US 20240214408A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2024/0214408 A1**

Crimmins et al. (43) **Pub. Date: Jun. 27, 2024**

(54) **ROBUST ELECTION LOGIC AND ACCURACY**

(71) Applicants: **REGENTS OF THE UNIVERSITY OF MICHIGAN**, Ann Arbor, MI (US); **THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS**, Urbana, IL (US)

(72) Inventors: **Braden L. Crimmins**, Ann Arbor, MI (US); **John Alexander Halderman**, Ann Arbor, MI (US); **Bradley Sturt**, Urbana, IL (US)

(21) Appl. No.: **18/394,391**

(22) Filed: **Dec. 22, 2023**

Related U.S. Application Data

(60) Provisional application No. 63/434,873, filed on Dec. 22, 2022.

Publication Classification

(51) **Int. Cl.**
H04L 9/40 (2006.01)
G07C 13/00 (2006.01)

(52) **U.S. Cl.**
CPC ***H04L 63/1433*** (2013.01); ***G07C 13/00*** (2013.01); *G06Q 2230/00* (2013.01)

(57) **ABSTRACT**

A transposition error may occur in a voting machine when the voting machine switches candidates so that votes are counted for a different candidates than a voter intended. Such transposition errors may occur due to either intentional manipulation (e.g., a bad actor hacking the voting system, etc.), or unintentional human error (e.g., an unintentional human error in computer programming, etc.). In some embodiments, a "minimum test deck" is created that includes the minimum number of filled out ballots that will effectively test a voting machine to ensure that no transposition error occurred.