A Novel Method to Detecting Lines on an Image with High Noise Density

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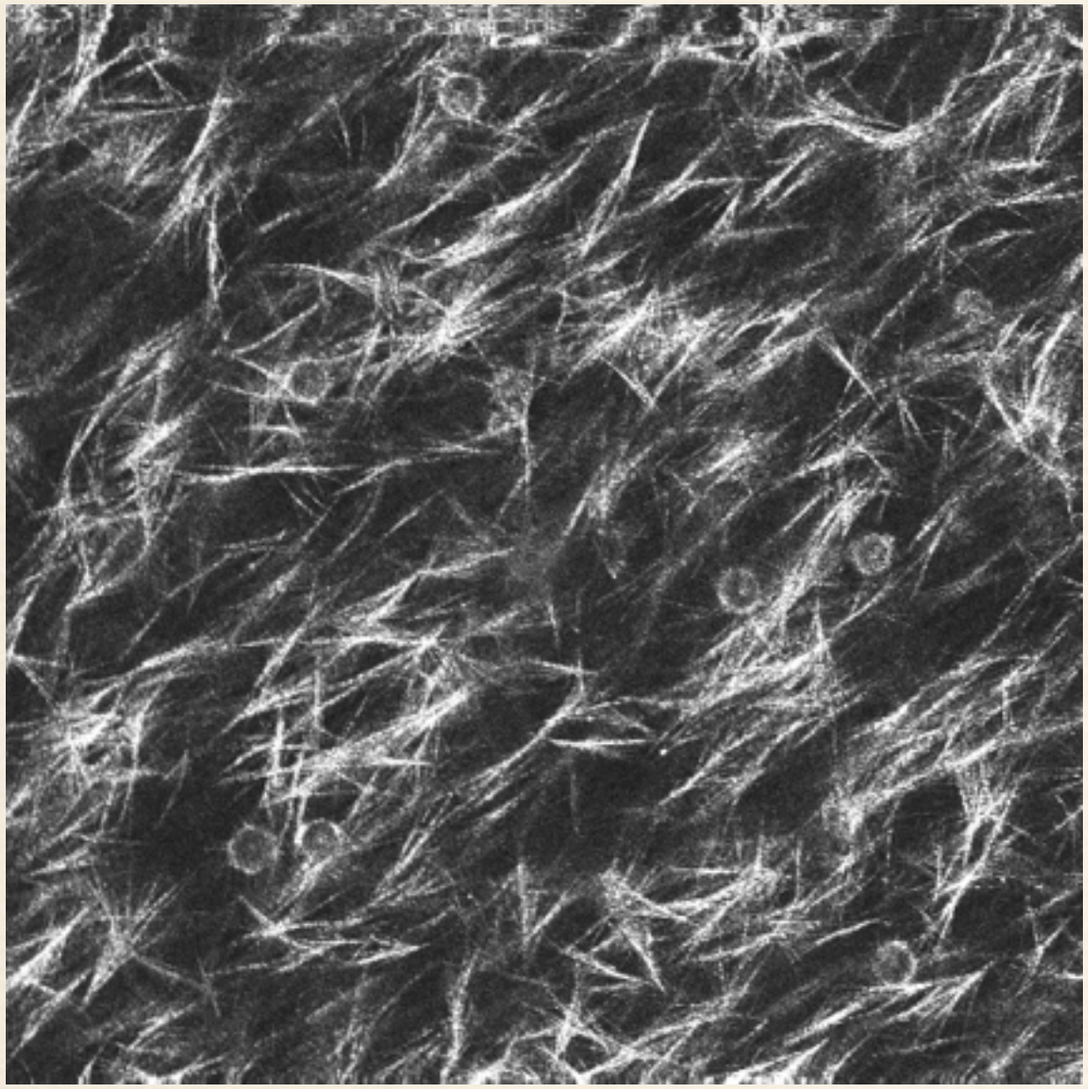
Outline

