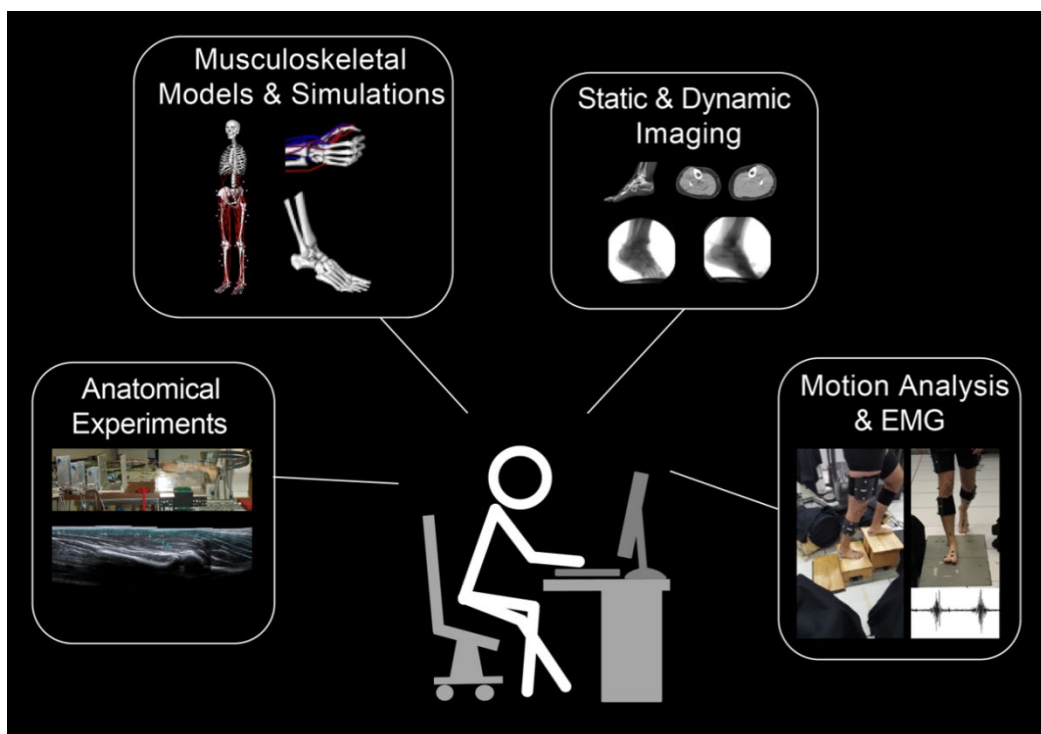


LAB GUIDEBOOK

Musculoskeletal Biomechanics Lab

*Building Informative Open-source Models, Examining Complex Human Activities,
& Navigating Interpretation of Computer Simulations*



By: Jennifer A. Nichols, Ph.D.

Last Updated: 7/1/19

The goal of this guidebook is to document the ideas, values, and policies that guide the Musculoskeletal Biomechanics Lab (MBL). This guidebook is a living document meaning that it will evolve and be edited over time. If you have suggestions to improve the guidebook, please communicate those suggestions to Dr. Nichols.

The contents of this guidebook were influenced by similar work by Dr. B.J. Fregly and Dr. Miriam Aly.

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THE LAB

The **Musculoskeletal Biomechanics Lab** at the University of Florida is a group of individuals who share the following vision, mission, and values.

VISION

To create predictive, biomechanical models to improve the functional ability and quality of life of individuals with musculoskeletal disorders.

MISSION

- To achieve **research excellence** as a lab and as individual researchers.
 - To teach and train undergraduate and graduate students.
 - To solve challenging and meaningful biomechanics problems.
 - To disseminate research findings across disciplines both nationally and internationally.
- To be **biomechanics experts** in the areas of musculoskeletal modeling, predictive simulation, and analysis of human movement.
 - To continuously learn technical and professional skills.
 - To engage with scientists and non-scientists.
 - To support biomechanics education and outreach.

