The Frazzoli Experience

This document describes organization and procedures for the Frazzoli lab.

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This document is a work in progress.

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TBD

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TBD

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TBD

1.4 Who does it

1.4.1 Complete roster

The official and updated list of all the people affiliated to the lab is at this page on the IDSC website, where you can also see their contact information.

This documents only lists the people that have specific roles.

1.4.2 People in administrative roles

These are the people who have an administrative role—they deal with student enrollment, supervision, evaluation.

- Emilio Frazzoli is the **director** of the lab.
- Andrea Censi is the **deputy director**.
- Maurilio Di Cicco is **oberassistent**.
- Annina Fattor is the **lab manager**. She makes sure that the people above remember to do what they are supposed to do.

1.4.3 People in technical roles

1.4.3.1 Safety officers We work with heavy equipment that is potentially unsafe if not used properly. Moreover, we work on autonomy: not only we have heavy equipment, but that heavy equipment is autonomous! Therefore, we have *two* safety officers:

- Marc-André Corzilius (Mac) is **physical safety officer**. He provides training and guidance regarding the physical environment and tools. Operating our equipment without proper training and without respecting best practices endangers everybody's safety. Conscious transgression of those rules is ground for immediate termination of a student's relation with our lab.

1.4.3.2   IT support   Marc Albert is the **IT support person**. If somebody need access to accounts or machines, he is probably the person to ask.

2   Facilities

2.0.1   Operational offices

All our offices on ETH main campus are in the ML building directions.

In case finding any room is unclear, please refer to the floor plans.

Starting from the entrance from the staircase connecting to the ML hall our rooms are:

ML K 32.1 - Prof. Emilio Frazzoli's office

ML K 32.2 - Annina Fattor's office

ML K 37.1 - IDSC library / meeting room

ML K 37.2 - Dr. Andrea Censi's office

ML K 32.3 - Dr. Jacopo Tani's office

ML K 37.4 - Postdoc room

ML K 37.5 - Coffee room

ML K 43 - Student working room

ML K 39/41 - Rooms belonging to our group but currently unused

2.0.2   Autolab, Autolab control room (Duckielabs)

Number of seats (ML F 44.2): TBD

Map and Direction TBD

2.0.3   General rules about spaces

At the beginning of each semester, the door signs of the student rooms should be updated. One PhD student will be responsible for the student room per semester.

If you are working either on your master's thesis or as a full-time assistant, you are allowed to occupy one workplace full time. You may leave your stuff (like computer, literature, etc.) on your desk.

If you are working only part-time in the room (e.g, semester project, Bachelor's thesis), then you should not occupy a workplace full-time. Please clear your desk every time you finish working. You may leave your stuff inside the room, but please make sure that other students have the possibility to use the desk as long as you are not using it.

Generally, it is the shared responsibility of all students to properly organize the distribution of workspaces. There should be enough workplaces for all of you. Please notify your supervisor only if collisions are unavoidable and unacceptable.

Please always lock the door if you are the last one to leave the room. Other students might have left their stuff (laptop, wallet, etc.) in the rooms.

If you have finished working on your thesis or project, please do not forget to remove your stuff from the rooms prior to returning the key.

3 Research

TODO: discuss main research directions of the lab

4   Academic integrity

TODO: principles of academic integrity, etc.

5 Teaching

Every year we offer these three courses:

- [Control Systems I] Autumn semester
- [Control Systems II]Spring semester
- [Autonomous Mobility on Demand]Autumn semester

6 Administrative procedures

6.1 How to buy/order materials

0. Students cannot order items and cannot get reimbursed if they do order something. For all orders students should contact either Mac or Annina as described below.

1. Orders: For hardware orders (mechanical, electrical, research-related) for the lab - contact Mac.

2. Office ware: Other items (e.g. books, accessories for laptops, other) -> put it onto the order list on google drive (with all the information needed) Annina's spreadsheet TODO: add link

Note: Katharina and Annina are the only ones that can process orders with ETH credit card.

3. Autolab: see autolab rules

4. Conferences: Please book flights and hotels on your own and ask for reimbursement through ETHIS after getting the approval. If your budget is tight, contact Annina and we will find a solution.

5. Reimbursements: Please scan the whole receipt – it has to be clearly visible what you bought and describe it accurately (what occasion, date, people you were with (if it was a lunch etc.)). Reimbursements requests that do not respond to these requirements will be declined.