- Motivation
- Algorithm
- Results
- Concluding Remarks

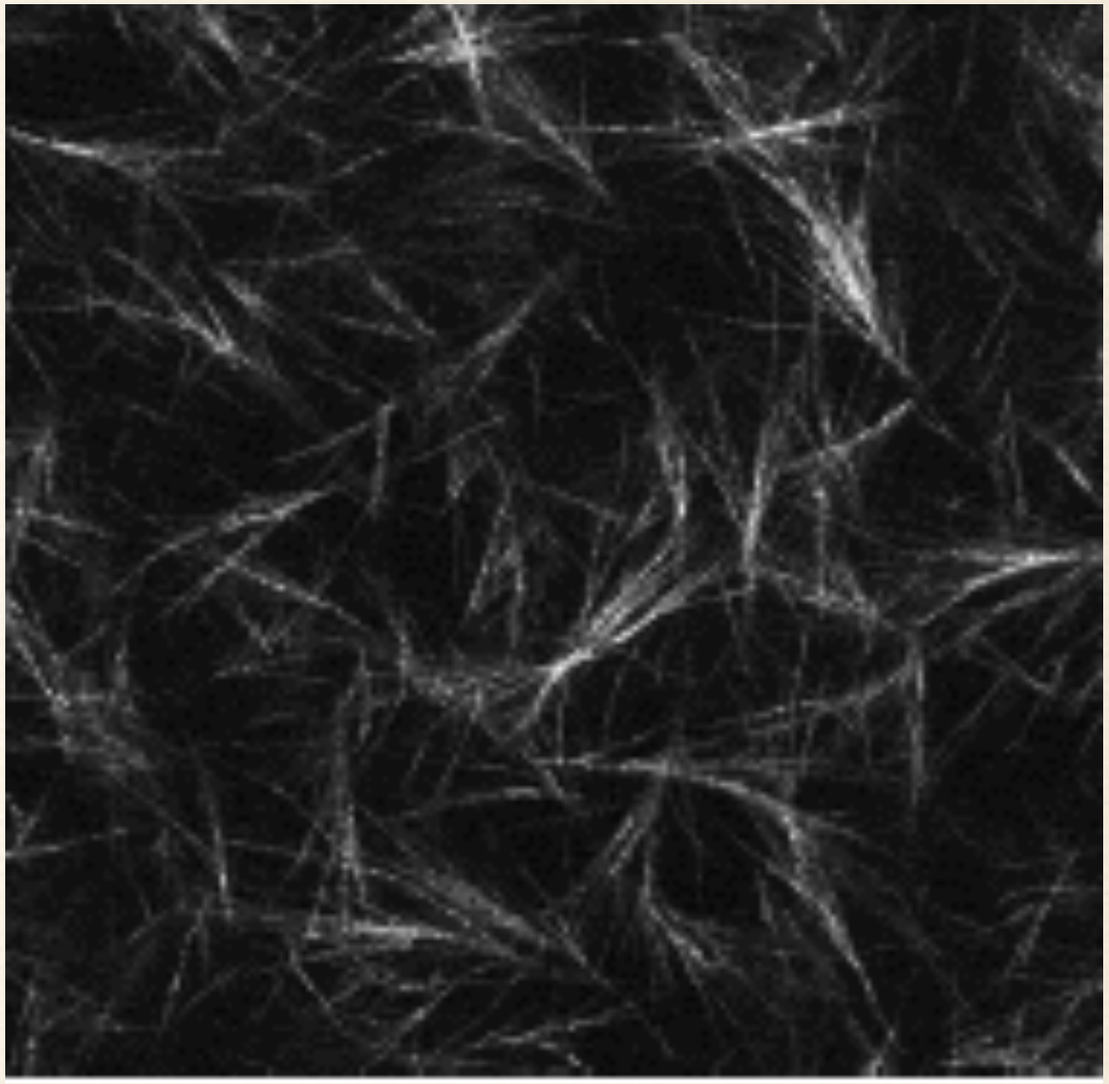
Motivation

- We use a confocal microscope to capture collagen fibers
- Then, we use image processing to identify the fibers on the captured image to study how they're oriented and their lengths
- Confocal images have noise, which can decrease fiber visibility
- Filters to remove noise can remove fibers from the image
- Our task is to find a way to identify the fibers without using noise filters

