

**The Lab Manifesto
of the University of Oregon
Cognitive Modeling and Eye Tracking Lab
By Anthony Hornof - 10/10/03**

This document describes the work processes and philosophy of the University of Oregon Cognitive Modeling and Eye Tracking Research Lab, which is directed by Anthony Hornof. The document is a declaration of the principles, policies, and intentions of the lab, and is primarily intended for students working in the lab. “The lab” is both a physical space and a group of people. Being a part of the lab is a rare and extraordinary opportunity to work on cutting edge human-computer interaction research problems. What does this involve?

1. Research. Research is the discovery of new knowledge. Working in the Cognitive Modeling and Eye Tracking Lab is an opportunity to participate in the development of new knowledge pertaining to computer simulations of human information processing, eye tracking as a source of data for informing and validating the simulations, and eye tracking as an input device for human-computer interactions. Every piece of work done in the lab is aimed towards developing new understandings of human-computer visual interaction, and new applications for the knowledge that is discovered in the lab.

Some of you are getting paid with funding that comes out of the first few grants that I have received in my academic career. It is essential that I perform well on these grants if I am to continue receiving such funding. To perform well, the research must be performed with the same rigor and intensity of that coming out of the top research labs in the country. We must produce on par with national and international research standards. Look beyond your colleagues on campus to the bigger academic and research community. Work as hard as students and researchers at Stanford, Berkeley, M.I.T., and Carnegie Mellon. Be a star.

2. Work. As a general rule of thumb, work is hard. That’s why they call it “work.” Sometimes it is also stressful. Sometimes dull. Sometimes tedious. In general, when you are working, there are other things you would rather be doing, such as drinking a cappuccino at a cafe, reading a magazine, surfing the web, reading non-research-related email, skiing, hanging out with friends, watching TV, and so on. Sometimes, but not always, when you are working, you find yourself in a “flow” activity during which time passes by quickly while you are also being very productive, and during which you are being challenged at exactly the right level. This is great. But you cannot get into a flow activity with every piece of work that you do. Though sometimes tedious, working is always a dignified activity, and it builds discipline and self-respect.

To earn a Ph.D., you need to dedicate your life to it. For a period of time, this will have to be the most important thing you do in your life. If you sleep 56 hours in a week, then you will need to be spending at least 57 hours a week on your Ph.D.

3. Timelines. Research explores uncharted territories. As such, it is difficult or impossible to predict exactly where a project will go and how long it will take. One of the best techniques to combat these unknown territories, and to make the fastest progress that you can, is to plan out the project as best as you can, and to stick to your plan as closely as possible. Sometimes it is difficult to break up the bigger chunks of work, and the bigger goals, into smaller pieces of work. However, attacking this difficult task head-on is part of your responsibility in this lab. Attacking it regularly will make you a better and stronger worker for every subsequent project that you pursue in life.

At the beginning of each term (including Spring/Summer as one term), you should provide me with a printed timeline of what you will accomplish that term, broken down week by week. This

means that you will have at least ten tasks (one per week), with target dates, for each term. I guarantee you that the plan will change during the term, but this is no excuse not to plan. I also guarantee you that from term to term you will get better at accurately predicting the outcome of your efforts. You will get better at “Calling the shot.” Continually update the timeline throughout the term, including tasks completed and new tasks that were added. When planning, take into consideration how many hours you will have available for research from week to week.

4. Publications. Publications are the forum for distributing research findings; that is, the new knowledge that is discovered in the lab. Since every piece of work in the lab addresses important research questions, every person working in the lab has the opportunity and obligation to contribute to research publications. What is in it for you? In academia and research, publications are the standard by which a person’s work and intellect are evaluated. If you are an undergraduate, coauthoring a research publication will help you enormously when you apply to graduate school. If you are a graduate student, you should already appreciate that publications will help you with everything in your career, including internships, grants, and academic positions. Publications will also help you enormously if you ever apply for jobs outside of academia: How can an employer seriously question your knowledge of a topic if you are a published author on that topic?

5. Intermediary dissemination of knowledge. Between publications, there are many opportunities to share your findings. These include putting up posters in the lab and in the building, maintaining a web page with your project information, and presenting your work to classes and other groups on campus whenever the opportunity arises. This ties into the next topic, promoting the lab and the research.

