Lab Manifesto for the
Robot Ethics and Aerial Vehicles Lab
Version 0.1

This is a living document describing the philosophy of the Penn State Robot Ethics and Aerial Vehicles Lab. The purpose of this document is to put forth the lab's guiding principles as well as the motivations behind those principles without, in most cases, resorting to strict black and white edicts. The lab is not simply a collection of equipment. Rather it consists of both a physical location, the equipment inside the location as well as the people that compose the group, including the current, future, and past members. The larger purpose of the lab is to advance scientific knowledge and to train the scientists and engineers of the future.

Excelling as a graduate student

The first step towards being a great graduate student is working hard. Working in a research lab is not like a traditional summer job. You must dedicate yourself to the research at hand. There will be aspects of conducting research that you find boring, difficult, or tedious. It's important to push through the boring parts to arrive at results and conclusions. If you are a PhD. student you should plan to dedicate much of your life to research. Expect to work 60 or so hours per week in order to complete a PhD level research project in 4-6 years.

Avoid local minima. In other words, don't get stuck for long periods of time on trivial or tangential tasks. Always try to keep your highest level research goal in mind. For instance, dedicating your time to writing your own personalized software package when other suitable open-source equivalents exist is typically a waste of time.

Get to know your lab mates. You are all in this together. Perhaps more importantly, these people will be an important resource for you once you graduate. You will have a natural connection to them in terms of research area and they may share opportunities with you and you should share opportunities with them. More experienced lab mates can also answer many of your initial questions.

Be prepared for meetings. Take notes. Pay attention. Be respectful.

Guidance.

As your advisor I cannot, nor should I, solve or generate your research project for you. For those seeking a PhD, a doctoral degree signifies that the student has not only mastered a topic, but is capable of recognizing, defining, examining, conducting experiments, analyzing data, and understanding the role of their research within the community for a specific problem. When you complete a PhD you should be the world's for most expert on that topic. Some PhD's (and even some Master's dissertations) change the world. Many do not. Changing the world is not a requirement for your degree, but relevance is. Some collection of people must care about the work you're doing. In other words, your dissertation shouldn't be a pet project with no hope of becoming something meaningful.

You may feel that your dissertation is not complete. There is always more that could be added to the research. For a PhD, it is more about find a suitable stopping point which exhibits that you know how to conduct research. If you really believe in the research, then your postdoc plans should focus on finding a way to continue.

For those attempting a research based Master's degree, although your research experience will not be as extensive, it must nevertheless be completed by you.

Funding

Generally, conducting research isn't free. As lab director, one of my responsibilities is identify, seek, and receive the funding that pays for much of the research we conduct. Competition for the research grants that the lab receives is fierce. For example, the National Science Foundation's National Robotics Initiative (NRI) funds around 10% of research proposals and annually receives proposals from many of the nation's top robotics researchers. Professors put in an enormous amount of work generating proposals. The second worst thing that can happen once a grant is received is nothing. The work of conducting the proposed research must be done. It is not acceptable to spend months "reading the manual." Funding organizations expect progress and that expectation places tremendous pressure on researchers. As a lab member, you play an integral role by making sure that the research is progressing.

The worst thing that can happen once a grant is received is academic dishonesty. It is better, by far, for a grant to generate no results than to fake results. As director, I would prefer to be in another profession rather than to falsify research results. False research results are not only bad for the lab, they're bad for the scientific community in general. It is never ok falsify research results. Not under any condition. Even if I, a collaborator, or senior member of the lab (such as postdoc) tells you to falsify research, your answer should be no. In the military soldiers have a duty to disobey unlawful orders. In this lab, falsifying data is an unlawful order.

Timely updates

Much of working in a lab (as with life) is about reputation. When you first join the lab as a student you have no reputation. Generating timely updates will help you successfully build your lab reputation. I require weekly updates on your progress. These updates should be submitted prior to our weekly meeting and should be in the form of a couple of PowerPoint slides summarizing what you accomplished during the prior week. Sending these slides satisfies my minimal expectation related to your progress. It shows me that you have at least done something (created the slides). It also gives us something tangible to talk about during the meeting. At the end of the semester I will put the slides together and we can review the progress you made during the semester. Not creating and sending the slides signals to me that you might not be serious about the research or that you might stalled in terms of progress.

Read emails thoroughly. Even the parts that were forwarded. Respond to all email requests within 24 hours during the work week, and 48 hours on the weekend, even if your response is simply an acknowledgement that you received the email.

Let the lab director know if you're planning on traveling or going out of town for any length of time.

Research Products

The research that we generate as a lab can and will result in a certain "products." These can be papers, posters, presentations, reports, data, videos, etc. which explain the experiments and knowledge that our work has generated. It will be important for all of us to generate the best possible research products. The quality of these products will be a direct reflection on the lab as a whole and can influence our reputation as researchers.

Commit to the Students
To quote Victor Hugo, “A doctor’s door should never be closed,…” My role as lab director is to provide guidance. As such I intend to help you succeed as a researcher. Support for students can take many different forms. Learning how to conduct research is one important form of support. Providing the materials to perform research is another form of support. Payments such as a stipend and tuition waiver is one final form of support. As lab director I will strive to ensure my end of the relationship.

Lab Space
Make the space your home. Claim a spot. If you are working on a funded contract you should spend the majority of your funded hours in the lab. The equipment should always stay in the lab, unless you have received permission from the director to remove the equipment. Communicate with your lab mates. They should become your friends and your support network.

Lab Roles and Hierarchy
Lab members will have specific additional roles that contribute to maintaining the lab. The following roles are currently detailed: webmaster, safety officer, and equipment maintenance. The webmaster maintains the lab web site. The safety officer will be responsible for managing the PSU safety requirements as they relate to the lab. The equipment maintenance person is in charge of noting any machines which are currently broken and, when appropriate, ordering parts for repair. Additional roles will be added in the future.

Most organizations operate as a hierarchy. For the most part, the lab’s hierarchy will be established by educational level and time in the lab. Exceptions will occasionally be made. Regardless of the hierarchy, all members of the lab should always be respectful of others.