CORE VALUES

- **Integrity** – Be honest, ethical, and trustworthy. Adhere to the professional standards and ethical principles that guide research practice.
- **Respect** – Respect yourself, your colleagues, and the lab. Value each person's opinions, viewpoints, personality, and skills. Care for the equipment and people in the lab, department, college, and university.
- **Inclusivity** – Value and include individuals with different backgrounds, experiences, perspectives, and viewpoints. Realize our differences can be used to create and support a stronger, more innovative team.
- **Engagement** – Share our research and knowledge with the scientific community and the public. Support outreach and educational efforts.

LAB DIRECTOR: JENNIFER A. NICHOLS, PH.D.

The Musculoskeletal Biomechanics Lab is led by Dr. Jennifer A. Nichols, an Assistant Professor at the University of Florida (UF). Dr. Nichols grew up in Unionville, a classic New England suburb in central Connecticut. For her undergraduate training, she went to Tufts University in Medford, MA, where she received a B.S. in Mechanical Engineering in 2008. For graduate school, she attended Northwestern University in Evanston, IL. She received an M.S. in Biomedical Engineering in 2011, an M.A. in Medical Humanities & Bioethics in 2014, and a Ph.D. in Biomedical Engineering in 2014. Prior to joining UF in December 2017, she completed a postdoctoral fellowship in the Department of Orthopaedics at the University of Utah. Her interests include biomechanics, musculoskeletal modeling, complex joint systems such as the foot/ankle and wrist/hand, predictive surgical simulations, medical imaging, and research ethics. Outside of work she enjoys swimming, reading, traveling, and eating ice cream. She is married to Dr. Joel B. Harley, an Assistant Professor in Electrical & Computer Engineering at UF.

An Important Note on Titles:

Dr. Nichols goes by different titles in different settings. In her lab, all of her students are encouraged to call her Jen. Being on a first-name basis in the lab signifies that faculty and students are research colleagues. We work together. We publish together. We succeed (and fail) together. In the classroom setting, she prefers to be called Professor Nichols, but is often referred to as Dr. Nichols. Her preference comes from years of working with orthopaedic surgeons, where anyone called "doctor" is expected to have medical training. The use of professional titles in the classroom acts to reinforce the power differential between faculty and students.

LOCATION: NEB 510, NEB 513, & NEB 355

The Musculoskeletal Biomechanics Laboratory is comprised of three spaces in the New Engineering Building (1064 Center Drive):

- **NEB 510** is the experimental lab, which includes a 12-camera motion capture system, electromyography (EMG), ultrasound, and torque-testing equipment.
- **NEB 513** is the student office, which includes 8 student workstations and a small meeting area.
- **NEB 355** is the Dr. Nichols' faculty office.

RESEARCH EXCELLENCE

EXPECTATIONS & MINDSET

I (Jen) expect **students** in the Musculoskeletal Biomechanics Lab to

- Embrace challenging problems. Strive to become the best problem-solver you can be.
- Remember that research is hard. You are trying to discover new knowledge that has never been discovered before.
- Ask questions. Your lab mates and your advisor are great resources!
- Answer questions. Mentor and teach your lab mates and your advisor. You have unique knowledge and opinions that they value!
- Attend weekly lab meetings. This is our opportunity to learn together, share our successes, and learn from our failures.
- Communicate. Remember that no one can read your mind. You are allowed to share the stresses and joys affecting your life, whether they are related to life in or outside of the lab. You also have the right to say no, if you are asked to do something that you do not want to do.
- Report problems.
 - Technical problems, such as malfunctioning equipment, should be reported to Jen.
 - Scientific problems, such as mistakes in your code or errors with your results, should be reported to Jen and relevant collaborators. We all find errors in our work. The key to being a good researcher is to communicate those errors, correct them appropriately, and learn from them so that we can avoid similar errors in the future.
 - Personnel problems, such as feelings of hostility, tension, harassment or discrimination, need to be addressed immediately. No one can thrive in an unhappy work environment and disrespectful behavior will not be tolerated. Please report these issues to Jen. If the issue is with Jen, and you feel comfortable telling her, please do so. If you do not feel comfortable doing so, you can tell any other faculty member in the BME department.

