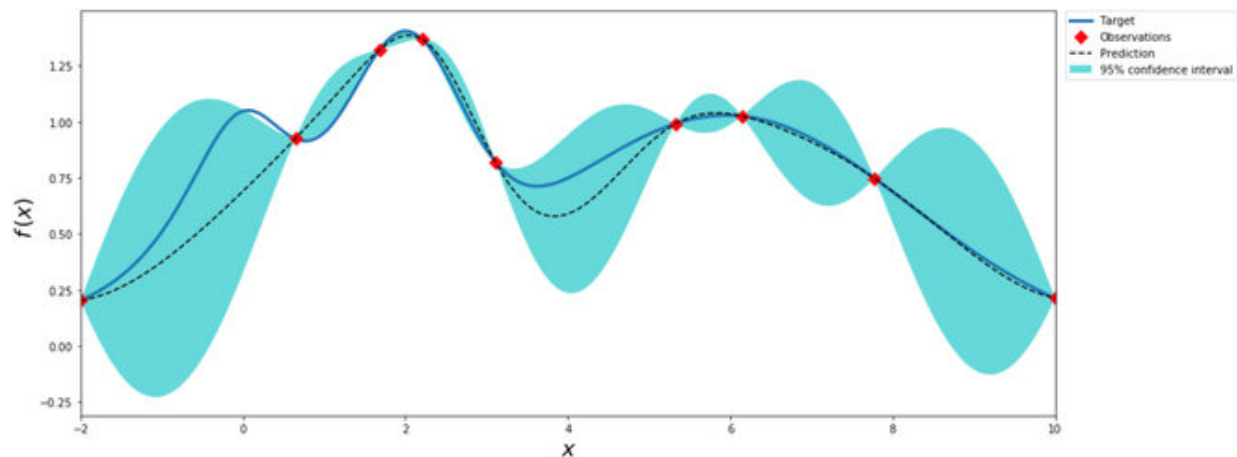# A machine learning model proves helpful in assisting emergency call triage

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An illustration of Bayesian optimization. Credit: *Health Data Science* (2023). DOI: 10.34133/hds.0008

A machine learning model has been proven effective as a decision-support tool for dispatchers of Emergency Medical Services (EMS), resulting in improved triage quality and ambulance utilization, according to a study done in Singapore.

This proof-of-concept study was recently published in *Health Data Science*.

Although protocols are available to guide decision-making, EMS

dispatchers still have difficulty determining the acuity of a case with the limited information they can gather in a brief call, compromising triage quality and resource utilization.

Accuracy of the EMS triage is a looming concern in cities with a growing and aging population yet a disproportional ambulance fleet. This can be helped by machine learning models, known to capture complex and subtle relationships, and well-trained data models can yield accurate predictions in a split of a second.

"We set out to solve the problem that ambulance dispatch triage has too many over-triage, which could result in overcrowding in the Emergency Department and waste of ambulance resources," shared Han Wang, a researcher at the National University of Singapore (NUS). "However, it is possible to use machine learning to improve triage performance among call center specialists."

To establish a desirable machine learning model that predicts the acuity of emergency cases, the team tapped 360,000 cases from the National Emergency Call Center in Singapore from 2018 to 2020. Using the same amount of information available to dispatchers, the trained model scored a 15% reduction in the over-triage rate and a similar under-triage rate compared to the current triage system.

This study stands out from the previous efforts where machine learning was not shown to improve dispatchers' ability to recognize cardiac arrest, or where the study methodology was withheld or less robust. In addition, it showcases a roadmap to other EMS systems worldwide as it demonstrates a method for processing EMS call center data and developing a machine-learning model.

"Our next step is to implement the system in the real world and compare the performance with a control group," commented Mengling Feng,

Assistant Professor at NUS. "This is the first study to optimize ambulance triage with [machine learning](). We hope it will inspire more research in this direction."

The research team is also open to sharing the details of the protocol and data, and such requests will be reviewed and approved by the EMS system of Singapore.

  More information: Han Wang et al, Building a Machine Learning-based Ambulance Dispatch Triage Model for Emergency Medical Services, *Health Data Science* (2023). [DOI: 10.34133/hds.0008]()

Provided by Health Data Science