention can be delivered more quickly.

Technology Development Status

A prototype has been deployed in the Nashville Fire Department. There is currently further development of the algorithm to detect a greater amount of clinical procedures. Journal Publication: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7153144/

Intellectual Property Status

Pending US patent application, copyrighted software and annotated data set for machine learning.

Fig 1: Still image taken from video data with OpenPose generated data overlain to create a skeletal representation of the patient and EMT. Video data is mixed with sensors worn by the EMT to determine the clinical procedure.

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