In return, as a **Lab Director, advisor, and mentor**, I promise to

- Support your research and career goals. This includes writing recommendations, introducing you to people in my professional network, and giving you feedback on application materials (resumes, C.V.s, cover letters, e-mails etc.). Keep in mind the more time you give me to review materials, the higher the quality of my feedback. You should ask for recommendations at least two weeks prior to a deadline.
- Be available to meet in-person or talk electronically (slack, skype/zoom, e-mail). We will regularly discuss your research. But we can also discuss anything else you want.
- Provide timely feedback on written documents. You have the right to remind me (as frequently as you see fit) to read and revise your work.
- Encourage you to disseminate your work through local presentations, conference talks (when finances permit), and journal articles. I will also promote your work through presentations I give.
- Write grants and handle lab finances. As a student, you should not have to worry about whether there is adequate money for your research supplies. Ph.D. students should not have to worry about their tuition and stipends during any portion of their graduate studies.
- Share my perspective on where the lab is going and how our research is evolving. I am also happy to share copies of our funded and unfunded grants, as long as you promise to keep them confidential. Similarly, I am happy to share copies of presentations and posters. Just ask!

HOURS, LOCATION, & WORK ETHIC

As a researcher, you will be judged not by the total number of hours spent in the lab, but rather the quality of the results that you generate. With that in mind, here are some general guidelines regarding research work:

- Working in lab provides the opportunity to learn from and with your lab mates. It also builds a sense of community and gives you easy access to resources on campus. Therefore, you are strongly encouraged to spend most of your research time working in lab.
- When and where you work is your choice. You are expected to be physically present at scheduled meetings and experiments. But outside of those obligations, you can work whenever and wherever you choose.

- When choosing when and where to work, please keep your personal safety in mind. For example, working on campus, alone, in the middle of the night, may not be the best idea.
- **Undergraduate students** are recommended to dedicate approximately 10 hours per week to research. This is the quantity of time that it takes most undergraduate student to make steady and regular progress. However, remember that research should not prevent you from passing your classes and graduating.
- **M.S. students** are encouraged to align their research time with the type of project they are completing. For example, M.S. student completing a thesis may adopt a schedule similar to a Ph.D. student, while a non-thesis student may approach research like a course.
- **Ph.D. students** are encouraged to think of their research training like a job. Find a work-life balance that works for you. But realize, the expectation (according to the UF Student Union contract) is that you work 40 hours per week. This includes coursework and research. Many students choose to work more than this. Adopt the schedule that allows you to be productive and make steady, meaningful progress.
- Seek advice if you need help achieving work life balance. It can be challenging to balance research with your other personal and professional activities. You should also talk to Jen if your research activities are negatively affecting your coursework, mental health, or general well-being. Self-care should always be your first priority!
- You are not expected to nor required to work outside of regular business hours, on weekends, or during holidays. If you receive communication from Jen or a lab mate outside of regular business hours, you are allowed to ignore that communication until the next time you are in lab. If there are due dates outside of regular business hours (yes, conference abstracts are sometimes due on weekends), you are encouraged to work with Jen to ensure that you have a plan for completing and submitting your work in a manner that works for both of you.

VACATION, SICK DAYS, & LEAVE

Vacations are important to provide mental breaks and give you a chance to re-charge. The following are guidelines for vacations:

Everyone: There are 10 days each year that UF designates as holidays (see HR website for list). You are not expected to work on these holidays. Additionally, during the time between Christmas and New Year's (Dec. 26 – Jan 1), UF encourages only essential personnel to be on campus. You are not expected to work on these days. I recognize that some of these days off correspond to religious holidays of the Christian faith or are American cultural holidays. If you follow the practices of another religion or want to take off specific days to practice the traditions of your culture, you are free to do so.