6. Reimbursements of flights: ETH launched a project for the reduction of CO_2 emissions and therefore wants to have specific information about all the flights. Please indicate : class (economy, business, first); flight no.; no. of persons divided by semicolon into the Buchungstext-field.

6.2 Borrowing materials

TBD

6.3 Key request procedure

The scientific supervisor writes an e-mail to Katharina Munz (CC Annina Fattor) with the following information:

- full name of the student;
- the macro project the student is working on (ex. GoKart, Autolab, etc.);
- room the student needs access to (ex. ML K 43);
- the period (starting and end date) for which the access is needed.

The student will get an e-mail as soon as the key is ready for pick up.

Usually, the student will be able to pick up his/her key within one or two days at the ISC Loge in LEE F314, Leonhardstrasse 21, Open Monday to Friday, 7.30 - 12.00 and 13.00 - 17.00. He/She will get an e-mail as soon as the key is ready for pick up.

7 Accounts

7.1 IDSC infrastructure

7.2 Github

7.3 Slack

This is our group-Slack.

7.4 Calendar

To get access to the group calendar, please contact Marc Albert via Slack. This step is handled during the onboarding procedure.

7.5 Mendeley

To get access to the group's Mendeley, please contact Marc Albert via Slack. This step is handled during the onboarding procedure.

7.6 Overleaf

To get access to the group's Overleaf-pro team, please contact Marc Albert via Slack. This step is handled during the onboarding procedure.

7.7 Rudolf

To get access to the Rudolf, please contact Marc Albert via Slack. This step is handled during the onboarding procedure.

7.8 Zoom accounts and other teleconference software

We use zoom as videoconferencing service. Every official meeting is recorded on the group's calendar and has a constant zoom link associate with it, to allow remote attendance.

7.9 Policies

7.9.1 No email policy, no personal messages

We do not like emails, because we receive plenty and it is easy to miss important ones.

Keep the work related conversations on Slack. Our Slack is organized it with #general, #research-directions, and #project-specific channels. There will be an appropriate channel for each topic.

When in doubt on which channel to use, go for the #general one. Do not send personal messages, but use the dedicated #research or #project-specific channels. We like sharing.

7.9.2 No attachments

We like email attachments even less than emails. If you have an attachment to share, use other means.

- Videos, working files and spreadsheets go in the dedicated Google drive project folder, which was created during the onboarding.
- Machine readable files go in the appropriate Github repository.

This document is a work in progress.

8 Life of a Ph.D. student in the lab

8.1 The defense

8.1.1 The snake-fight portion of the thesis defense

During the thesis defense you will have to fight a snake. Please see these FAQs about the "snake fight" portion of your thesis defense.

9   Grading

We have predetermined grading criteria. We weight the different criteria depending on the project level.

9.1   What are you graded on?

- Rigor: mathematics, data collection, experimental procedures.
- Placing the work in context: assessment of the state of the art, technical preliminaries.
- Quality of the reports: structure, flow, attention to detail.
- Quality of the code: see "code quality" section.
- Quality of the presentation.
- Imagination and creativity.
- Being a good citizen of the lab: demo participation, proactivity.
- Technical contributions beyond the particular project.

9.2   Who is evaluating you?

- Rigor: your scientific supervisor(s).
- Placing the work in context: your scientific supervisor(s) and mentors.
- Quality of reports: your scientific supervisor(s) and mentors.
- Quality of the code: Jan, our master of software.
- Quality of presentation: by group members attending the presentation.
- Imagination and creativity: evaluated by your supervisor(s).
- Being a good citizen of the lab: evaluated by averaging the whole group's feedback, including your peers.
- Technical contributions beyond the particular project: feedback from the whole group, including your peers.

9.3   What is the weight of each grading criteria?

It depends on the level of your project. We weight differently: (a) master theses, (b) semester projects, (c) bachelor theses and (d) studies on mechatronics.

10 Master Theses

10.1 Application

Students apply through Sirop

10.2 Supervision

We distinguish between:

1. The **scientific supervisor**(s) for your project. This is also called Co-Betreuer on MyStudies. This is a person with a Ph.D. who supervises the project in addition to prof. Frazzoli.

2. The **mentor**(s) for your project - this is the person that follows you day-to-day. It might be a postdoc, Ph.D.student, a research staff person. In some case, the mentor and the scientific supervisor are the same person.

