Momentum Lab Handbook

Welcome to the Molecular Magnetic Resonance Imaging & Machine Intelligence (Momentum) lab! This document aims to discuss and coordinate our mentor-mentee expectations and relationship.

As your graduate studies/postdoc mentor, I will provide the mentorship and training to help you develop into an independent researcher. To accomplish this goal, it is essential that we establish effective communication and align expectations with each other. This document provides a framework for communicating the lab's culture and how you and I will work together to further your scientific productivity and intellectual development. I look forward to having open discussions about your and my expectations. Please note that this document is not a substitute for university rules and regulations and that those policies and any legal requirements supersede anything in this document.

Mission Statement
Our lab has the following long-term goals:
1. **Improve patient care** - have our developed methods implemented in at least one hospital and improve patient care for at least one person.
2. **Open new horizons** for molecular magnetic resonance imaging (MR) and biomedical machine intelligence in terms of accuracy, speed, and/or diagnostic ability.
3. **Mentor students/postdocs** to reach their academic/industry/independent career goals.
4. Spark curiosity and excellence in students through **teaching**.
5. Routinely and continuously **learn** while becoming active, **hands-on experts** in our field.
6. Retain and nurture an international and national **network** of collaborations.
7. Maintain **work-life balance** for all lab members.

What can you expect from me?
I will set the lab's scientific direction and provide the means to pursue it. This will include helping you find a research topic close to your heart, routinely meeting and discussing strategic scientific directions, and writing grants to fund the research.
I am committed to mentoring you now and in the future. I am committed to your training while in the lab and will gladly offer advice and support regarding future endeavors and career steps. I encourage you to attend international and national scientific meetings and will make an effort to fund these activities. These meetings are essential for showcasing your work and for networking opportunities as you pursue positions after your time in the lab ends.
I will be available for regular meetings to review and supervise the research. We will meet on a weekly basis (at least) and guide you through the research, data acquisition/experiments, data analysis, algorithm development, and paper/thesis preparation. While our routine interactions will focus on strategic moves and high-level algorithmic/experimental routes, we could dive into your code less frequently.
I will provide a safe and friendly working environment that is intellectually stimulating, supportive, safe, and free from harassment. I take seriously any difficulties you experience related to this statement. If there are conflicts with another lab member or anyone outside the lab, please inform me. I am open to suggestions on improving your experience in the lab.

What I expect of you

Commitment. Research is challenging. We're trying to make our two-cent contribution to human knowledge by trying something new, developing a novel method, or exploring a new hypothesis. There will be moments of success and thrill but many moments of despair and difficulty. We will strategically have plan Bs and Cs in case of surprises and (somewhat expected) failures, enabling us to move forward. But remembering the ultimate goal (making life better for someone else) helps getting up after a receiving knockout.

Scientific output: the general output expected from an MSc student is at least a single (first author) international journal paper and a single abstract presented at an international conference. For a PhD student, we aim for at least 3 (first author) journal papers and around three international conference presentations (ideally one annually). The numbers can vary if we aim for very competitive journals. For PhD students, having three papers as first author typically enables submitting a "papers thesis," which is less demanding and is reviewed by fewer international reviewers, with typically fewer comments for corrections. The expected MSc duration in the lab is two years; for a PhD, we aim for 4-5 years.

Integrity: Everything we publish is under our full responsibility. We must triple-check that it is reproducible and sound. Any Plagiarism is, of course, not allowed (including self-plagiarism). It's better to publish zero papers and make small progress that we're sure of than publish a false claim that would move the field backward.

Initiatives: Your research project is a 'sandbox opportunity' to improve your independence and generate new initiatives. You are encouraged to come up with new ideas. Your mentor's role is to help set priorities and ensure you are on the right track and pace to finalize your project on time. Notably, the level of expected independence is proportional to your career stage (MSc/PhD/Postdoc).

Working hours: please work whenever suits you best. I do not care nor monitor when people come and go. The only thing we'll monitor is the project's progress. Namely, in our weekly meeting, we'll set goals (jointly) for next week and start the next meeting by looking at the summary you made last week. The only mandatory face-to-face meetings will be our (1) weekly personal meetings, (2) the lab weekly group meeting, and (3) bi-weekly journal club. In that sense, graduate and postdoc studies are challenging, requiring many hours of debugging, starting at the wall while contemplating new ideas, and wet lab experiments. While it's sometimes tempting to work around the clock, please have enough time for family, friends, and anything else that makes you happy. If you succeed in well-balancing it all, please teach me how.

