Neural Networks & Biological Modelling

Python Intro

Felipe, Skander, Friedemann

Laboratory of Computational Neuroscience (Prof Gerstner)

21.02.2011
Your Friendly Assistants

Tim Vogels

Felipe Gerhard

Skander Mensi

Friedemann Zenke

http://lcn1.epfl.ch
We Are Here To Help!

- Course 9:15-13:00, INM 200
- Q&A in-lecture exercises
- 12:00-13:00 computer exercises
  - Laptop required
  - Software installation required
- Mini-projects
Why Computer Exercises?

- Interactive & visual
  - Understanding
  - Build intuition
- Prepare for mini-projects
- Build skills
  - Science need numerics
Wikipedia says …

Python is an interpreted, general-purpose high-level programming language[5] whose design philosophy emphasizes code readability.[6] Python aims to combine "remarkable power with very clear syntax",[7] and its standard library is large and comprehensive. Its use of indentation for block delimiters is unique among popular programming languages.
Why We Like Python

1. Simplicity
2. Power
3. Readability
Hello World

print "Hello World!"
I learned it last night! Everything is so simple!
Hello world is just print "Hello, world!"

I dunno...
Dynamic typing?
Whitespace?

Come join us! Programming is fun again!
It's a whole new world up here!
But how are you flying?

I just typed import antigravity

That's it?
... I also sampled everything in the medicine cabinet for comparison.

But I think this is the Python.
Integrate-and-fire Models

$$\tau \cdot \frac{d}{dt} u = -(u - u_{\text{rest}}) + RI(t)$$

LIF
If firing: \( u \rightarrow u_{\text{reset}} \)
Demo

LIF model

```python
ipython --pylab
import LIF
LIF.LIF_Step()
# try also
LIF.LIF_Step?
```