10.3 Timeline for a master thesis project

A Master thesis is assumed to be a full time commitment.

Given t as the start time, the schedule is expected to be:

- $t + 2$ weeks: lab orientation; get to know the system.
- at $t + 2$ weeks: choose the mini-project from the pool of mini-projects.
- at $t + 6$ weeks: end of mini-project. mini-presentation. mini-evaluation. This is a formal moment in the lab and the outcome will influence your master thesis project.
- at $t + 4$ months: **mid-way evaluation** according to factors below. Excludes "quality of reports", as the report is probably still to be written. This is a formal moment in the lab.
- at $t + 6$ months: presentation and end of thesis.

10.4 Mid-way evaluation

Refer to the Checklist-2 middle for details.

10.4.1 Deliverables timeline

You are expected to provide a final version of the thesis on the day of your defense presentation.

A draft of the thesis will be sent to your supervisor(s) and mentors at least two weeks prior to your defense presentation.

A draft of your presentation will be sent to your supervisor(s) and mentors at least one week before the defense presentation.

Extra time can be awarded exclusively in extraordinary cases.

10.5   Grading

These are the factors that are taken into account when evaluating your master thesis:

- 20%: Rigor.
- 20%: Quality of reports.
- 20%: Code quality.
- 10%: Quality of presentation.
- 10%: Placing the work in context.
- 10%: Being a good citizen of the lab.
- 5%: Imagination and creativity.
- 5%: Technical contribution beyond the particular project.

Results of particular quality are awarded up to a bonus 10% points upon recommendation of the supervisor(s).

11   Semester projects

11.1   Application

Students apply through Sirop

11.2   Grading

These factors will influence the evaluation of a semester project:

- 15%: Rigor (mathematics, data collection, experiments).
- 15%: Quality of reports.
- 15%: Code quality (see "code quality" section).
- 10%: Quality of the presentation.
- 15%: Placing the work in context (assessment of the state of art, technical preliminaries, etc.).
- 15%: Being a good citizen of the lab (includes demo participation).
- 10%: Imagination and creativity.
- 5%: Technical contribution beyond the particular project.

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12 Bachelor theses

12.1 Application

Students apply through Sirop

12.2 Grading

During a bachelor thesis we look for potential:

- 15%: Rigor.
- 15%: Quality of reports.
- 15%: Code quality.
- 10%: Quality of presentation.
- 10%: Placing the work in context.
- 15%: Being a good citizen of the lab.
- 10%: Imagination and creativity.
- 10%: Technical contribution beyond the particular project.

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13 Studies on Mechatronics project

13.1 Application

Students apply through Sirop

13.2 Grading

- 15%: Rigor.
- 10%: Quality of reports.
- 10%: Code quality.
- 15%: Quality of presentation.
- 20%: Placing the work in context.
- 10%: Being a good citizen of the lab.
- 10%: Imagination and creativity.
- 10%: Technical contribution beyond the particular project.

14 Software development

14.1 Policies

14.2 Code quality measures

- Following conventions
- Unit tests
- No bad habits that make the code unmaintainable

The following characteristics are desirable: Many short source files (as opposed to few large files), functions with few lines of code, modularity, minimal redundancy, use of immutable objects, tests and test coverage, comments, uniform code format.

Typically, these objectives are not achieved in the first version of the implementation. The staff will give you suggestions on how to modify your code in order to come closer to the above standards. Please give the suggestions of the reviewers a high priority in your schedule.

Make your work visible: push your code modifications to Github no later than at the end of the day. That way, reviewers can give feedback immediately and coordinate the work better. Only commit your own source code. If you adapt a code snippet from another source, state the origin and give credit, for instance via a URL.

14.3 Good references to read

15   Paper writing

15.1   Process

15.2   Authorship policy

16   Internal procedures

16.1   The student tracking spreadsheet

Goal: make sure we don't forget any procedure connected to student supervision

Access: Andrea, Maurilio, Postdocs, Ph. D. students, Annina, research engineers.

Link to student tracking spreadsheet

16.2   Meeting notes

Goal: document our meetings

Access: all lab people

Link to meeting notes

16.3   The big TODO list

Goal: not forget what we need to do

Access: all lab people

Link to big TODO list

16.4   Definition and advertising of projects

16.5   Emilio's cockpit list

Goal: prioritize Emilio's actions so that nothing falls through the cracks

Access: Andrea and Annina