Samples Confocal Images

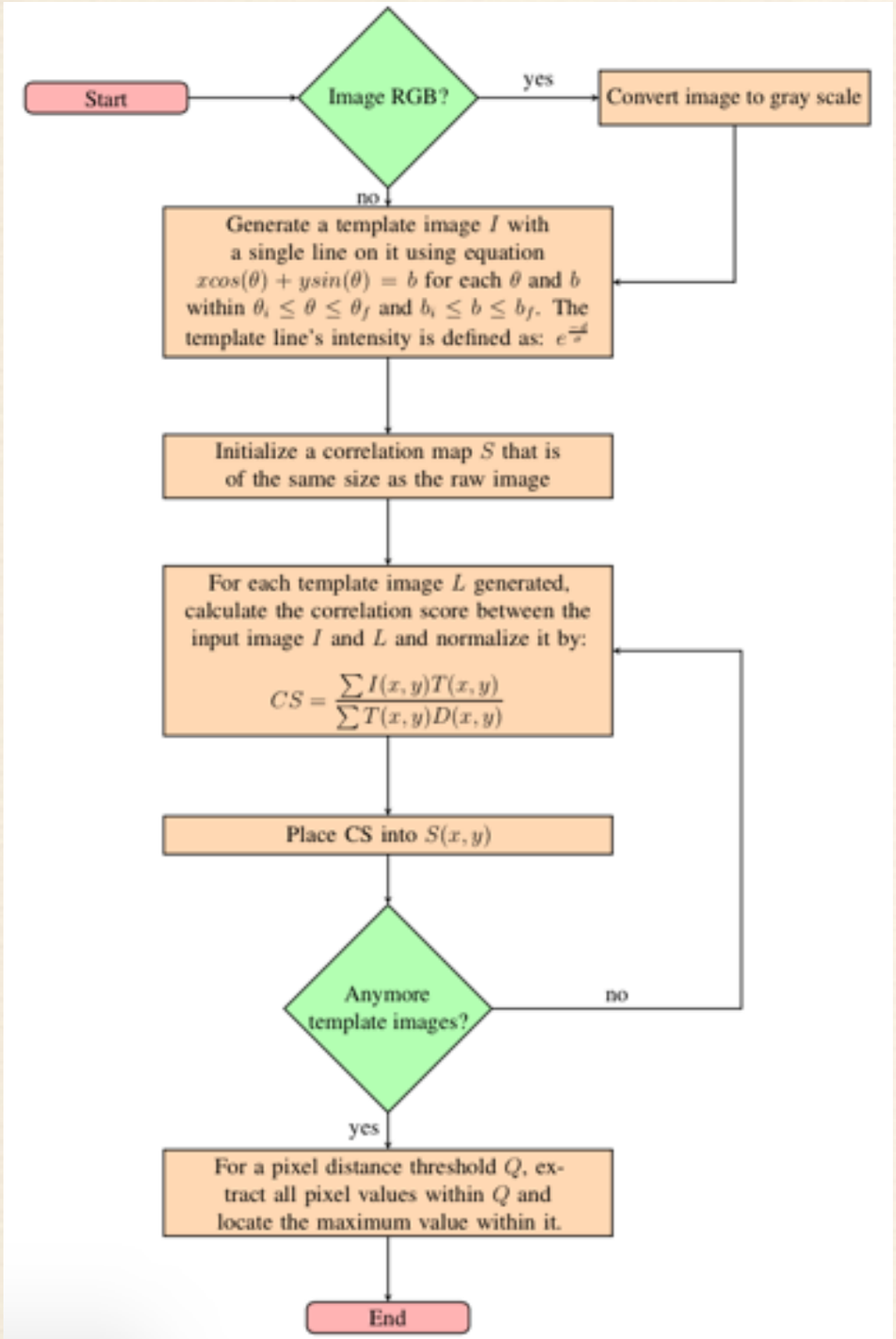


Collagen fiber with cancer cells

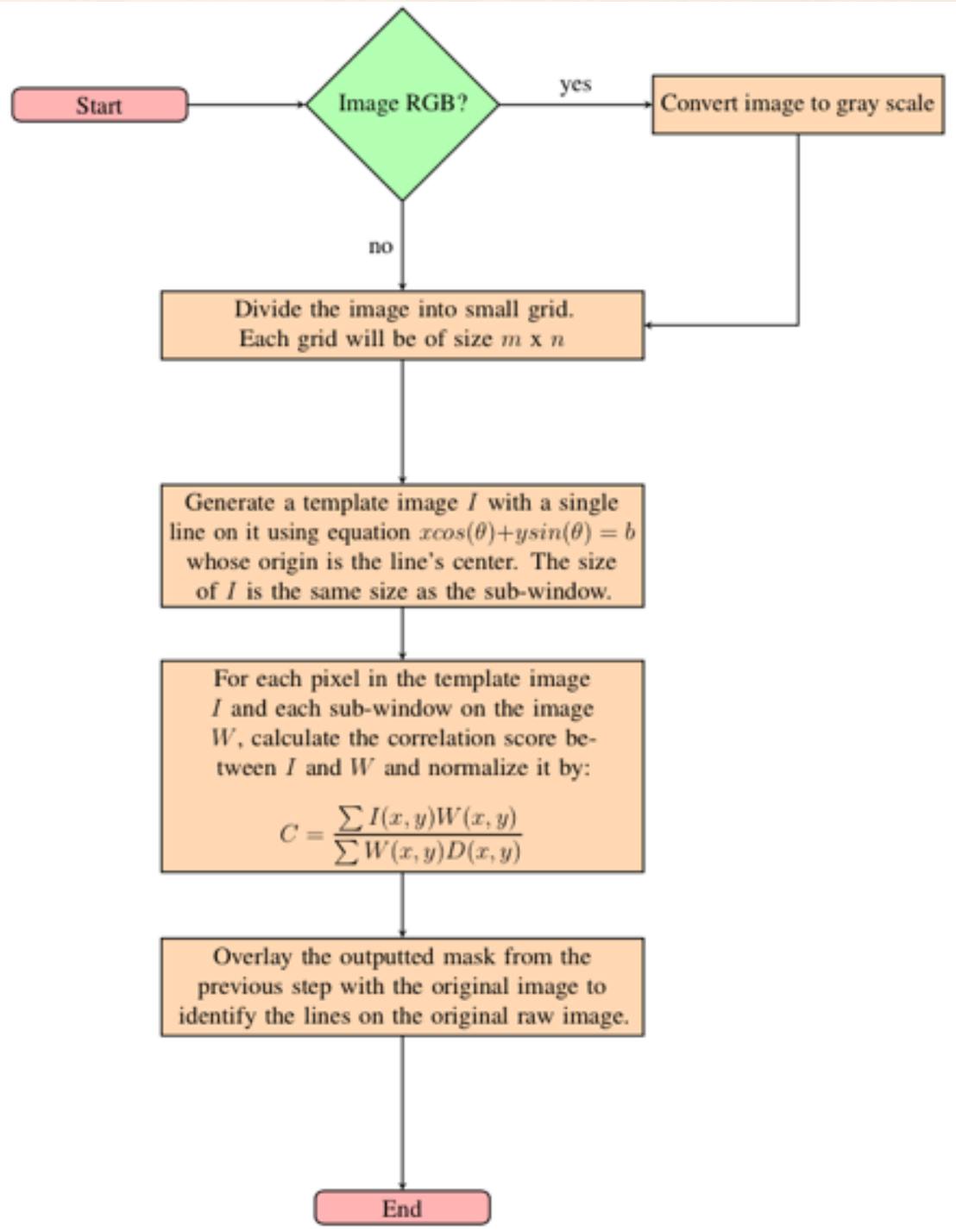


