Neural Modeling and Computational Neuroscience

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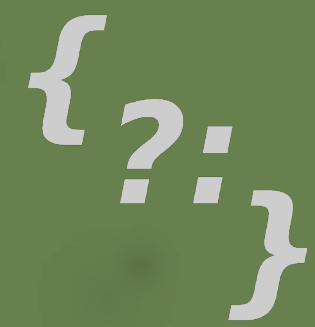


Something about the assignments

What is the purpose?

Written exam:

- Corpus of lab exercises – source code (at the date of exam)
- Labs material is individual
  - (you can work helping each other in class but the delivery should be original and unique for each student)

How to deliver the assignments?

- Email to us (Micheli, Gallicchio, Di Sarli) [micheli@di.unipi.it, gallicch@di.unipi.it, daniele.disarli@phd.unipi.it]
  - Subject: [CNS-2021] student <YOUR-SURNAME> exam material
  - Body (email text):
    - Name Surname, email contact
    - Master degree programme (Bionics eng. or Computer Science?)
    - File name for the material inserted on Moodle (and any note you find useful to us)
    - Please, DO NOT attach the exam material to the email

How to deliver the assignments?

- Upload the material (lab source code files, report for the project or slides for the presentation) in the Moodle platform (we will create a section Prj Student Material)
  - Note: all the material in only one delivery
  - Only deliveries announced also by email will be picked up and considered
  - Further details for the material (assignments) will be discussed during the course

Telematic Labs?

I have a general question!

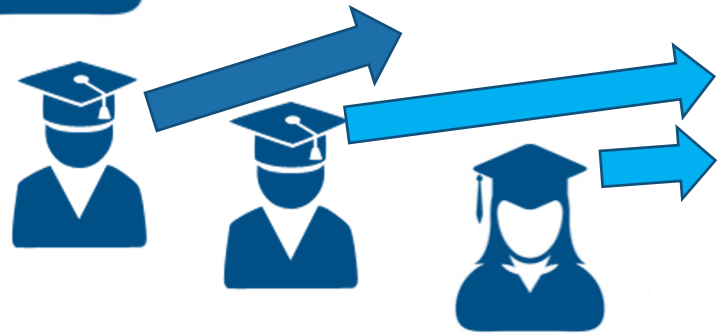
General Channel

- illustrate the assignments
- provide general-purpose clarifications

I have a specific question, or need assistance with one assignment!

Lab-Assistance Channel

1. kindly wait for your turn
   - (raise your hand)
2. interact with the instructor (sharing your screen)
3. return to the General Channel



Lab-Assistance Channel

Laboratory Assignment 1 (LAB1)

- Lab1-Assignments.pdf in the LABS section of the Moodle website
- Laboratory Assignment 1 (LAB1) Implementing Spiking Neurons using Izhikevich's Model

General Info

- Solve all the assignments and put all the required files into a zipped folder including one subfolder for each laboratory.
- The subfolder for this lab should be called “LAB1”
  - Matlab scripts & the other requested files
- Bonus track assignments?
  - those who finish early
  - not formally required for completing the Lab Assignment

Supporting Material

You will find a list of supporting materials.

For this assignment (Lab1)

- E.M. Izhikevich, "Simple model of spiking neurons." IEEE Transactions on neural networks 14.6 (2003): 1569-1572. Available online at: http://izhikevich.org/publications/spikes.pdf
- E.M. Izhikevich, "Which model to use for cortical spiking neurons?." IEEE transactions on neural networks 15.5 (2004): 1063-1070. Available online at: http://izhikevich.org/publications/whichmod.pdf
- Web page: http://izhikevich.org/publications/whichmod.htm

Supporting Material

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For this assignment (Lab1)

- MATLAB documentation - MATLAB User's Guide https://www.mathworks.com/help/index.html
- MATLAB onramp https://matlabacademy.mathworks.com/?s_tid=getstart_mlacad
- MATLAB documentation using the help command

In a Nutshell

Implement all the 20 neuro-computational features using the Izhikevich model

Additional Material

- The values of a, b, c and d parameters are reported in the LAB1-AdditionalMaterial.pdf document (section LABS in the Moodle platform).
- The values of the Izhikevich's model parameters and the shape of the input in all the cases are provided in:

http://izhikevich.org/publications/figure1.m

Do not copy/paste it! But use it!