Introduction to Image Analysis Software (IAS) Sept 2021, 5 days, 11 students J. Adler

Feedback scores are shown in brackets, scale 1 (bad), 3(OK) to 5(very good)

The course was held in person – previously we ran an ImageJ course over ZOOM – not a success. Zoom greatly reduced the interaction; can't see who has problems, exactly what the problem is – let alone provide a solution or discuss areas of difficulty. It is also hard to notice when students are losing interest and need a break. Frequent breaks are also useful because, time can be spent with students who need more help and with those who have deeper questions

In the opening session each student gave a short presentation – their research project, their images and their need for image analysis. Useful for me and introduces the students to each other, the course works best when the students interact. This worked well (4.75).

The course is intentionally interactive, together we run through a worksheets using selected images, that require the students to use the software and then answer questions about their results.
There are three primary aims in using ImageJ

i) Appreciating what image analysis software can do
ii) How become proficient in specific software, menus, terminology etc.
iii) Discover problems/limitations of image analysis

The feedback for this part was also excellent (material & presentation(5) and interaction (5)).

A next stage builds on their understanding of image analysis, to begin writing code (macros) to automate image analysis. Again this is done interactively with a worksheet. This is more difficult because most have little or no programming experience, which requires new concepts, precision and how to find/correct errors. The feedback for the material (5) and presentation (5) was excellent.

The last part of the course splits (based on similar interests) the students into pairs and each pair works on an image analysis problem relevant to their research (they choose). Before they start each group shows their images and presents their plan to the class for discussion. My role is then to move between the groups checking on their progress, helping, suggesting etc. They work in pairs because deciding on how and address an image analysis problem is difficult and starting to write code is hard. In a group there is always someone to interact with – an observation is that it is hard to spot your own coding mistakes but much easier to spot someone else's – so at this stage in their development working in a group is efficient. Groups of 2 are best, in larger groups one member becomes passive. There was a range of ability across the five groups, strongest was very impressive, needing little support from me, while the weakest required frequent support, but everyone worked – students can't sit this out. That creating software is hard is perhaps reflected in the feedback score (4).

The final test is that each group demonstrates/presents their work to the class and answers questions– student's performance is used to assess if each student has met the required standard.

Cell Profiler(4), Huygens(4.25) and Qupath(4.25), enough to make the students familiar with them.

The biggest failure was the poor feedback from the KURT assessment form, 4 students from 11. This was my fault, the form had too narrow a time window. This will be corrected.

One change in this course was that it ran across a weekend, giving a 2 day break– this was appreciated by the students – the course is intensive.

An interesting idea is to send a second feedback form a year later, after the students have used image analysis. To find what really proved useful, what could be improved etc