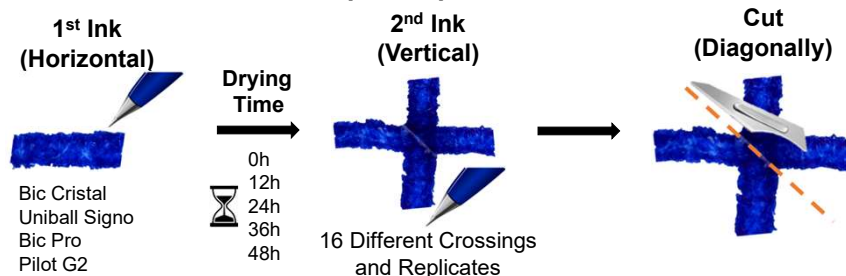


Introduction

- The Questioned Documents and Signature Forgery Field lacks:
 - A true understanding of ink distribution
 - An objective analysis of inks
- Raman spectroscopy analysis obtained chemical images of the inks and allowed for objective examination
- Multivariate Curve Resolution analysis was used to treat the data
- This study objectively observes the interior of blue ink crossings

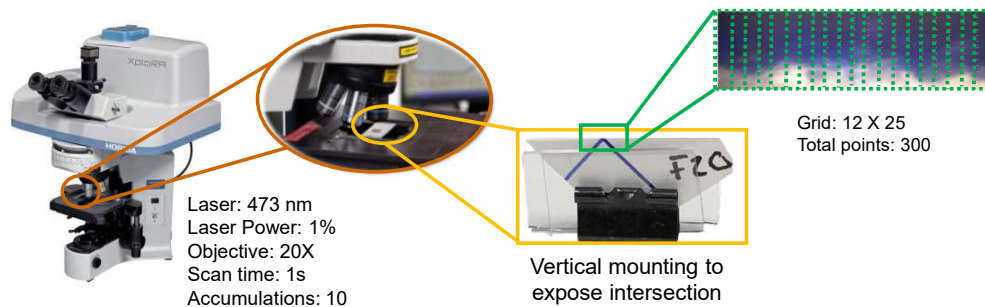
Methodology

Sample Preparation

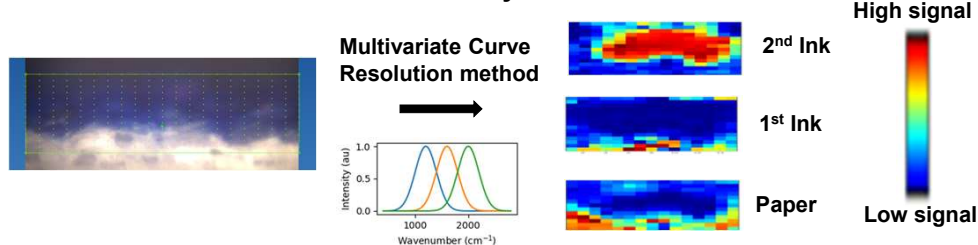


Raman Chemical Imaging

Horiba Xplora Raman Microscope



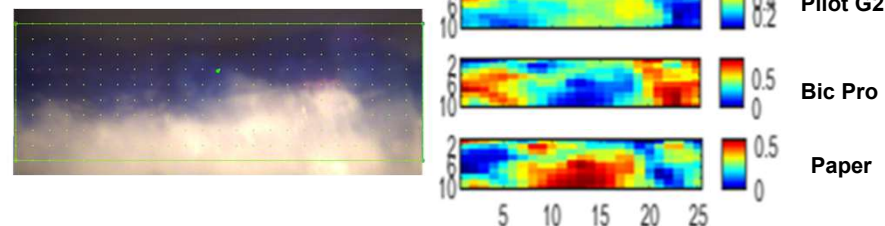
Data Analysis



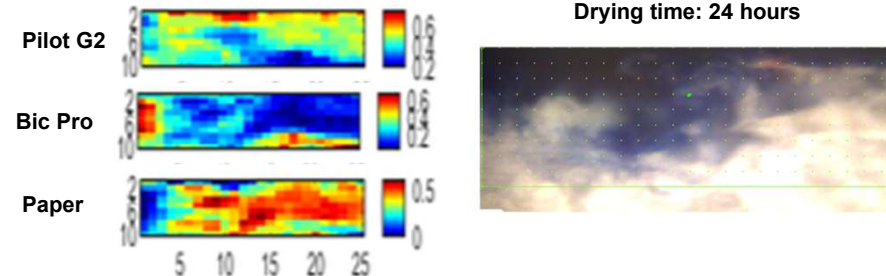
Preliminary Results

Pilot G2 Over Bic Pro

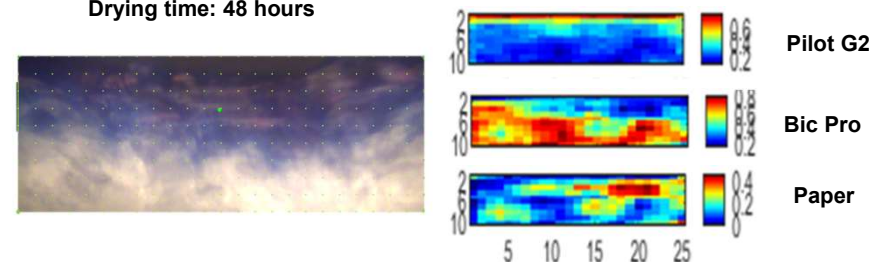
Drying time: 0 hours



Drying time: 24 hours



Drying time: 48 hours



Conclusions

Preliminary results showed successful imaging of the crossing and distribution of inks. This method shows potential for application in real forensic civil and criminal cases.

Acknowledgements

- A special thanks to:
 - The University of Pittsburgh and the Materials Characterization Lab for use of the Raman spectrometer
 - The Slippery Rock University office of Academic Affairs and Integrated Learning for awarding the SCORE grant