6. Promoting the Research. As much as we would like to believe that we intellectuals are above it all, we are in the business of selling. Yes, the research has to be top notch and accurate, but it also has to be sold. The selling does not involve deception or hyperbole. But it does require a specific, concerted effort to win over your audience to appreciate your work and why it is interesting and important. Treat every talk as if it were a job talk. In academia and in research, ideas are a form of currency. In general, as a rule of thumb, nobody cares about your research and what you are doing. If someone in a position to think about and comment on your work is willing to listen to your ideas, you must take the opportunity to sell your ideas.

If you are working in this lab, you need to promote the lab and the research conducted therein. You should, at all times, have a 10-second, 30-second, 1-minute, and 5-minute description of your work ready to roll off your tongue, with slides and screenshots ready on file. The 10-second version is your “elevator talk” that you would give to Bill Gates, Steve Jobs, Dave Frohnmayer, or whoever, if you happened to be riding in an elevator with them and they were your captive audience for just ten seconds. The elevator talk is a success if the famous person says something like “That’s a great idea. Can you send me a grant proposal next week?” You should be practicing and perfecting this 10-second talk at every reasonable opportunity, including to faculty and students on campus.

7. Promoting the students. I will promote all of the students that are working in my lab. I will include you as collaborators when I discuss the work with colleagues and at conferences. I will include you as co-authors for any publications in which you contribute significantly to the research and to the writing of the paper. I will write you letters of recommendation.

Promote each other. Take opportunities across campus to mention in passing the research projects that other lab members are working on. Everyone should be able to give everyone else’s elevator talk. I give elevator talks to my colleagues all the time, promoting my work in ten words or less. Watch me. I will say things like “I have my first research group meeting tomorrow morning” or “The collaboration with Lewis and Clark is going well” or any other

randomly-chosen constructive research-related comment that comes to mind. The effect is vastly different than ten words or less about the weather, or having to rush off to class, or how busy you are. Take every opportunity you can to speak constructively about your research. Contribute to a research community. Create a research community.

8. Supporting the students. I will support the students working in my lab. Support takes many forms. The most important form of support in helping students learn how to do research is to provide them with an intellectual forum in which they can exercise their mind in the formation and carrying out of original ideas on how to look for, capture, represent, and write about new knowledge. This forum can take many forms, but the most valuable is when a research advisor is willing to focus his or her brain power, over an extended period of time, seriously considering, critiquing, and engaging a student in the student's work. This is the most important form of support that I endeavor to provide students working in the lab.

As a general rule of thumb, successful faculty are highly selective in terms of who they will engage in intellectual debate, and in terms of whose ideas they will engage in a critical discussion. This is to a large extent a healthy survival mechanism to make sure they stay focused on their own inquiry and research. Thus, as a general rule of thumb, successful faculty are in general not willing to focus their brain energy on engaging you in discussing your research. When you find someone who is willing to engage you, and you get along with them, and you find their suggestions to be consistent and helpful, work as hard as you can to engage this person in the highest and most advanced discussions that you can. Go to every meeting as prepared as possible, and having made as much progress as possible.

Other forms of support that I will endeavor to provide to students working in the lab include: the resources that they need to do the work, including lab materials, software, hardware, books, and so on; forums in which the students can have their work and ideas constructively critiqued by other faculty, and preparation for these encounters; a supportive, positive and constructive environment in which other students working on similar problems; and various guidance for developing as a professional researcher, such as the wealth of guidance contained in this manifesto, much of which is intended to support students by helping them to become self-directed researchers.

Another form of support is money. If you are getting paid to do research, you are living a life of luxury. I will make every effort to continue winning grants so that I can support you all with research assistantships. For me to continue winning grants, I need your help. You need to work hard, produce high quality work, meet timelines, and help me fulfill my existing grant obligations. But I will do my part. I will fulfill my grant obligations as best as possible, attend funding agency meetings beyond those I am required to attend, serve on NSF review panels, and make an effort to always be writing a new grant proposal.

9. Collaboration. Collaboration is people working together to do more work, and to do greater things, than they would be able to do working separately. The lab offers many opportunities for collaboration. It generally requires people to meet at planned times, or to have unplanned productive encounters. Talk with everyone in the group about all aspects of all of your projects. Listen to anyone in the group who wants to tell you what they are working on. Having a physical room in which we can make these things happen is a luxury. Space is one the most fiercely acquired and defended commodities on university campuses. One of the best ways to keep it is to use it well.

