Session 2

The second session of the LSSTC DSFP program focuses on machine learning, with a secondary focus on visualization and alternative methods of model fitting.

Schedule

Links to instructor GitHub repos are denoted by :octocat:; links to lectures on YouTube are denoted with :movie_camera:

Day 1 — (Re-)Introduction to Machine Learning

Monday, Jan 23, 2017

- 08:00 AM - 09:00 AM o Registration
- 09:00 AM - 09:30 AM o Introduction to new instructors
- 09:30 AM - 10:30 AM o Review of ML from Session 1; A. Miller :octocat::movie_camera:
- 10:30 AM - 11:00 AM o Break (coffee?)
- 11:00 AM - 12:00 PM o Problem -- Supervised Machine Learning; A. Miller :octocat: — Solutions
- 12:00 PM - 01:30 PM o LUNCH
- 01:30 PM - 02:30 PM o Unsupervised Machine Learning; M. Graham :octocat::movie_camera:
- 02:30 PM - 03:00 PM o Break
- 03:00 PM - 04:30 PM o Problem -- Clustering; M. Graham :octocat:
- 04:30 PM - 06:00 PM o Visualization for Communication #1; D. Huppenkothen :octocat: :movie_camera:

Day 2 — Connecting Machine Learning and Alternative Model-Fitting Methods

Tuesday, Jan 24, 2017

- 09:00 AM - 10:30 AM o Introduction to machine learning in astronomy; D. Kirkby :octocat::movie_camera:
- 10:30 AM - 11:00 AM o Break
- 11:00 AM - 12:00 PM o Visualization for Communication #2; D. Huppenkothen :octocat: & L. Walkowicz :octocat:

- 12:00 PM - 01:30 PM o LUNCH
- 01:30 PM - 04:00 PM o How to interpret (or not) machine-learning models; D. Huppenkothen :octocat::movie_camera: — Problems; Solutions
- 04:00 PM - 04:30 PM o Break
- 04:30 PM - 06:00 PM o The Expectation-Maximization Method; D. Kirkby :octocat::movie_camera:

Day 3 — Deep Dive on MCMC

Wednesday, Jan 25, 2017

- 09:00 AM - 10:00 AM o The Markov Chain Monte Carlo Method; D. Kirkby :octocat::movie_camera:
- 10:00 AM - 10:30 AM o Break
- 10:30 AM - 12:00 PM o Problem -- MCMC; D. Kirkby :octocat:
- 12:00 PM - 12:30 PM o Visualization for Communication #3; D. Huppenkothen :octocat: & L. Walkowicz :octocat:
- 12:30 PM - ??:?? PM o Break

Day 4 — Introduction to Deep Learning

Thursday, Jan 26, 2017

- 09:00 AM - 10:00 AM o Introduction to Neural Networks; B. Naul :octocat::movie_camera:
- 10:00 AM - 10:30 AM o Break
- 10:30 AM - 12:00 PM o Problem -- basic neural nets; B. Naul :octocat: — Solutions
- 12:00 PM - 01:30 PM o LUNCH
- 01:30 PM - 02:30 PM o Advanced Neural Networks; B. Naul :octocat::movie_camera:
- 02:30 PM - 04:00 PM o Problem -- coding a neural net; B. Naul :octocat: — Solutions
- 04:00 PM - 04:30 PM o Break
- 04:30 PM - 06:00 PM o Introduction to Deep Learning; A. Mahabal :octocat:
- 06:00 PM - 09:00 PM o [OPTIONAL] Hack social

Day 5 — The Full ML Workflow; Final Visualization Presentations

Friday, Jan 27, 2017

- 09:00 AM - 10:00 AM o Developing the machine-learning workflow; A. Miller :octocat::movie_camera:
- 10:00 AM - 10:30 AM o Break

- 10:30 AM - 12:00 PM o Problem -- an end-to-end ML model; A. Miller — Solutions
- 12:00 PM - 01:30 PM o LUNCH
- 01:30 PM - 03:30 PM o Visualizing astronomical images; D. Shupe :octocat::movie_camera: — Solutions
- 03:30 PM - 04:00 PM o Break
- 04:00 PM - 05:30 PM o Final visualization presentations
- 05:30 PM - 06:00 PM o Meeting wrap up; evaluation of what was learned