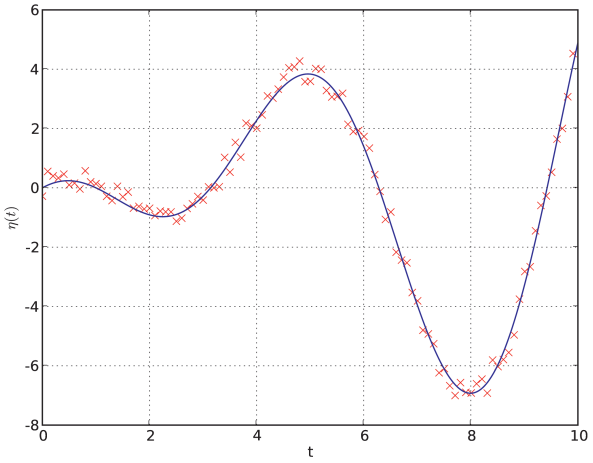
Programming for Scientists

Programming for Scientists is a student-taught course for scientists (biologists, physicists, chemists,...) who find themselves programming with not more than an introductory programming course or even just having informally learned how to write code.

The goal is to make students more effective programmers, who spend less time doing it, who write code that is more efficient, more readable, and has less bugs. A one semester course on the basics of good programming can increase programmer's productivity by 20%. Twenty per-cent is a full year of the typical PhD (numbers from Greg Wilson, U. of Toronto).

```
for iter in xrange(max_iters):
    h11=sigma
    h22=sigma
    h21=0.
    g1=0.
    g2=0.
    for i in xrange(N):
        fApB = F[i]*A+B
        if (fApB >= 0):
            p = exp(-fApB)/(1.+exp(-fApB))
            q = 1./(1.+exp(-fApB))
        else:
            p = 1./(1.+exp(fApB))
            q = exp(fApB)/(1.+exp(fApB))
        d2 = p * q
        h11 += F[i]*F[i]*d2
```



For the practical part of the course, the Python programming language will be covered. Python is a modern language which is increasingly used for scientific programming.

Students who want to learn programming from scratch are welcome and will be accommodated through two extra lectures at the start of the course.

Main Topics

Python Programming Language
Software Carpentry: the tools you need for small scale software projects
Numerical Programming: Optimisation and Floating-point issues

For more details, see syllabus on site.

SEMESTER: Spring 2009
CLASS INSTRUCTOR: Luís Pedro Coelho (3rd-year PhD. student in Computational Biology)
EMAIL: lpc@cmu.edu
CLASS FORMAT: 1 Lecture + 1 Lab Session per week (Tuesday & Thursday 6.30pm SH 220)
UNITS: 3 (Pass/Fail)
COURSE NUMBER: 98-111

WEBSITE: http://coupland.cbi.cmu.edu/pfs