Annotation: This is a research onboarding guide (or "policy sheet") for all undergraduates and masters students who are conducting robotics research in ROAM Lab under my supervision. This is a living document that was initially drafted in Fall 2020, and has since been updated every semester that I supervise a new student. The intent of this document is to serve as an easy one-stop reference for research expectations, norms, and prerequisite trainings relevant for becoming a member of the lab. In particular, I add notes about expected levels of formality when communicating in-person on online as this is often a student's first research experience. The goal is to minimize uncertainty about when/how often/how to communicate with me or other lab members, and to facilitate a sense of belonging and familiarity with the physical and digital lab spaces.

I typically go over this document together with a new student during our first 1x1 meeting, in which we decide on a regular weekly-meeting schedule and estimated weekly research commitment. We also discuss my motivations behind my policies, and how the research experience might fit in with the student's personal, technical, and/or career goals.

Ava's Project-Student Onboarding Guide
Last updated: 9/14/2023

1. Introduction

Welcome to the lab! This document contains general information about logistics and tools that you'll need to set up before diving into your research project. This also serves as an accessible reference for later.

You should skim this doc if you're reading it for the first time. If you just want to skip to the checklist of things to set up,

2. Contact info for Ava, Matei, and other PhD students in MyHand Orthosis Team

Project students usually have one PhD student as a direct supervisor (likely me, if you're reading this). Matei (aka Prof. Ciocarlie) is the head of the lab, also called the PI or "principal investigator", and is my supervisor.

Redaction: Here I introduce other PhD students who I closely work with and describe their main research topics.

You can call everyone in the lab by our first names. Don't worry about pronunciation; you'll get the hang of them eventually. Similarly, please have patience with us as we work on saying your name… but do keep correcting us!

> If you're curious: Matei's name is pronounced "mah-tay". Matei's last name is pronounced "<u>cho</u>-kar-lee-ay." (emphasis on first syllable).
> Ava starts with a long-A "ayy" vowel.

> **Redaction:** Here I describe pronunciations of the other PhD students and a list of our preferred pronouns.

Please immediately correct me if I get your pronouns wrong.

> Ava's email: [email]
> phone: [phone number]
> > For me, read/response times are fastest with email / Slack > text >>> call.
> > No need to use formal language in emails.
> > Put your name if you are texting me for the first time so I don't ignore you.

> Matei's email: [email address]
> > Matei is also pretty responsive in email and Slack, if you need to contact him.

3. Meetings, Communication, and Work Hours

You are expected to attend our MyHand Hardware subgroup meetings (usually 45min in lab, TBD for Fall 2023). **Let me know if you have a conflict with this time slot.** This meeting includes all of the project students and me, and is our main method of updating progress and pitfalls. Matei sometimes attends. This meeting is very chill, even if Matei is present.

You are encouraged (but not required, if you have a time conflict) to come to our weekly lab meetings, Wednesdays 12-2pm (currently hybrid format). If you come in-person, it starts at noon with free lunch (conference room next to lab). The technical portion starts around 12:30. If you are remote, it's on zoom: [zoom link]. Your "final report" of the semester (especially if you are doing research for-credit) will likely be a written memo and presentation at our lab meeting. We will talk more about how to prepare and arrange schedules well beforehand.

The MyHand PhD students and Matei have a meeting every other week to discuss engineering issues (project students are invited-but-not-required-to-attend) ,

currently 10am-11 Mondays. Occasionally I'll want to present your updates or ask you to present, and this may involve leaving prototypes on my desk.

By the end of your first week, we will have set up expectations for 1x1 meetings. This varies per person, but basically we have a regularly scheduled time where we will both be in lab or on videochat, for somewhere around 30-45min. Think more "office hours" or "scheduled coworking time"

In addition to regular meetings, you should feel free to email (or text or etc., see above) whenever you have questions. I am also generally available to chat when I'm in lab (most reliably 11-6 on weekdays; Thursdays I often WFH but am available over videochat); it's best to give me at least an hours' heads-up if you want to show me something in lab at a particular time.

I might send you emails at irregular hours or weekends (I'm a night owl). There's no expectation that you'll respond to them or even look at them outside of 11am-4pm weekdays. If for some reason we're working on something time-sensitive (unlikely, unless we're coauthoring a paper), we would refine these expectations together and beforehand. Similarly, feel free to send me emails at weird times and I'll read them fairly promptly, but later.

If you really really need me to respond to something right away, put "[urgent]" in the subject or the top of the message. Or call me.

You manage your own work schedule; there are no set work hours besides the scheduled meetings. If you are doing research full time during the summer, I assume an average of 35-40 hours/week; during the semester we will both agree upon a reasonable commitment estimate. These are just estimated averages: in research, sometimes you'll have really busy weeks and other weeks will be chill.

The answer to "Can I take X day(s) off" is always yes. This could be for summer vacations, extracurriculars, busy class schedules, mental health days, etc. But you should always give me a heads up.

