In Search of a Pattern and Algorithmic Code for COVID-19: A Participant Self-Customized Awareness Systems for Diagnostics, Simulation, Tracing and Pattern Matching

Alireza Ebrahimi
School of Business
The State University of New York at Old Westbury
Old Westbury, NY, USA
ebrahimia@oldwestbury.edu

Abstract— The COVID-19 pandemic has become a challenge to our lives and affects us differently under certain circumstances. This project invites and assists participants in developing their awareness systems for COVID-19. The system comes with a set up consisting of standard information and the necessary coding explained to the participant. The findings are open and shared through an honor system. The awareness system consists of four embedded subsystems known as diagnostics systems, simulation, tracing, and pattern-matching systems. The diagnostic system uses inference rules to generate an outcome by diseases with the same symptoms related to COVID-19. The skeleton for the simulation system works as a game, depicting how the virus enters and interacts with the body's cells with different four scenarios such as involved in defeating the body's cell, defeating the virus, neutral coexistence of the virus and enclosure, and at best, turning into a positive virus. At that stage of defeating the body's cell, the virus will replicate itself by an assigned degree with a recursive behavior. The tracing system traces the COVID-19 and the participant's health using red, green, and blue (RGB) colors. The combination of RGB creates more than 16 million using 24 bits in binary or hexadecimal. The red color reserves for COVID-19, with 16 shades of red for a symptom with a 16 degree of severity. The pattern-matching system's skeleton provides four databases for asymptomatic, mild, severe, and fatal cases. The digitized information will quickly identify the pattern. One database may compare with another database for similarities or differences.

The transfer of learning from one system can flow into another, ultimately resulting in a solution pattern. This project's implication will guide others to initiate their participant system to find a way and formulate a solution.

Keywords— Public Education, Social Implications, Technology, COVID-19, Diagnostic System, Simulator, Contact Tracing, Knowledge Base, Pattern Matching Algorithm

INTRODUCTION

The COVID-19 pandemic has become a challenge and takes away priorities in life, resulting in individuals seeking remedy for this disease. This infectious disease affects people differently, causing fatality in some, mild to severe symptoms in others, while the rest remain asymptomatic. The reason people respond to COVID-19 differently because of certain underlying health conditions, dietary intake, environmental controls, genetic predisposition, immune system function, or other factors, as revealed in time [7] [3].

The proposed system will attempt to engage and assist participants in developing a gradual self-constructing system that will incorporate learning plans and processes to raise awareness about the pandemic. The course aims to comprehend, combat, coexist, cope, and trace COVID-19. An algorithm will formulate to tackle a solution to COVID-19.

Awareness Systems

The provided framework consists of the necessary initial set up for both the information and the pandemic code. The core of the system is in its simplicity so that the participant can personalize that.

The system is dynamic and fluctuates frequently depending on newly found facts while eliminating the unnecessary and overwhelming prior information. The participants' request is to be open in sharing the findings using the honor system through generating values. The participant's task is to customize the given working space and the environment by gathering continuous information and modifications in four embedded systems known as diagnostics, simulation, contact tracing, and pattern-matching.

Diagnostics System

The foundation of the diagnostic system is to use inference rules by providing several COVID-19 symptoms that lead to COVID-19 and similar symptoms that relate to other diseases [1][5].

The given simple search program explained to the participants the necessary steps to examine and run the COVID's co-symptoms and the related diseases. A participant can change the factor for each symptom and value of the counter to conclude the COVID-19. Participants can increment the array when new symptoms are found [4].

The foundation of the diagnostic system is to use inference rules by providing several COVID-19 symptoms that lead to COVID-19 and similar symptoms that relate to other diseases.

Simulation System

The way Covid-19 enters the body, and the aftermath is the task of the simulation system [2]. The skeleton for the simulator system is to work as a game, depicting the way the virus (SARS-CoV-2) enters and interacts with the body's cells. There are four scenarios involved in defeating the body's cell, defeating the virus, neutral coexistence of the virus and cell, and at best, turning into a positive virus. At that stage of defeating the body's cell, the virus will replicate itself by an assigned degree with a recursive behavior. There are cases where the virus becomes part of the body and stay neutral or becomes a useful virus, fighting the COVID-19.

Tracing System

The trace of the COVID-19 and the participant's health can be presented uniquely using red, green, and blue (RGB). The combination of Web color code generates 16,777,216 different colors that can be used for the participant and/or other situations of the COVID-19. Millions of colors create a protocol set by the participant consisting of 24 bits of colors. The color can be shown by their binary value or hexadecimal (000000 black to FFFFFF white) with grouping criteria. For example, red indicates COVID-19, with 16 shades of red for a symptom with a 16 degree of severity.

Pattern Matching System

Using a digitized system, a participant can create an I.D. and or collect the I.D.s that can analyze for a pattern [6]. This pattern-matching system's skeleton provides four databases incorporating asymptomatic, mild, severe, and fatal cases. An example would be to find a common factor among fatal cases or comparing asymptotic cases with severe ones—a sample of digitized data collected to establish patterns among the databases for trends. A series of patterns will shed light on the creation of an algorithm to solve the problem.

Conclusion

The system aims to comprehend, combat, coexist, cope, and trace COVID-19 with four diagnostics, simulation, tracing, and pattern matching systems. An output of one system can become an input to the next system and circulate. The learning from one system flows into another system resulting in a pattern. Based on the pattern, an algorithm will formulate to tackle a solution to COVID-19. This study's implication will be a guideline for others to initiate their own participant's system to find a pattern and formulate an algorithm for the pandemic.

REFERENCES

[1] Allam, M., Cai, S., Ganesh, S., Venkatesan, M., Doodhwala, S., Song, Z., Hu, T., Kumar, A., Heit, J. & Coskun, A.F. (2020). COVID-19 diagnostics, tools, and prevention. Diagnostics, 10,409. doi:10.3390/diagnostics10060409

[2] Barak, O., Gavish, N., Hari, L.P., & Shohat, T. (2020). Simulator of interventions for COVID-19.

[3] Centers for Disease Control and Prevention. (2020). https://www.cdc.gov

[4] Ebrahimi, A., (2002) C++ Programming EasyWays, American Press

[5] Harmon, S.A., Sanford, T.H., Xu, S. et al. Artificial intelligence for detecting COVID-19 pneumonia on chest C.T. using multinational datasets. Nat Commun 11, 4080 (2020). https://doi.org/10.1038/s41467-020-17971-2

[6] Wasiq, K., Hussain, A., Khan, S.A., Al-Jumailey, M., Nawaz, R., & Liatsis, P. (2020). Association learning between COVID-19 infections and global demographic Characteristics using class rule mining and pattern matching. https://arxiv.org/abs/2009.12923

[7] World Health Organization. (2020). https://www.who.int