Kursnamn: Advanced Scientific Programming with Python

Omfattning (högskolepoäng) 2
ECTS credits

Tidsperiod: Spring 2017
Course period

Antal platser: 20
Maximum number of participants

Undervisningsspråk: English
Language of instruction

Kursens syfte samt motivering till varför den bör vara fakultetsgemensam (max 150 ord)
Aim of course and motivation as to why it should be considered “multidisciplinary” to the extent that the faculty should allocate extra financing.

Modern research involves a lot of programming and many doctoral students across all disciplines regularly use common programming tools such as Python, Matlab or R when analyzing data, simulating problems or preparing for experiments. Many students have little knowledge about modern tools and techniques and so do not make efficient use of their coding time. The aim of this course is to teach best practices in scientific programming such that students become more effective programmers and eventually spend less time coding and more time doing research. Furthermore, with the concepts introduced in this course, students will be given the tools to produce well documented and tested code making their work clearer, more reproducible and useful to others.

Kursinnehåll, kursens uppläggnings samt examinationsform (max 150 ord)

This course covers the best practices in scientific programming with Python. The decision to use Python is based on the fact that it is commonly used in research across many disciplines. Contents of this course are

- Introduction to the UNIX shell
- Using git repositories for organizing and sharing code
- Interactive Python programming (Jupyter notebooks)
- Test-driven software development
- Advanced Numpy/Scipy
- Data containers (HDF5, pandas, pytables)
- Performance (cython, C extensions, multiprocessing, MPI)

The course will be taught as a 1 week (40 hours) seminar with many hands-on examples. Students will work in pairs on a computer/laptop provided by the organizers. Examination is based on attendance (> 90%) and participation in a team coding project (10 Hours) based on presenting its outcome in a final session (4 hours).
This course is targeted towards post-graduate students from all disciplines who use programming in their research on a regular basis. Students should be familiar with programming but no previous knowledge of Python is required as we will provide all material necessary.

Huvudansvarig institution Laboratory of Molecular Biophysics
Department with main responsibility

Andra inblandade institutioner (specifiera hur).
Other departments involved (specify how).

Kontaktperson/er (namn, e-postadress)
Contact person (name, e-mail address)
Benedikt Daurer (benedikt.daurer@icm.uu.se) and
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Anmälan om kursdeltagande till
Application from course participants should be sent to
Benedikt Daurer (benedikt.daurer@icm.uu.se)

Senast 31-01-2017
Not later than