Undergraduate & M.S. Students: Given that your primary responsibility is to take classes, you are generally expected to follow the vacation schedule provided by the academic calendar. This means that you are not expected to work during breaks between or during semesters. However, if you would like to work during these times, you may choose to do so.

Ph.D. Students: To my knowledge, there are no explicit UF policies regarding vacation for graduate students. In general, you are expected to treat graduate school as a job. Keep in mind that the best research progress often happens during summer or semester breaks when schedules are free of classes. However, you are entitled to vacation. I ask that you tell me when you plan to take vacation, record any days you will not be in lab (there's a spot for this on each semester's scheduling spreadsheet), and track the total number of vacation days you take each academic year (Sept. – Aug.). This record will allow open communication about vacation time and needs. Keep in mind that if you schedule your vacation over a conference deadline, you may not be able to submit to that conference. It is better we have those conversations upfront, before you purchase plane tickets or make firm plans with family or friends.

Lab Director: I travel for both personal and professional reasons. I will communicate with you regarding how my travel is expected to impact the lab. This means that there will be times that I am unavailable because I am on vacation (yes, I take breaks too!). However, if I am traveling for professional reasons, I will often be available or at least have limited availability to answer questions. Note, I am always available for emergencies (my cell phone number is on the wall in NEB 510 & 513).

Sick days are defined as days that you do not work because you are sick. If you are sick, you should not come to lab. This will allow you to rest and get

better faster. This will also protect your lab mates from getting sick. When you are absent from lab due to illness, please let Jen know.

Leave is defined as an extended period of time that you need to be away from the lab. The two most common types of leave are family leave and medical leave. In the United States, access to leave is protected by the Family & Medical Leave Act (FMLA). This gives workers the right to take leave to have a child or take care of an elderly relative. How FMLA applies (or does not apply) to students is frequently changing, and universities often adopt their own policies regarding student leave to account for issues with tuition or coursework. Leave also frequently involves changes in how (or if) you are getting paid as well as how your benefits (health insurance) work. If you have a reason that you need to take leave, please communicate with Jen. She will work with you to make sure that any required paperwork is completed and that you understand the University's current official leave policies.

STIPENDS & COMPENSATION

Course Credit: All **B.S. and M.S. students** must be registered for the undergraduate (EGN4912) or graduate (EGN6913) research course. This will provide documentation on the student's transcript that he or she completed supervised research. Note, that you can register for 0 credits to avoid paying additional tuition and fees. However, there is a 1-credit tuition charge for 0-credit registration if you are not enrolled in any other courses. Students may choose to register up to 3 credits. Students interested in registering for 1-3 credits should talk to Jen about how that affects the research expectations for the semester. In general, registering for >0 credits will require completion of a deliverable (i.e., something that is turned in and graded).

Stipend: All **Ph.D. students** are paid a 12-month stipend through grants (obtained by Jen), fellowships/scholarships provided by the University, and/or fellowships from external agencies (obtained by the student). The stipend and benefits (e.g., health insurance) will be provided in accordance to University policies, which are designed to abide by the collective bargaining agreement between UF and UF Graduate Assistants United, the graduate student union.

Pay & Compensation: During Fall and Spring semesters, all **undergraduate and M.S. students** are unpaid. The only exception to this is students who are receiving money through a research scholarship, such as the University Scholars program. Over the summer, if finances permit, Jen will offer

compensation to **undergraduate students** who have spent at least one full semester in the lab because she realizes that students performing research during this time are often foregoing jobs or internships that would provide financial support. Summer undergraduate students are often compensated through an hourly wage. All compensation is provided in accordance to University policies, meaning students will have to complete paperwork and/or training to receive pay. The rules surrounding summer compensation for **M.S. students** are complicated and can change year-to-year based on the UF Graduate Student Union's Collective Bargaining Agreement. As a result, M.S. students are strongly encouraged to use their summer to pursue internships and other career building opportunities outside the lab. However, if an M.S. student is interested in staying in the lab through summer and potentially receiving compensation, he or she should talk to Jen in March, well in advance of summer, to understand what options (if any) exist.