The theme here is "always keep Ava informed of what you're up to", and try not to surprise me. The only "bad work performance" you could do as a project student is to disappear with no warning.

4. Research Expectations

My priorities are in order of importance: 1) you learn something through doing research, and 2) you are having fun / feel like you are working on cool stuff. My personal philosophy is that if these two objectives are met, then good research will come out of it. But things like "productivity" or "results" come secondary.

Research is about tackling hard, non-obvious problems. Although we'll do our best to make sure your projects have achievable goals and milestones, we might underestimate how deep the problem is. So don't get discouraged if you struggle. We expect you to get stuck sometimes; if the project was trivial, you wouldn't be working on it.

Getting stuck is fine. Being lost is not fine. If you can't solve something <u>and</u> don't know what to try next, ask for help. If you spend more than a few hours trying to debug one thing, also ask for help. Time is our most limited resource in research, and we don't want to waste yours. (you should spend time trying to understand what's going wrong, and try some debugging yourself, if you're stuck)

When working on research projects, our goal is to "fail fast". Basically, at every step of the way, we want to find the quickest and easiest way to prove if and how our new concept might not work. That way, we can quickly adjust our plans. Keep this goal in mind when designing prototypes or experiments.

5. ROAM lab

Lab is located in [Building name, room number].

> **Redaction:** Here I describe walking directions to the lab when arriving by elevator, as the building layout is confusing.

Once you arrive for the first time, someone will tell you the doorcode. You can then access the lab whenever you want.

Any of the non-PhD desks are available for use. (The PhD desks include the L-shaped desks; also the desk across from the 3D printer) Depending on how many people we have in the lab, it might be a hot-seat arrangement or you might be able to reserve desks. If you're spending a lot of time in lab or generating a bunch of parts, we'll find a cabinet for you to store materials.
Assuming I'm not at my desk, you are welcome to use my desk.

We maintain a shared Windows desktop for Solidworks, and multiple Ubuntu machines for coding. You can also do research on your personal computer; we can get you software if you don't normally have access to them.

Lab should be providing all tools and materials being used for your research project; you shouldn't be spending money. (e.g. if you want to use your own 3D printer for convenience, we will provide filament).

6. **Checklist of Tasks**
    1. Complete online training courses on RASCAL (you might have already done some of these for previous classes or clubs)
        i. (research ethics and conduct) https://www.rascal.columbia.edu/tc/course/TC0094/courseOverview
        ii. If you plan to work in the MechE Machine Shop space or use its tools (machine shop safety training) https://www.rascal.columbia.edu/tc/course/TC0600/courseOverview
        iii. If your project involves interacting with patients at the hospital, you need to complete additional trainings:
            1. (Human-Subjects Protection) https://www.rascal.columbia.edu/tc/course/TC0087/courseOverview
                a. do the FDA Regulated Research Module with this training; see https://research.columbia.edu/sites/default/files/content/RCT%20content/Add_Instructions_TC0087.pdf
            2. (HIPAA Training) https://www.rascal.columbia.edu/tc/course/TC0019/courseOverview
            3. (Conflict of Interest Disclosure) https://www.rascal.columbia.edu/coi
                a. Our research is sponsored by NIH
                b. Note: this should be filling out a form, not a training.
            4. (Good Clinical Practice Training) https://www.rascal.columbia.edu/login/tc3450/
    2. Let me know if you have any food, latex, metal, etc. allergies.
    3. If you plan on contacting me through SMS, text me with your name so I can add you to my contacts.
    4. Create or share a google calendar of your availability with Matei ([email address]); he only needs to know whether you're free/busy.

5. Set up a google drive folder for research files and share it with me ([email address]); when we wrap up projects and/or when you leave the lab I will need a copy of all of your research works.
6. Create some system for writing sharable notes & research documentation. Previous students have used Google Drive (running doc or slidedeck), a shared Notion page, Github readme's, or Asana tasks.
7. Make sure you have access to the following by the end of the week:
    i. Lab mailing list: [email address]
    ii. Lab google drive (repository for lab meetings): [web link]
    iii. Lab Slack: [web link]
8. Specific things to your project:
    i. I might have linked you to scientific papers ([how to read a paper](#)) or documentation about previous work on this project. You should skim through them.
    ii. If your project involves mechanical prototyping, let me know whether you have access to Solidworks (requires Windows). Get user access (at minimum drill-press and general tools, 3D printers) to the [MechE machine shop](#) or the [Columbia Makerspace](#). If you have minimal design experience, let me know.
    iii. If your project involves electronics, download [Arduino IDE](#). If you have zero experience with circuits or Arduino, let me know. Also let me know if you have zero experience with linux or C++ so I can send you some tutorials.
    iv. If your project involves ROS and you are new to it, work through [these tutorials](#) (5-8, 12-13 are most relevant, but you should skim and conceptually understand 1-4). Our ROS system also requires some familiarity with python and Linux/Ubuntu.
    v. If your project involves developing a codebase or software, let me know your Github username (or set one up). I will add you to our lab repository(ies).