

Welcome to the Neuroengineering Laboratory (UPRAMDYA) at EPFL!

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For your Semester Project, our goal is to give you some hands-on experience delving into the unknown, train you to think like a scientist/engineer (e.g., justify your approach, perform well-controlled experiments, work in a team, draw conclusions that are supported by the data, clearly present your work), see what a vibrant laboratory environment can be like, and – most importantly – help us understand how biological systems work and/or how we can use bioinspiration to build better artificial systems. You have a Primary supervisor in the laboratory (a Doctoral or Postdoctoral researcher) and are encouraged to seek out and discuss your project with her/him and Pavan during your stay. More information about the lab can be found on our [website](#).

Here is a logistical overview to guide you through the semester. It is **your responsibility** to complete each of these milestones and your final grade will depend on it. We are here to help you. Important dates are in **red**. Let Pavan know if you have conflicts with any dates.

**In the first week, after reading this document,
please sign it and return the physical copy to your Primary supervisor.**

Week 1 tasks – *week of February 18, 2019*

- Get access to the buildings. Fill and sign the access form provided (also on the server) and return it to the SV Magasin downstairs in the SV building.
 - DemandeAccess_CAMIPRO_EN_withFields
- Email Pavan your CV, and a 300 x 400 pixel photo for the lab website.
- With this email address, Pavan will give you access to the Ramdya-lab Slack channel: “student-projects”. You can learn more about how Slack works [online](#), from your Primary supervisor, or from another lab member. Send messages to your Primary supervisor and Pavan using Slack, not by email (unless forwarding info.).
- Arrange a 30-minute meeting with your Primary supervisor and Pavan to discuss the project goals & scope.

Week 2 task – *week of February 25, 2019*

- Prepare a [Gantt chart](#) for how you intend to go about achieving your project goals on a week-by-week basis. Please discuss this chart with your Primary supervisor over the course of the 2nd week. Email a finalized Gantt chart to your Primary supervisor and Pavan at the end of Week 2. It will be a reference for planning the remainder of the semester.

Finding State-of-the-art studies

- You can find scientific articles in various places. We recommend:
 - [Google Scholar](#) (all work)
 - [Pubmed](#) (peer-reviewed biology studies)
 - [arxiv](#) (preprints not in biology typically)
 - [bioRxiv](#) (preprints in biology)

Mid-term presentation – *Monday, April 1, 2019, 11:00AM-12:15PM, Room SV 2615*

- You and any other Semester project students will present for 10 minutes with 5 minutes for questions and answers afterwards. All of the lab will attend. You will not attend the other students' presentations unless this is explicitly agreed upon with your Primary supervisor and the other student(s).
- The goal of your presentation is to briefly summarize the work you have done so far and to discuss a precise plan for the remainder of the Semester.
- Specifically, you are asked to describe: (1) the overarching goal of the project, (2) the subaim you are addressing during the semester, (3) the Gannt chart of how you planned to tackle this subaim, (4) an update on your progress.
- Style notes: Have a consistent slide format. Black text on white background is typical. Embed all videos so the presentation can be stand-alone and work on any computer. A Keynote presentation is preferred over Powerpoint or a pdf but this is not required.
- Feel free to use the template slide provided: Presentation_TEMPLATE.key (or *.pptx)

Preliminary final report - May 31, 2019

~10 working days before the final Project report is due you should email your Primary supervisor a first draft of the report to get some feedback and to improve it. The report should include at least the following sections:

- **Front page:** Project title, date, supervisor, name, project type (Semester or Master project).
- **Table of contents**
- **Abstract:** In one paragraph indicate - what is the overarching goal, why it is important, what is the subaim you are tackling, what is the approach you took, which results suggest that your approach was successful or unsuccessful, what are perspectives for future work. Please include 1 or 2 representative figures.
- **Introduction:** Expand on the overarching goal, its importance, and the subaim you are tackling.
- **State-of-the-art:** How have others tried to solve this subaim before you?
- **Methods:** Which approaches did you take to solve this subaim?
- **Results:** Justify why you chose specific approaches to tackle the subaim. Summarize your findings with figures that have readable plots with labeled axes and scales, refer to all figures in the text, have numbered references to citable previous work. Do not necessarily present results in chronological order: present results in an order that makes sense for the project goals.
- **Discussion:** Which conclusions are supported by your results? How would you have done things differently if you could do the project again? How should future researchers follow up on your work?
- **References:** Provide citations to previous work. Use a consistent approach when citing other studies.
- **Original Gannt chart:** Include your original Gannt chart. Note where deadlines were not met and why they were not met. Indicate where unexpected or interesting new problems presented themselves and needed to be tackled.
- **Appendix:** Any additional information.
- Style notes: Number your pages. Use minimum 11pt Arial font, 1.5 spacing between lines. Full justified. 1 column per page. For axes, convert to real units of time (e.g., seconds (s)), not 'frames'.