Collagen fiber image

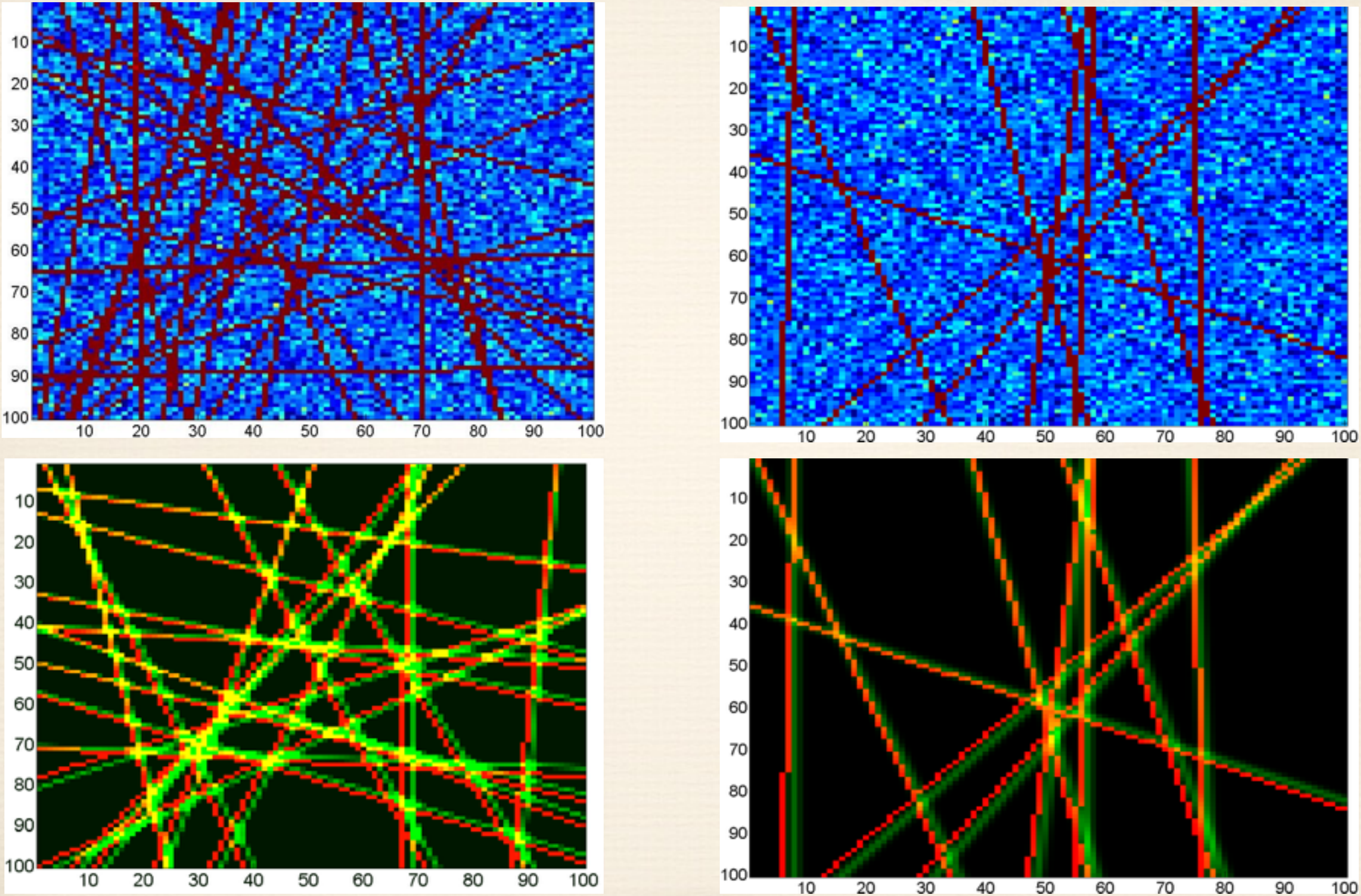
Correlation Analysis



Sub-window Analysis