Be sensitive to the workflows that people in the lab establish. Perhaps look for the signals of when people are focused, and when they are interruptible. Perhaps ask each other if they are interruptible at the moment. It is okay to answer with something like "I need another n minutes" such as if you are in the middle of a timed hour of writing. In grad school, I used to set a digital

timer for 50 minutes, work for solid 50 minute blocks, and take short breaks in between. These short breaks were great times for interruptions. My officemates got into the rhythm.

Perhaps keep a running Post-It pad of questions or comments for each other. Give each other a minute if someone needs to finish typing a sentence or line of code.

When I am working on something that is difficult and tedious, I keep a running Post-It pad of thoughts that creep into my mind that distract me. I jot down a word or two to remind me of the thought later, and I regain my focus.

10. The Lab Space. The lab space itself is a very special place, and I have gone to great lengths to first acquire it and then to make it clean, tidy, ergonomic, efficient, aesthetic, and technically well-equipped. You will continue to see more improvements over time. Let me know if you have any ideas, especially if you find things that we can throw away. But the lab space is nothing without people in it.

Use the lab space. Claim a slot in the bookshelves and store your project materials there. Make coffee. Use the refrigerator. Use the file cabinet. I will provide more filing space if it is needed. I will make every effort to provide a separate ergonomic workstation for each graduate student working in the lab. Graduate students whom I am paying as research assistants should spend the majority of their contract hours in the lab space. We are building a research team. You are paid in part to work together, even if on different projects, and to help all of the students working in the lab learn how to do great research. Perhaps print out a schedule, including the hours that you know you will be at the lab, at your workstation.

For undergraduates working in the lab, I will make every effort to provide shared ergonomic workstations for your use. Printing out and displaying the hours you intend to work in the lab will also likely be helpful.

Collaboration requires talking. If you find talking in the lab distracting from your solo work, feel free to use earplugs and/or headphones with music (provided that the music does not just provide just another distraction). I will provide earplugs and also a set of airport runway ear-protectors that you may use if people talking in the lab is distracting to you. I use both together when noises distract me, such as on an airplane. I hereby decree that wearing such devices will be perceived as normal and socially acceptable in the lab, and that every effort will be made to gracefully get the attention of people wearing such devices when it is needed.

11. Communication. Talk to each other. Communicate in all ways that seem appropriate. Call people. If you have a pressing need and I am not in the office, it is okay to call me at home. My number is 683-1995; it is also listed in the phone book. Use email. Feel free to email the entire group with any questions, concerns, or comments regarding the lab. Leave notes around the lab if you need to. Put a “red tag” on anything that is broken, with your name, date, and the problem.

Read every word of all research-related emails, even the parts that were forwarded. Respond to all email requests within 24 hours during the week, or within 48 hours on the weekend, even if just to say “I got it, I read it, and I’m working on it.” I will make every effort to do the same.

If you have any disappointments or disagreements with how things are going or what is expected of you, please direct these concerns to me privately, and ideally in a face-to-face discussion rather than in an email. I will do my best to do the same. If you have any problems or concerns with this manifesto, please discuss it with me in private.

12. Web pages. Every project in the lab should have a single web page with a few paragraphs that describes the project, and some kind of figure. Be sure to include the goals of the project and the names and affiliations of all personnel involved in the project. Include some sort of figure, with a caption, that captures the essence of the project. Two image sizes is probably best, with the smaller image clickable to enlarge.

Create and maintain your web pages using DreamWeaver (the lab is purchasing one license per member), and send me an updated version at the end of each term. I will link them to the main lab web page. Please keep the design of these pages as simple as possible, along the lines of the current lab web page, which is accessible by clicking on "Research" from my home page. The main benefit of a simple design is that it is easier to keep updated.

13. Meetings. Show up to all meetings with paper and pencil, and take notes. There are a number of ways to collect your notes over time. One is to keep a project notebook. Some researchers carry around nicely-bound blank lined notebooks in which they keep page after page of notes, regardless of the exact topic of the current meeting. This is a great way to do it. I prefer a more distributed system, tearing off pages of notes and filing them in chronological order in hanging files corresponding to the various projects or topics. If you ask, I will gladly show you any of the organizational systems that I use. They are not perfect, but they work okay and would give you a starting point for your own organization.

