

JEREMY R. MANNING, PH.D.

LABORATORY MANUAL

COMPUTATIONAL MEMORY LABORATORY, OUR SCHOOL

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Introduction

This lab manual is intended to serve two purposes. First, the manual provides a comprehensive overview of official lab policies, expectations, facilities, and personnel. Second, it provides a set of general tutorials and a list of relevant links, pointers, and/or references related to the techniques we employ in our research.

WHO IS THIS LAB MANUAL FOR? Every new lab member should read the latest version of this lab manual in detail and reference it later as needed. Periodically throughout the document, you will see margin notes with listed TASK items. Completing your read through entails both reading the contents of the manual and completing the relevant TASK items.

WHAT SHOULD YOU DO IF YOU DON'T UNDERSTAND SOMETHING?

If you don't understand something you read in this manual, it is important that you *ask another lab member for help*. Every member of the lab brings their own unique knowledge base, training, life experiences, and perspectives. Respecting and celebrating those differences drives the science we do. If you're new to the lab or new to a particular technique, you might feel like a newbie today—but chances are good that if you stick around for a bit someone else will be seeking your expert opinion before you know it. In addition to learning, there's another good reason for asking for help: if you don't understand something you read in this manual, there's a reasonable chance that you've discovered a mistake!

WHY IS IT WORTH MY TIME TO READ THROUGH THE MANUAL?

Aside from pursuing your own curiosity, a major reason that you've decided to join an academic research lab is probably because you want to gain training or career-advancing experiences. This manual summarizes the collective wisdom of past and present lab members in a way that we think will best allow you to achieve your objectives. *Learn from it, challenge it, and add to it.*

TASK: Upon reading through this lab manual for the first time, please make at least one edit. You could correct a typo, clarify something that's unclear, add a comment, etc. Focus your edits or additions on sections that are most relevant to the work you want to do. Importantly, be sure to push your edits to the manual's github repository so that everyone can benefit.

TASK: If you don't understand something, ask another lab member for help!

Official lab policies

Our lab's policies are intended to provide a framework for *maximizing efficiency*. Achieving our peak efficiency as a lab means we are being as scientifically productive as possible, in terms of knowledge discovery (learning new stuff) and dissemination (papers, talks, conference presentations, publicly released datasets, software, etc.). It also means that our fellow lab members are achieving their training and career objectives. To achieve peak efficiency we need to succeed on two fronts:

- **Communication.** We want to foster an environment where everyone feels comfortable contributing to the collective dialogue. Our lab meets regularly to discuss logistical (e.g. temporal, financial, sociological) and technical issues. We also use a variety of software packages to synchronize and facilitate communication within our lab and between our lab and the broader scientific community.
- **Resource allocation.** Our lab resources (e.g. equipment, time, money, attention) are finite. We want to foster an environment where lab resources are used as efficiently as possible to achieve our collective goals.

Your job as a contributing lab member is to help us to achieve our collective peak efficiency (as a lab) while also maximizing your own training and career potential.

The lab hierarchy

Our lab is organized in a roughly hierarchical structure. Each lab member's position in this hierarchy is determined primarily by two factors: the lab member's job title and the amount of time they have worked in the lab. Moving up in the hierarchy generally entails working in the lab for some amount of time, gaining experience by working in other labs, and/or earning academic degrees. The lab hierarchy is intended to serve as a general framework for estimating what is expected of each lab member, e.g. in terms of research, super-

vising and mentoring, training roles, and other lab responsibilities. The levels of the lab hierarchy are defined as follows:

- L1-x: Undergraduate research assistants.** This category includes undergraduate students (currently enrolled at OUR SCHOOL) who are pursuing an active undergraduate research program in the lab. An active undergraduate research program may include for-credit projects (such as an independent study or an honors thesis project) or not-for-credit projects.
- L2-x: Postbaccalaureate research assistants.** This category includes lab members who have already earned an undergraduate degree (e.g. BA, BS) but who have not earned a graduate degree, and who are not currently enrolled in a degree-granting graduate program.
- L3-x: Postgraduate research assistants.** This category includes lab members who have already earned a non-doctorate graduate degree (e.g. MA, MS) but who are not currently enrolled in a degree-granting graduate program.
- L4-x: Graduate students.** This category includes lab members who are currently enrolled in a degree-granting graduate program (generally working towards a master's degree or doctorate).
- L5-x: Postdoctoral researchers.** This category includes lab members who have earned a doctorate degree and are not currently enrolled in a degree-granting program.
- L6-x: Principle investigator.** This category includes lab members who have successfully obtained external funding for an independent research or training project, and whose funding is currently active.
- L7-x: Lab director.** *There can be only one...*

Note that the “x” should be replaced with the time elapsed since you joined the lab, in years. Generally speaking,

In addition to the primary levels enumerated above, certain support roles in the lab exist outside of the main lab hierarchy:

- S1-x: Administrative support staff.** This category includes lab members who, regardless of their academic degree, are hired primarily to provide administrative assistance (e.g. assisting with grant or paper submissions, registration, scheduling, coordination) to facilitate scientific research in the lab.
- S2-x: Research specialists.** This category includes lab members who, regardless of their academic degree, are hired to bring a specific special scientific skill to the lab (e.g. programmers, graphic artists).

Scheduling

Complex dynamic systems can be difficult to understand (e.g. describe, compute with). Fortunately for us, we do not need to start entirely from scratch with respect to attempting to organize some complex dynamic system we care about in our lab. For example, we can use tools like calendars and other software packages to organize and understand our own temporal dynamics. Our lab's scheduling policies are intended to facilitate lab member interactions between ourselves, our collaborators, and our experimental participants.

Attendance policy

As you move up in the lab hierarchy, our policy is to afford you increasing scheduling flexibility (which, in turn, assumes increasing responsibility on your part). Increased *scheduling flexibility* comes in the form of less frequent check-ins (e.g. times you are required to meet with your supervisor) and less structured research time (e.g. your level of independence as a researcher, as determined by your supervisor). Increased *responsibility* comes in the form of increased expectations placed on you as a researcher (in terms of research effort and productivity).

Lab calendar

Scheduling lab events using Doodle

Mandatory lab events

Optional lab events

Scheduling participants