Results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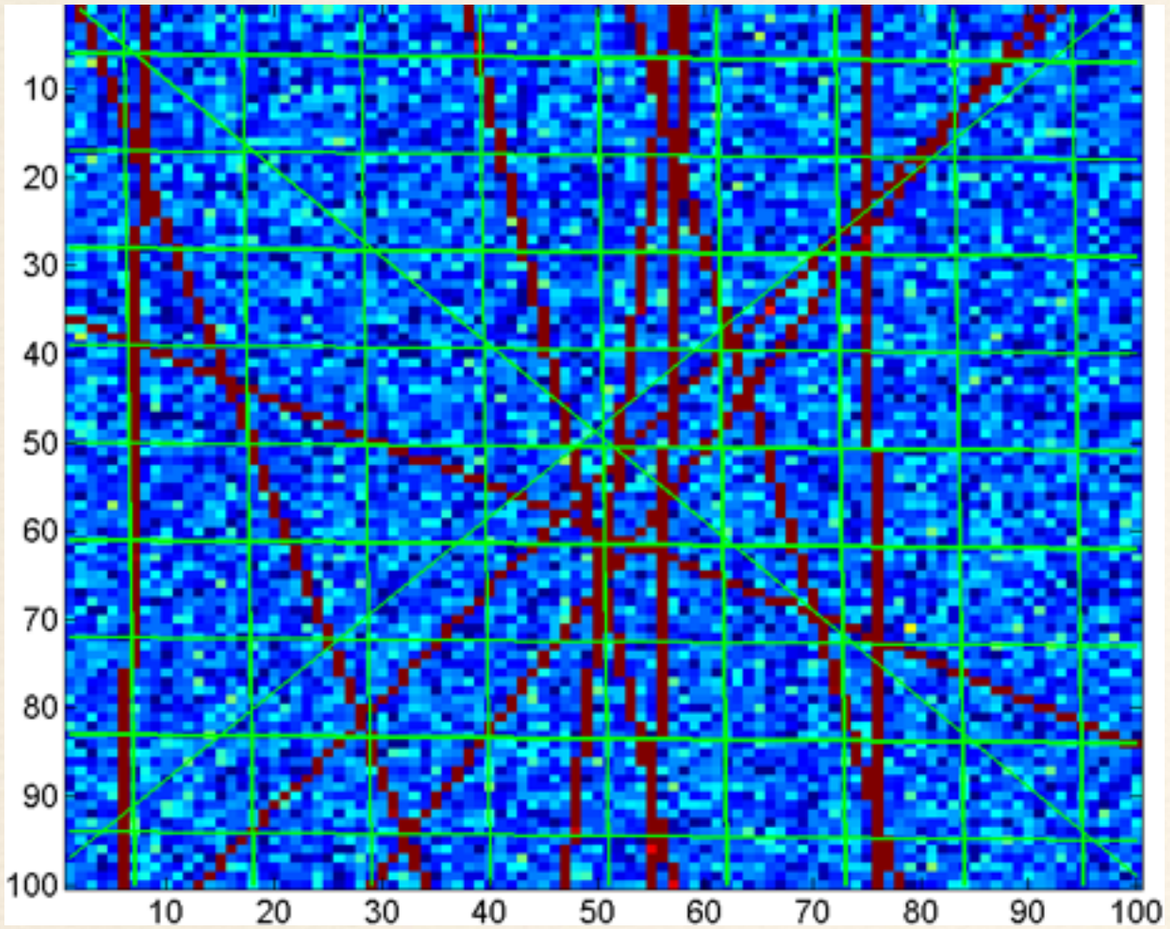
Result