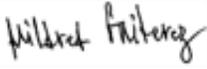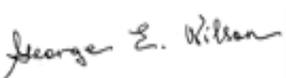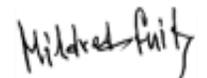# SignatureXpert
for Vote-by-Mail

The #1 Problem in Vote-by-Mail: Signature Matching

The most-common method employed to ensure each vote is legitimate is the use of signature match or review whereby each signature on a submitted ballot is compared with signatures on voter records to determine authenticity. In the majority of elections, which use vote-by-mail or absentee ballots, signatures are reviewed manually and this causes problems not only with high costs but also with the reliability of manual signature verification.

The Problem with Signatures

Studies show that younger voters were four times more likely to have their absentee ballots rejected than older voters. And a Propublica investigation revealed the signature verification procedures of states vary widely, bringing into question the validity of elections, wrongly disenfranchising a large portion of voters. According to the U.S. Election Assistance Commission, a "non-matching signature" was the number one reason for a rejected ballot. The physical act of signing a signature requires coordinating the brain, eyes, arms, fingers, muscles and nerves. With all of this in play, it's no wonder people don't sign their names exactly the same way each time - some elements may be omitted or altered. Personality, emotional state, health, age, conditions under which the individual signs, the space available for the signature and many other factors can influence signature-to-signature deviations.

Examples of inconsistent authentic signatures

SignatureXpert for Vote-By-Mail
A Modern Approach to ASV

SignatureXpert is Parascript's award-winning software which uses a number of machine learning techniques in order to provide the industry's highest level of accuracy when it comes to automating the complex process of signature verification for elections. It is trained on hundreds of thousands of both authentic and forged signatures in order to identify the key characteristics of each. As a result, it can identify that a signature is authentic even if there is significant variation between signatures on a ballot and those in a voter registration database.

Automatic verification is completed using a powerful combination of signature analysis algorithms called verifiers. These verifiers employ multiple methods and principles to confirm authenticity, including a human-like holistic approach to signature interpreting, feature extraction and comparison (using several neural network-based learning and interpretation agents), fuzzy logic and other advanced techniques. This process allows for the most comprehensive and intelligent analysis of signature characteristics while taking into consideration the random variations that occur in signatures.

SignatureXpert's verification elements include:

- *XR Elements that are Parascript's proprietary way to desconstruct any type of handwritten information*
- *Geometrical Analysis that looks at key shapes of the signature that do not typically change over time*
- *Analytical Analysis that breaks-out signatures into key segements.*
- *Neural Networks that intelligently combine the results of analysis to arrive at a single conclusion*

Conclusion

Automated Signature Verification is used today in many state's vote-by-mail processes to provide solid assurances each vote is treated fairly and thoroughly reviewed. States like Oregon, Colorado, Washington, and Utah provide solid examples of a new "gold standard" using ASV technology alongside other solid processes to ensure every election is efficient, legitimate, and secure. As states evaluate and implement vote-by-mail to support the upcoming election and elections in the future, automated signature verification should be a necessary component in their plans.