1. Where do you see image analysis fitting into your future project? Are there specific techniques and/or types of data you hope to collect from your images?

*My current research project involves exploring the genetic architecture and mechanisms underpinning US sorghum adaptation and identifying compatibilities that improve trait discovery and crop improvement for several traits across private breeding programmes. Image analysis might not fit into my current research. Still, in the future, image analysis may be important for quantifying the role of genes underlying stomata conductance as a drought trait.*

1. What was the most challenging part of working through the example in CellProfiler? Why was it challenging?

*Picking the ideal analytic module for measuring the cross-section of the stomata and automating it for different images.*

1. Find an image from a recent paper you read. What type of data did they collect from the image and what technique/software did they use to analyze it? Include references.

*To investigate the contribution of guard cell vacuoles to stomatal movement, Tanaka et.al, (2007) examined the dynamics of vacuolar membrane structures in guard cells by quantifying the vacuolar volumes and surface area using REANT (reconstructor and analyzer of 3-D structure) during stomatal movement.*

1. Describe an image analysis platform we haven’t discussed in class. What types of images can be analyzed and what types of analysis are possible? Include references.

*BioImageXD is an open-source software package for the analysis, processing, and visualisation of multi-dimensional microscopy data, particularly in the field of biology and bioimaging. It provides various tools for tasks such as image segmentation, 3D rendering, co-localization analysis, and tracking.*

**Reference**

Kankaanpää, P., Paavolainen, L., Tiitta, S. *et al.* BioImageXD: an open, general-purpose and high-throughput image-processing platform. *Nat Methods* **9**, 683–689 (2012). <https://doi.org/10.1038/nmeth.2047>

Tanaka, Y., Kutsuna, N., Kanazawa, Y., Kondo, N., Hasezawa, S., & Sano, T. (2007). Intra-vacuolar reserves of membranes during stomatal closure: the possible role of guard cell vacuoles estimated by 3-D reconstruction. *Plant & cell physiology*, *48*(8), 1159–1169. <https://doi.org/10.1093/pcp/pcm085>