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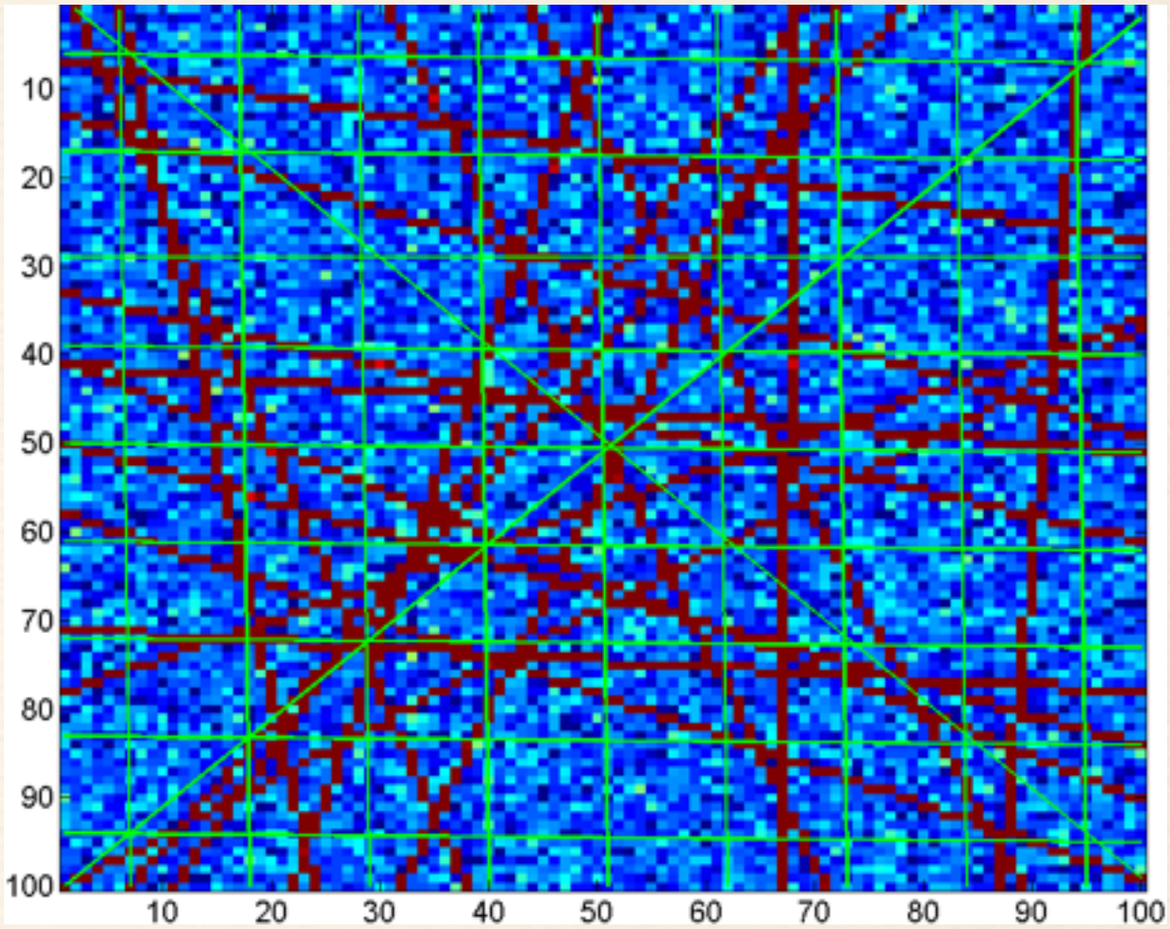
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