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Continuous COVID-19 Symptom Monitoring Using Machine Learning

Inventors

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Researchers at Arizona State University have developed a system that employs machine learning (ML) to monitor symptoms of COVID-19 infections. Continuous symptom monitoring at home combined with machine-learning-based trend analysis can remove condition ambiguity and streamline the following processes: a) self-quarantine under medical supervision, b) allocation of critical care resources, c) integration of social network analysis with individual symptom progression, d) preparation for future outbreaks, and e) personalized decision-making on social distancing measures.

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With a mobile application, this system can improve and accelerate personal diagnosis and overall prognosis of viral infections that have high probability of community spread. Three types of sensor data can be recorded through the app: a) thermal camera data, b) color camera data, c) SpO2 data through mobile flash, and d) audio data obtained from a subject to determine symptoms of viral infection.

The data can then be used to: a) make an early decision about who has already contracted a viral infection, b) provide inputs on who and when to quarantine, c) make an informed decision on critical care priority, and d) identify potential subjects that may have been infected by the virus. By having the affected person self-monitor regularly (such as daily), machine learning is able to determine the best course of action such as whether the person should visit a medical facility or self-isolate.

A working demonstration of this system is currently available.

Potential Applications

- COVID-19 symptom monitoring
- Contagion spread analysis
- Medical triage

Benefits and Advantages

- Leverages machine learning to analyze individual COVID symptom trends as well as community-level risks
- Delivers actionable results for medical resource management
- Deduces possible asymptomatic COVID infections within a population

[Research Homepage of Profs. Sandeep Gupta and Ayan Banerjee](#)