Final report - *June 14, 2019*

- You should bring your Primary supervisor a USB key to the lab containing:
 - All of the data that was collected.
 - All of the code that was written.
 - A *.pdf of the final report.
 - Your Mid-term presentation *.key, *.pptx, or *.pdf
 - Supplementary videos and materials.

Your Primary supervisor will upload these materials to your folder on the lab server and return the USB stick to you.

- You should also print out one hard copy of your final report and bring it to your Primary supervisor.

Final presentation – *Tuesday, June 18, 2019, 10:30AM, Room SV 2615*

- You and the other project students will each present for 20 minutes with 5-10 minutes for questions and answers afterwards. All of the lab will attend. You will not attend the other students' presentations unless this is explicitly agreed upon with your Primary supervisor and the other student(s).
- You are expected to have slides that include:
 - **Front page:** Project title, date, supervisor, name, project type (semester or master project).
 - **Outline of your presentation** (optional)
 - **Introduction:** Expand on the overarching goal of this line of research, its importance, and the specific subaim you tackled in your project.
 - **State-of-the-art:** How have others tried to solve this subaim before you?
 - **Methods:** Which approaches did you take to solve this subaim?
 - **Results:** Justify why you took specific approaches to tackle the subaim. Summarize your findings with figures that have readable plots with labeled axes and scales. Do not necessarily present results in chronological order. Present results in an order that makes conceptual sense.
 - **Discussion:** What are your conclusions? How are they supported by your results? How would you have done things differently if you could do the project again? How should future researchers follow up on your work?
 - **Original Gannt chart:** Present your original Gannt chart. Note where deadlines weren't met and why they weren't met. Indicate where unexpected or interesting new problems arose that needed to be tackled.
 - **Style notes:** Have a consistent slide format. Black text on white background is typical. Embed all videos so the presentation can be stand-alone and work on any computer. Keynote is preferred over Powerpoint or a pdf but not required.
- Feel free to use the template slide provided: Presentation_TEMPLATE.key (or *.pptx)
- Send Pavan your final presentation by Slack the same date as your presentation.

Grading criteria

- You Semester project will be graded using the following criteria:
 - **Quality of work** (40%) - E.g., quality of theoretical or experimental work, quality of development work, amount and quality of results.
 - Tip: A pig with lipstick is still unmissable. Put consistent energy and effort into solving the problem you are tackling throughout the semester. A good final project report and final presentation cannot compensate for low-quality work.

- **Quality of work methodology** (10%) - E.g., rigor, timeliness, good resource management.
 - Tip: Do a great job on every task you tackle toward achieving your subaim. This means thinking about why you make design choices, performing proper positive and negative controls for experiments, collecting enough data to make a supportable conclusion. Try your hardest to do things on your own but if you hit a roadblock, seek out the advice of your Primary Supervisor and/or Pavan. Try to meet your Gantt chart goals.
- **Independence/Initiative** (15%) - E.g., contribution of own ideas, initiative taken.
 - Tip: Being a scientist or engineer means ‘owning’ your project. This means that you don’t simply do what you are told. Instead you identify the core challenge, brain-storm multiple possible solutions (including those that your advisors may not have thought of), and test those different possibilities. You should want to have enough data to justify your final choices. This takes mental and physical energy but also makes the project much more rewarding.
- **Quality of report** (20%) - E.g., quality of structure, presentation, figures, literature/background review, critical analysis of approach and results.
 - Tip: In research, if a project isn’t (well) written up, it was effectively never done. Science moves forward based on the steady accumulation of knowledge from the efforts of many researchers. To achieve this we rely on written documentation of this work. Therefore, you must convey **what** you did, **why** you did it, **how** you did it, and which **conclusions** can be supported by the data. These details must be clear (easy to understand) and comprehensive (no missing information).
- **Quality of oral presentation** (15%) - E.g., quality of structure, presentation, figures, movies, answers to questions.
 - Tip: One important transferable skill is the ability to present what you did in a clear manner. You should aim to ‘tell a story’ about your work. Lead the audience through (i) the ‘big picture’ reason for your project (e.g., why build a fly robot?), (ii) how did you contribute to the big picture (subaim), (iii) what was done before (state-of-the-art), (iv) what did you do (results), (v) what conclusions can you draw from these experiments (discussion), (vi) what might you do in the future (perspectives). Your slides should be easy to read and aesthetically consistent. We encourage you to use movies or live demonstrations.

Signatures:

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Prof. Pavan Ramdya

Primary supervisor

Student

Lausanne, _____ (YY.MM.DD)