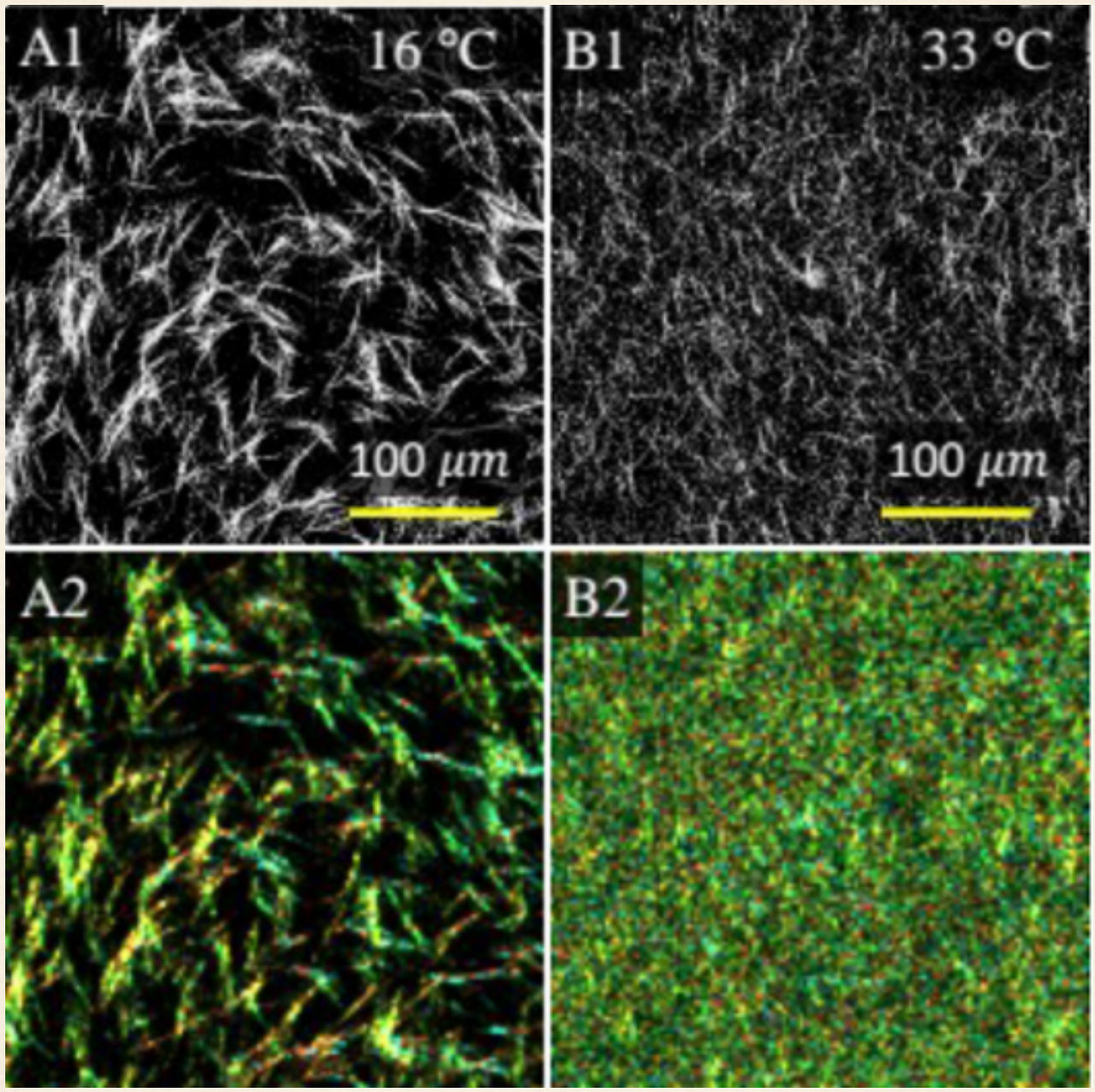
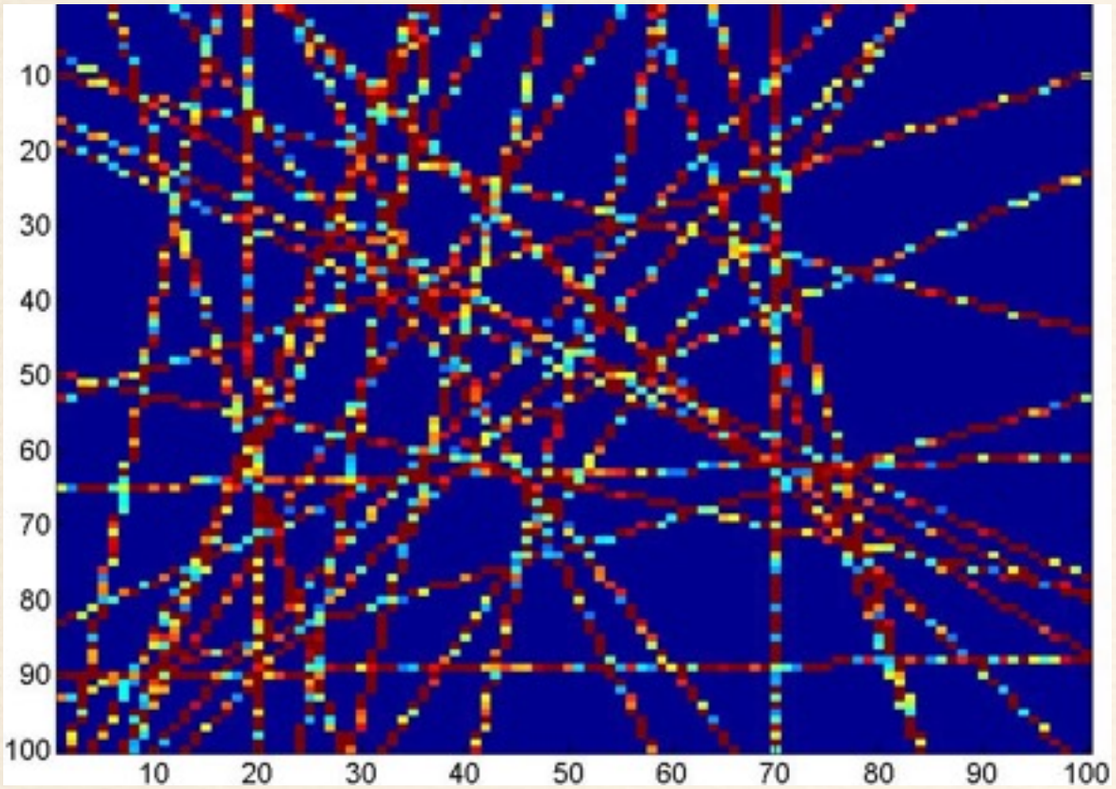
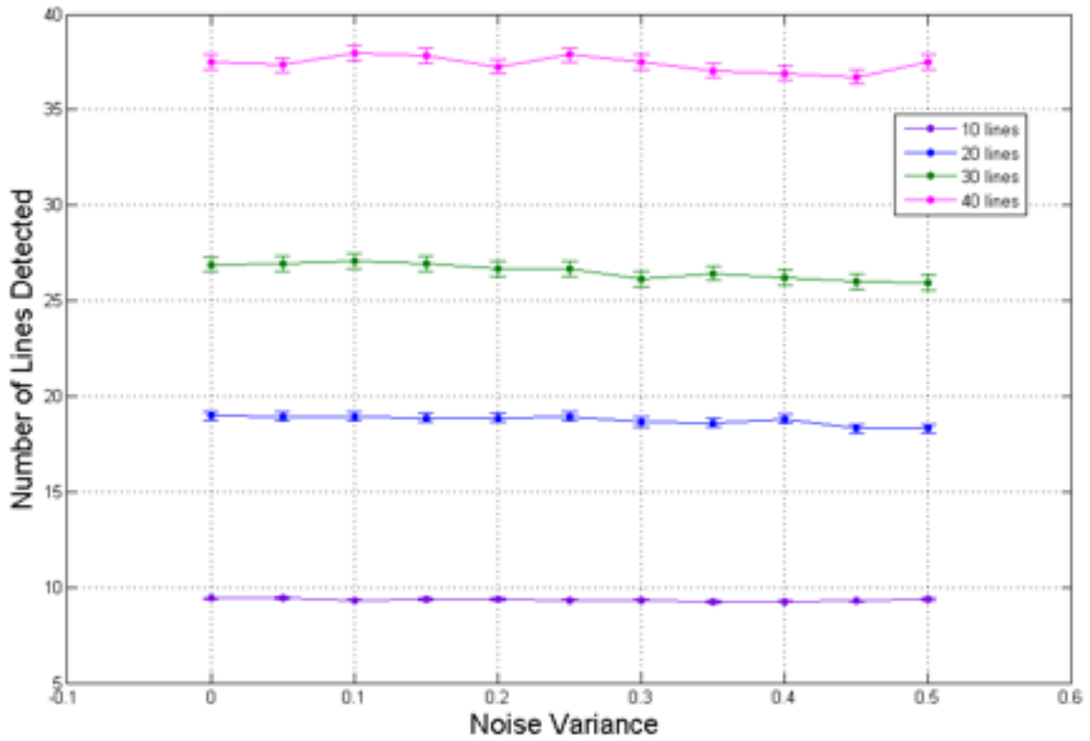
Result

