THE USE OF AI IN FORENSIC DOCUMENT EXAMINATION

Artificial intelligence (AI) is sweeping the world as the new "it" thing. Proponents of AI suggest that this process is the key to rapid increases in efficiency and fostering innovation to include breakthroughs in research in multiple areas such as medicine, finance, transportation, manufacturing, and education. What about forensic document examination?

In order to determine the practical applications of AI to forensic document examination one must seek areas in which AI can have impact. AI is a tool that holds the potential of providing more efficient data and maps for data assessment. As a tool, there is certainly hope that AI could assist forensic document examiners. That time has not yet arrived as studies in AI applications as a tool are in their infancy but may well arrive in the near future.

But what about AI not just as a tool, but making the actual conclusion of authorship in place of a fully trained and qualified forensic document examiner? To answer this question we must, once again, turn to science. In this particular case, the science is validation studies. Forensic document examiners that are members of ASQDE must be able to document training that meets or exceeds the minimum training requirements published in industry standards. Forensic document examiners who meet these standards have been the subject of multiple proficiency studies by multiple, independent researchers for over 25 years. Let's look at what science would require in the form of proper validation studies should a suggestion be made that AI, in some form, can replace, or provide an alternative source of, the decision-making work of a forensic document examiner.

1. Parallel studies of proficiency of prepared comparisons for each AI programming, a large population of properly trained forensic document examiners, and a large control group of untrained persons with education levels comparable to the examiner group.
2. Multiple comparisons that provide a statistically valid quantity of test comparisons for each sub-category, those being as follows:
    a. High, moderate, and low penmanship skill
    b. Handprinted, cursive, and symbolic signature styles
    c. Handprinting
    d. Cursive
    e. Handedness
    f. Simplistic writing, complex writing, and varying degrees of intermediate complexity

g. Varied forms of authentic/ inauthentic writing to include genuine writing, genuine signatures, genuine initials, tracing, simulation, “simple forgery”
h. Inauthentic writing by experienced “forgers”, capable “forgers” and inexperienced “forgers”.
i. Writings in various alphabets and languages to include accent markings and any other idiosyncratic features.

It should be noted that each sub-category must be further sub-divided by other categories and sub-categories such that each and every combination of categories/sub-categories are not only represented but in adequate numbers to provide valid quantity.

Once this extensive research is completed, one must then assess the results and compare the results, particularly of AI to trained forensic document examiners, in each of the categories, sub-categories, and combination of categories/sub-categories for purposes of the determination of a statistically valid equal or lesser error rate of AI to the examiner group. Only then can one consider the use of AI in the decision-making role of a forensic document examination.

To do so before validation studies as described above is to ignore science and to risk the well-being of every individual that counts on the reliability of forensic science to assist in bringing the truth to court.