

## **Symptom analysis using fuzzy logic for detection and monitoring of Covid-19 patients**

### **ABSTRACT**

Recent developments regarding the Internet of Things (IoT), Artificial Intelligence (AI), and Machine Learning (ML) opened new horizons of healthcare opportunities. Moreover, these technological advancements give strength to face upcoming healthcare challenges. One of such challenges is the advent of COVID-19, which has adverse effects beyond comprehension. Therefore, utilizing the basic functionalities of IoT, this work presents a real-time rule-based Fuzzy Logic classifier for COVID-19 Detection (FLCD). The proposed model deploys the IoT framework to collect real-time symptoms data from users to detect symptomatic and asymptomatic Covid-19 patients. Moreover, the proposed framework is also capable of monitoring the treatment response of infected people. FLCD constitutes three components: symptom data collection using wearable sensors, data fusion through Rule-Based Fuzzy Logic classifier, and cloud infrastructure to store data with a possible verdict (normal, mild, serious, or critical). After extracting the relevant features, experiments with a synthetic COVID-19 symptom dataset are conducted to ensure effective and accurate detection of COVID-19 cases. As a result, FLCD successfully acquired 95% accuracy, 94.73% precision, 93.35% recall, and showed a minimum error rate of 2.52%.