Non-disclosure: We strive to make our findings open access and, in some specific cases, consider licensing and commercializing them. You must not share, email, or publicly present your work or lab-related work, documents, and data without consulting me. Your source code should be stored in a private GIT repository during the research period. Whether to release it as open source or license it will typically be decided at the paper publication stage.

Data protection: Our lab works with human medical data. Despite these data being anonymized, it is forbidden to share them with anyone outside the laboratory or keep a copy on a private (outside the university) computer. These data should be solely stored on the faculty servers and accessed and processed via a secured connection to the lab servers.

Collaborative spirit: While you will lead your research project, you are encouraged to participate and help other lab members (typically, this will not require more than 15-20% of your time). Paper authorship will be determined by the standard guidelines set in https://doi.org/10.1073/pnas.1715374115.

Dept. of Biomedical Engineering, Sagol School of Neuroscience, Tel Aviv University, Tel Aviv 6997801, Israel
Multidiscip. Research Building, Room 410 | +972-36409418 | https://mri-ai.github.io | orperlman@tauex.tau.ac.il

Essential check-list items at the end of your studies:
(1) Leave 2-3 months for thesis preparation and revision.
(2) Submit any remaining papers. Paper revisions (corrections after receiving the peer review comments) should be completed before the thesis test. If not, you are expected to be available for corrections and revisions after completing your studies.
(3) Arrange all the data and code used in a very organized folder on your lab desktop, with accompanying documentation (at least a very clear README file). This will allow future generations (minimally at the lab) to build on your work and ensure your contribution to science is maximized and continued.

Appendix - Lab routine guidelines
1. **Working parallel to research**: ideally dedicating 100% of your time to research is ideal and recommended. Our rule of thumb is to allow a single day (<=10 hours) of work outside the university. This also allows for receiving the scholarship. Working as a TA in TAU may also be possible.
2. **Literature review**: this is a critical step in the project's (and scientist's) life. We typically invest a few weeks at the beginning of the research to dive into existing and recent related work. But you should continuously check on new papers at least once a month. The journal club is a good starting point.
3. **Data and code backup** - please make sure you always have at least three backups for your data. Ideally, they should be of different types and in different physical locations. E.g., an external hard drive, a cloud backup, and a desktop/laptop computer other than the one you're routinely using and not all placed in your lab/home (the only exception is human data, which should only be stored in the university). I've heard devastating stories from friends who got their thesis erased after years of work, their hard drives stolen/lost, or hackers trying to encrypt it for ransom. Use GIT for version tracking.
4. **Lab notebook** - any wet experiment you perform (phantom preparation, preclinical or clinical imaging) must be well documented in the physical (green) lab notebook and in our shared electronic notebook (LabArchives).
5. **Chemical work** – an MSDS folder exists in the glass cabin of the chemical room on floor 4 of the Multidiscip. Building.
6. A private lab **GitHub** repository with our typical routines will be available for you.
7. **IT security** – never contact any of our computers/servers from outside the firewall without a VPN. Software like AnyDesk and TeamViewer are not allowed due to data safety. Being that said, you may access your computer following VPN using SSH or remotely to an IDE of your choice - pycharm ("remote-development"), vscode ("remote explorer"), etc.
8. **Writing in English** is essential and will be instrumental for your paper and thesis writing. Please sign up for the university's Principles of Academic/Scientific Writing in English course as early as possible.

We are committed to providing a professional, friendly, safe and welcoming environment for all lab members, regardless of gender, sexual orientation, disability, race, ethnicity, religion, national origin or other protected class.

References: 1. Masters, Kristyn S., and Pamela K. Kreeger. *PLoS Computational Biology* 13.9 (2017): e1005709.
2. Compact Between Biomedical Graduate Students and Their Research Advisors. Association of American Medical Colleges; 2017.
3. Compact Between Postdoctoral Appointees and Their Mentors. Association of American Medical Colleges; 2017.
4. https://www.aimlab-technion.com/ethics
5. Noam Ben Eliezer's lab ethics.

Dept. of Biomedical Engineering, Sagol School of Neuroscience, Tel Aviv University, Tel Aviv 6997801, Israel
Multidiscip. Research Building, Room 410 | +972-36409418 | https://mri-ai.github.io | orperlman@tauex.tau.ac.il