Come to every meeting with a list of agenda items written down, and leave with action items, stating what they are at the end of the meeting. The next meeting time should also be established or at least discussed at the end of each meeting.

14. Weekly Reporting. Email me a report every Friday that describes the work you did on the project for that week, including a total number of hours worked that week, and a rough breakdown of how the time was spent, in chunks of roughly 1 to 4 hours. Optionally, include a few sentences or bullets on what you intend to accomplish in the following week.

Use these emails to track your own progress, and save them in your own files for yourself. For example, if you spent the week solving a particular programming problem, you might want to include a brief paragraph describing the problem and the general solution, to reinforce what you learned, and so that later you can go back and re-learn from your previous work. The reports are also a good opportunity to communicate things to me. I always read them, though I don't usually reply to these emails.

15. Shared Resources. Some of the resources in the lab are shared. This includes little things like the coffeemaker and the stapler, but also big things like the eye tracker. Please work together to share resources in a cooperative and egalitarian manner. Develop systems or schedules if this helps, and communicate them to the rest of the group.

16. Personal presentation. When you are representing the lab or presenting your work, including at all times that you are at any academic conference or presenting on campus, you should dress in a professional manner. Wear slacks instead of jeans or shorts, dress shoes instead of athletic shoes, and nicer shirts instead of T-shirts. Always dress for the job you seek, not the job you have. Project yourself into your next job.

17. Lab computers. The research in the lab is computing-intensive. The lab computers, including laptops that are loaned out, are intended to be used for research-related and academic work. Keep the configurations and customizations as minimal as possible.

The lab has an infrastructure in place for supporting Macintosh computers, but unfortunately not for Windows. If you need assistance with your Macintosh, just ask. There is a wealth of

technical expertise both in the lab and in the CIS department. If you are using a Windows machine, it is your responsibility to do all system administration on that machine, including downloading regular security updates, configuring firewalls at the correct level of security, removing viruses and worms, reinstalling Windows and all software and data after virus attacks, and figuring out how to print in the department. The CIS systems staff does not support Windows.

The one Windows machine that is essential for the lab operation is the LC Technologies Eyegaze System. It is critical that this machine be kept off the Internet as much as possible, and that all security updates be installed on the occasion that it must be attached to the Internet. Please install only the minimum software required to run your eye tracking applications and experiments on this machine. If this machine gets another virus--it has already been the victim of a severe attack--many of our projects will suffer. I will provide a USB key for moving data to and from this machine.

If your project requires Windows, one viable approach is to use a Windows emulator on a Macintosh, which I will purchase for you. The entire Windows disk image could then be backed up periodically as a set of Macintosh files.

18. Computer Software. I will provide you with all of the software that you need to do your work as effectively as possible in this lab. Let me know what you need. The work should never suffer for lack of a piece of software. However, there should be no illegal software on any of the lab computers, and under no circumstances should you provide copies of lab-purchased software to anyone outside of the lab. We are in the business of writing software, and we fully encourage and endorse legal and proper acquisition and ownership of software.

I will purchase the software you need to do your research, including software that you can keep on a personal laptop (owned by you) for project-related work. The rule of thumb is that we will own one license for each person using a piece of software. For example, we will have a license for DreamWeaver for each member of the lab, and everyone should feel free to load this software onto a computer that will be used only by themselves or another member of the lab. However, you must remove all copies of lab-purchased software from any personally-owned computers when you are no longer actively working on a project in the group.

Let me know what software you need and I will do my best to purchase it for you. Note that educational pricing is available for a lot of software, and excellent discounts are available for a few software packages from the Oregon Educational Technology Consortium (www.oetc.org). Always check OETC.org first for the best prices, especially if you only need a license.

Often, the overhead in buying a piece of software is more in time than in money, such as for little utilities. For licensing and ownership reasons, UO insists that all software be purchased by UO, so I cannot reimburse you for software that you purchase on your own, such as with your personal credit card. The easiest thing to do is to make a list of all of the software that you need, and then submit a purchase order (P.O.) request for a single vendor, such as OETC.org or the UO Bookstore. If a piece of software must be purchased online, and is under \$100, we can use the departmental credit card. There is still time and labor overhead, so again try to bundle up these requests and process them in bunches. I will ask you to assist with purchasing.

