

DataLucence::Images

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Increasingly, research in the biosciences involves data in digital formats and scientists spend a significant fraction of their time building and using software to harvest insight from digital data. A central goal of this course is to expose students to concepts adopted from computer science and data science regarding data management, data curation, and analytical workflows for analyzing digital data. We will focus on digital images since this image type is used in diverse sub-fields in the biosciences.

Course schedule

November 21, 22 Software Carpentry Workshop (unix shell, version control, python).

The workshop starts at 9:30a on both days and lunch; morning coffee/refreshments will be provided.

December 2, 4, 6, 9 DataLucence::Images

Hands-on workshops covering the following topics: 1) Understanding and manipulating digital images; 2) Debugging errors in code; 3) Preprocessing (thresholds and filters); 4) Morphological Operations; 5) Region Properties; 6) Image Quantification; 7) Batch Processing and Tracking

December 11, 13 Open studio

Bring your own data and work in parallel with classmates and instruction team to develop a workflow for analyzing your data. We will be joined by the directors of microscopy cores, among other experts.

SoftwareCarpentry

Hands-on, two-day event that covers the core skills needed to productively use software to support research activities in a small research team. Short tutorials alternate with practical exercises, and all instruction is done via live coding. The workshop follows a standard format and open source policies enable their use, revision and supplementation by a global user community (<https://carpentries.org/>). Our will be held on November 21 and 22 and expose learners to the Unix shell, programming logic (in Python), and version control (using git and github). No prior programming experience is required, but you may opt out of the two-day workshop only if you can demonstrate proficiency in python.

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Short tutorials alternate with practical exercises and emphasize automated analysis of image sets. The last two class sessions will be 'open studios' providing students with the opportunity to practice and apply tools and analyses introduced during the course by analyzing either their own data, or data sets supplied by the instructors.


Tutorials specific to image processing

- 1) Understanding and manipulating digital images
- 2) Debugging errors in code

- 3) Preprocessing (thresholds and filters)
- 4) Morphological Operations
- 5) Region Properties
- 6) Image Quantification
- 7) Batch Processing and Tracking

Course Summary:

Date	Details	
Thu Nov 21, 2019	 Software Carpentry Workshop (https://canvas.stanford.edu/calendar?event_id=119831&include_contexts=course_107850)	9:30am to 12pm
	 Software Carpentry Workshop (https://canvas.stanford.edu/calendar?event_id=119832&include_contexts=course_107850)	1pm to 5:30pm
Fri Nov 22, 2019	 Software Carpentry Workshop (https://canvas.stanford.edu/calendar?event_id=119833&include_contexts=course_107850)	9:30am to 12pm
	 Software Carpentry Workshop (https://canvas.stanford.edu/calendar?event_id=119834&include_contexts=course_107850)	1pm to 5:30pm
Mon Dec 2, 2019	 DataLucence::Images Course Workshop (https://canvas.stanford.edu/calendar?event_id=119824&include_contexts=course_107850)	9:30am to 11:20am
Wed Dec 4, 2019	 DataLucence::Images (https://canvas.stanford.edu/calendar?event_id=121354&include_contexts=course_107850)	9:30am to 11:30am
	 DataLucence::Images Course Workshop (https://canvas.stanford.edu/calendar?event_id=119825&include_contexts=course_107850)	9:30am to 11:20am
Fri Dec 6, 2019	 DataLucence::Images Course Workshop (https://canvas.stanford.edu/calendar?event_id=119826&include_contexts=course_107850)	9:30am to 11:20am
Mon Dec 9, 2019	 DataLucence::Images Course Workshop (https://canvas.stanford.edu/calendar?event_id=119827&include_contexts=course_107850)	9:30am to 11:20am
Wed Dec 11, 2019	 DataLucence::Images Course Workshop (https://canvas.stanford.edu/calendar?event_id=119828&include_contexts=course_107850)	9:30am to 11:20am

Date	Details	
Fri Dec 13, 2019	 DataLucence::Images Course Workshop (https://canvas.stanford.edu/calendar? event_id=119829&include_contexts=course_107850)	9:30am to 11:20am