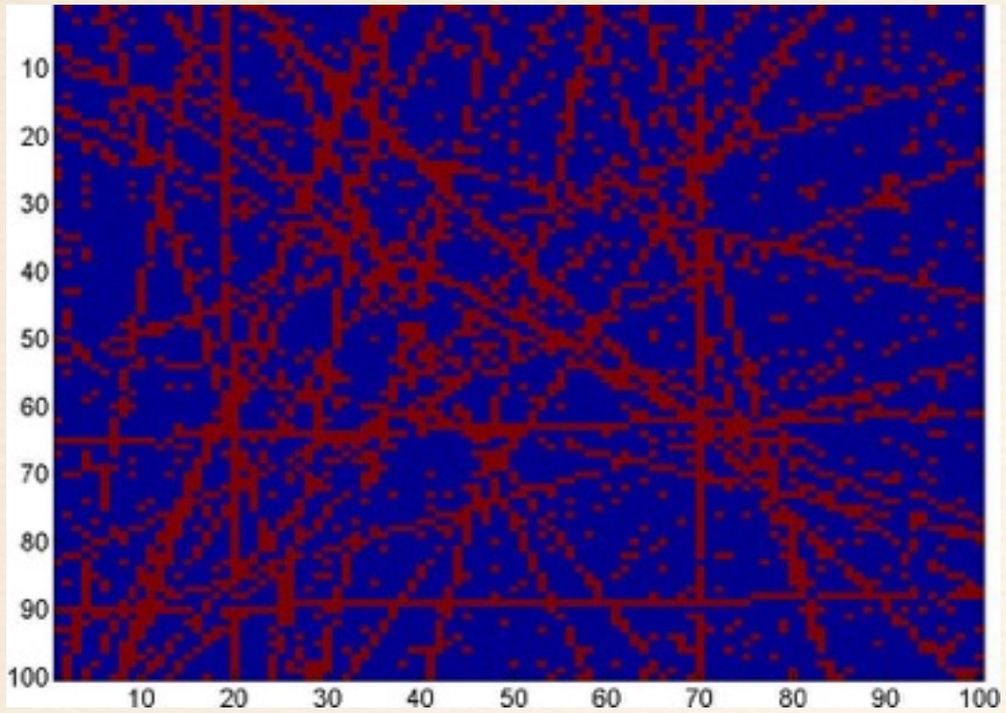


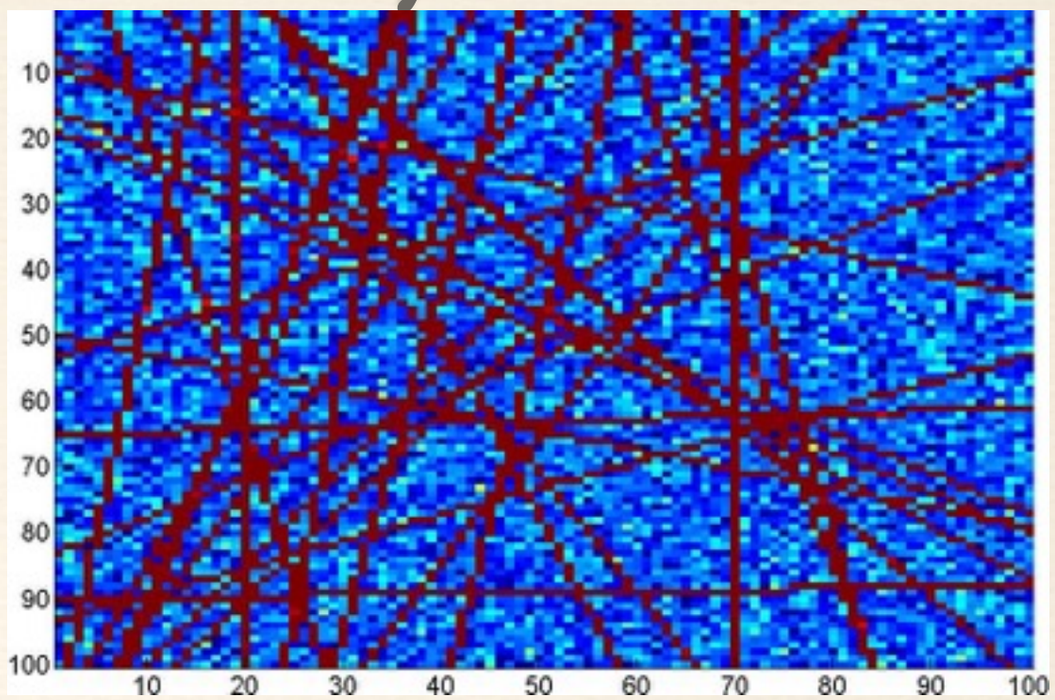
Statistical Analysis

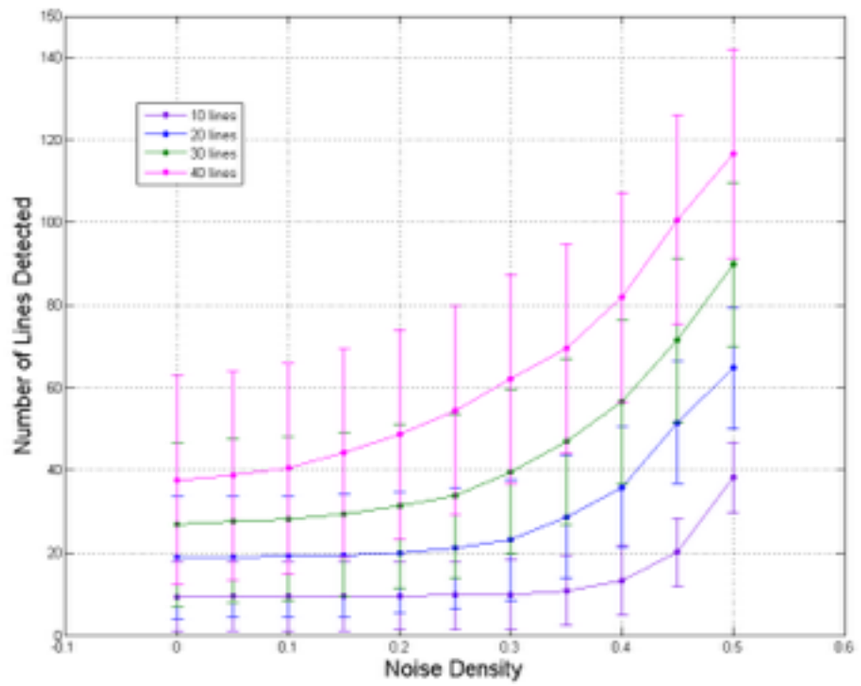


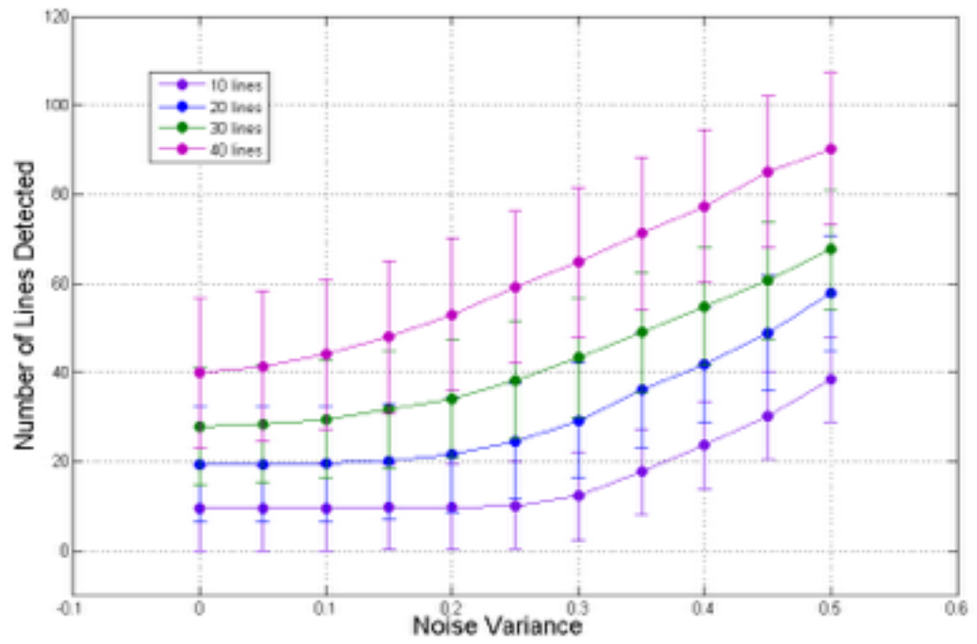


Statistical Analysis









Conclusion

- We were able to detect lines on collagen images using our novel method
- Future work: extend our method to include 3-D lines
- Future work: Convert our algorithm from MATLAB to Python or C/C++