19. Serial Numbers. All software should be registered in my name and with my work address. The easiest way to do this is to just staple my business card to the registration card, write "NO MAILING LISTS PLEASE" on the card (to try to limit my junk mail in the office), and then drop it in the U.S. Mail. I will leave a small stack of my business cards in the lab.

Maintain a spreadsheet of all software that you install, with each of the following columns. Perhaps include target platform (Mac, Windows, etc.) if that is possibly ambiguous. A couple example entries are included here. Name the file “Serial Numbers” and back it up on the CD that you burn at the end of each term.

Package	Purchased	From	Registered	How	Serial Number	Notes
Acrobat 4.0	11/3/99	UO Bookstore	11/4/99	sent in postcard	KMW400E7117911-812	
AppleWorks 5.0	11/6/99	OTEC	11/6/99	OTEC Invoice is Proof of License	None provided	

Our work is exciting because we are using computers in ways that has never done before, pushing them into new frontiers, discovering new knowledge, advancing the field of human-computer interaction. Working with computers requires a lot of overhead in terms of time and effort for maintenance. These activities are essential, but the procedures outlined here are tried and true, and consistency in the group will be enormously helpful.

20. Back up your data. It is your responsibility to back up all research-related data on all lab computers that you are using, including laptops that are loaned to you. When your laptop is stolen or your hard drive crashes--and I guarantee that these things will happen eventually--my first and perhaps only question will be “Did you lose any data?” The only acceptable answer is “No. It was backed up.” It is your responsibility to keep a copy of all research-related data at two different physical locations, so that if any single building in Eugene burns down at any moment in time, and all occupants leave the building carrying nothing, we will not have lost any data.

In addition to your own daily, weekly, and monthly backups, each project should burn CDs of all project-related data and provide it to me at the end of every term.

Let me know what you need in order to fulfill these obligations and I will provide everything, including CD burners, blank CDs, hard drives, tape backups, and backup software. We can also discuss lab-wide centralized backup procedures and policies. Feel free to propose anything.

Save intermediary copies of your project files in case you need to revert back to a previous paragraph or section of code that you deleted. Especially as a paper deadline approaches, I backup a new copy of the file every few hours, sometimes even to an external disk in case my hard drive crashes. (Specifically, I create a file folder called “Old” in the directory in which I am working. In this directory, you will find files such as “Lab Manifesto 2am”, “Lab Manifesto 4am”, etc.)

Related to backup is the topic of moving data. Moving data among the various machines that you use should be painless and invisible. Let me assist you in making this happen. If a USB key or other hardware device will help, let me know and I will do my best to provide you with one.

I keep 2GB of data synchronized between my home and office Macintosh computers using a portable FireWire hard drive that I carry back and forth every day, and an outstanding software utility called “Synchronize!” Hence, I always have all my data on three different hard drives. I would consider providing any lab member with a similar synchronization system. The system provides a form of a backup, but file deletions propagate as well, so I also back up to CD or DVD monthly.

21. Academic and Research Honesty. Science proceeds based on the personal reputations of individual researchers. It is of utmost importance that you record, report, and discuss your work and activities accurately and with complete honesty, and that you fully and accurately cite the sources of any materials that you appropriate. Anything less will potentially jeopardize the reputations of every member of the lab, past and present. Academic dishonesty in labwork or

coursework will not be tolerated.

22. Get help. Research projects and graduate school are stressful. Self-help books are useful, such as “Getting What You Came For: The Smart Student’s Guide to Earning a Master’s or Ph.D.” and “A Ph.D. is Not Enough.” Consider joining campus-wide support groups in which grad students get together and help each other to get through the difficulties of graduate school. Consider visiting Counseling Services if you become too overwhelmed by school, research projects, or life.

23. Share your ideas. Think about how we can improve the lab and the research. Think of any new communication systems that might help the group, such as password-protected web pages and data repositories. We have a huge partition on the departmental Unix servers that could be used for repositories, huge web pages, or whatever. Ask me to add you to the lab’s Unix group if you would like access to this partition to set something up.

Take initiative. If you see a book or a little gizmo (for under \$100 or so) that you need for the research, buy it and I will reimburse you. Try new things. Email authors with questions about their work. In general, I will be much more disappointed at opportunities that are lost and ideas that are not pursued than I will be at learning that you tried something and it did not work out so well. Be bold. Take risks. Do great research.