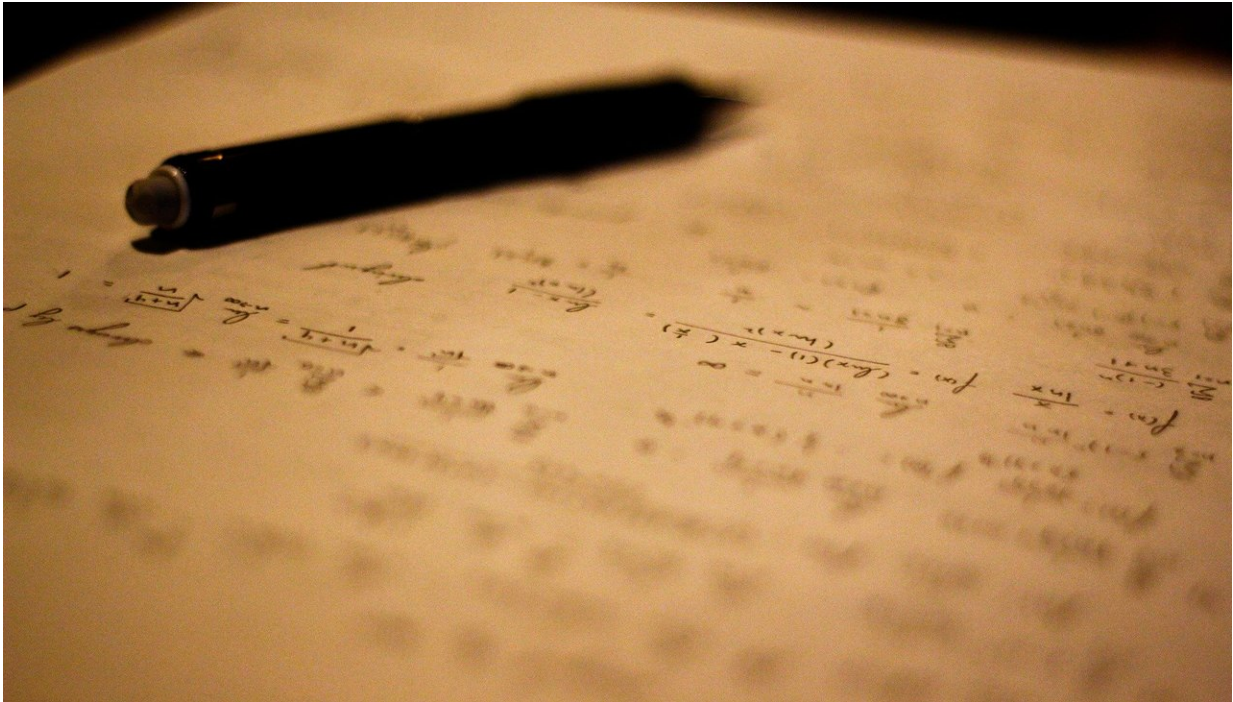


Predicting COVID-19 using 'fuzzy logic'

August 2 2021, by David Bradley



Credit: CC0 Public Domain

There is increasing pressure on society to test people in a timely manner for infection by the COVID-19 virus, SARS-CoV-2, but physical testing takes time and effort and requires people to either have a test kit at home or to attend a test center. The burden on testing equipment and infrastructure might be lessened if there were a simple non-physical way of screening people so that those who are very unlikely to be infected need not have a definitive physical test.

New work in the *International Journal of Intelligent Information and Database Systems* has turned to the concept of "fuzzy [logic](#)" to "test" people based on their symptoms to determine whether or not they have COVID-19 or not. This, of course, does not provide an answer as to whether a person is an asymptomatic carrier, but it would assist in helping a person or their healthcare worker decide on the next course of action based on their having this or another unrelated illness.

A fuzzy logic system (FLS) is an expert system that utilizes the theory of fuzzy sets that Zadeh laid out in 1965. The application of fuzzy logic allows a probability to be calculated with looser rules than one might assume with a statistical analysis based on different available criteria. It can output a confidence level to a diagnosis with a degree of certainty versus uncertainty.

The team concedes that at this stage in the research, their fuzzy logic model based on data publicly available bases and datasets is very much a prototype. There is no real way to distinguish the symptoms of COVID-19 from those of the common cold, pneumonia, or similar diseases based solely on reported symptoms. In order to boost the test's accuracy to a clinically useful level, additional symptomatic and epidemiological information about the patient's demographic and circumstances is now needed. This could then be fed into the fuzzy logic approach to adjust it based on probabilities. Moreover, in an area of high risk where there are many other confirmed cases, the uncertainty would be low.

Once the issues of accuracy and false positives and negatives are overcome through additional work, the team anticipates that a website or app might be made available to allow people to carry out a non-physical pre-medical [test](#) if they have symptoms to allow them to distinguish with confidence between the overlapping symptoms of other conditions and COVID-19 itself.

More information: Shadab Hafiz Choudhury et al, Predicting the possibility of COVID-19 infection using fuzzy logic system, *International Journal of Intelligent Information and Database Systems* (2021). [DOI: 10.1504/IJIDS.2021.116465](https://doi.org/10.1504/IJIDS.2021.116465)

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