Research question: Can we extract data about an artist's artwork; strokes, medium and other details to recreate the artwork using a machine?

Introduction
A robot is an engineered machine that mimics human movements repeatedly with accuracy and precision. Machines have allowed us to automate many repetitive tasks, saving us time to do more intellectual and creative work. One factor that differentiates humans and robots is the creativity that we humans possess. One such beautiful outcome of human creativity is graphic art, which is art expressed on flat surfaces (sketch, drawing, painting). No mark is wrong, and every mark is different and has its own expressions.

Methodology
Digital Art was studied in its 2 basic formats - raster graphics and vector graphics. Scalable Vector Graphics (SVG) was chosen to initiate the study since it provided detailed data about a mark made. This data contained computer code which defined the mark in 2 dimensional geometry using line, circles, ellipse and other common geometrical shapes. This code was then converted to another format, G-code, which is used in computer numerical control (CNC) – to control the movements of the machine.

Conclusion
The initial study concluded with success in mimicking vector graphics. Accuracy of 0.25 mm was observed in the mechanical structure.

Future Work
The future work in this research would include studying raster graphics and vectorization formulae and algorithms to allow the machine to mimic digital paintings. Another study would also include live-tracking the whole mark making process to gather more precise data that would allow us to recreate the artwork.

References

Acknowledgements
I would like to thank Prof. Anthony Kuhn for his initiative and mentorship in this research. I would also like to thank Fulton undergraduate Research Initiative to provide me this platform.