DISSEMINATION & AUTHORSHIP

Dissemination is the act of sharing your research. Most often this is accomplished through publication or presentation. For example, you can publish conference abstracts, conference papers, or journal articles (often called manuscripts). You can also present your work as a poster or a podium presentation at local, national, or international events.

I encourage everyone in the lab to work toward dissemination goals that are aligned with their career interests. For example, an undergraduate student who is interested in graduate school, should try to present their work at BMES because this conference is a great opportunity to learn about biomedical engineering graduate school programs throughout the nation. Similarly, graduate students should strive to publish papers regularly throughout their M.S. and Ph.D. training because this demonstrates that they have made an independent contribution to scientific knowledge, will help them graduate, and will aid them in getting jobs in industry or academia.

Authorship: Being an author on an abstract or manuscript is a big deal! In our lab, we follow the [ICJME guidelines for defining authorship](#). An important part of these guidelines is that all authors "substantially contributed" and agree to be "accountable for all aspects of the work." We will discuss authorship during the early planning stages of any writing project, throughout the process, and immediately prior to submission. If you feel that you contributed to a project and deserve authorship, you should tell Jen and the lead author of that

project. The lead author (listed first) is the person primarily responsible for the project. This person typically completes the majority of the writing. The senior author (listed last) is the primary mentor on the project and will typically be Jen. Jen will also typically serve as corresponding author. The corresponding author provides contact information and takes responsibility for being available to answer any future questions about the manuscript. Middle authors (listed between first and last) are listed in order of contribution to the project, meaning the second author will have contributed more than the third author, the third author will have contributed more than the fourth author, and so on. It should be noted that some journals provide an opportunity to designate co-first authors to identify that two (or more) people contributed equally to the generation of the project. Ph.D. students are expected to submit and/or publish three or more first author papers prior to graduation. Note, at the time of your graduation, we will discuss any unfinished publications. Depending on a variety of factors, we may decide that you should complete the work as first author, I should complete the work as first author, or another student in the lab should complete the work as first author.

Conferences: Submitting an abstract to a conference is an informal contract in which you agree to attend the conference and represent the lab, and I agree to fund your travel to the conference. To assist with funding travel, I may request that you submit internal or external travel award applications. If you are asked to submit one of these applications, you are expected to do so. Receiving these additional funds frees up money so that more students can benefit from conference travel. In general, **undergraduate students** will be encouraged to attend the Biomedical Engineering Society (BMES) Annual Meeting or the American Society of Biomechanics (ASB) Annual Meeting. Both of these conferences are very student friendly. **Graduate students** are encouraged to identify conferences that are aligned with their research and that will provide good networking opportunities. Potential conferences include BMES, ASB, International Society of Biomechanics (ISB), World Congress of Biomechanics (WCB), IEEE Engineering in Medicine & Biology conference (EMBC), Gait & Clinical Movement Society (GCMAS), Summer Bioengineering, Biomechanics and Biotransport conference (SB3C), International Society of Electromyography & Kinesiology (ISEK), Computer Methods in Biomechanics and Biomedical Engineering (CMBBE), Foot & Ankle International (FAI), and Hand & Wrist Biomechanics International (HWBI). **All students** are encouraged to identify the conferences that they are most interested in attending. Every conference will have a website describing the conference and providing information regarding deadlines for submitting abstracts and/or conference

papers. Students are encouraged to identify conferences that are not listed but align with their interests. For example, students may be interested in attending conferences hosted by the Society of Women Engineering (SWE), the Society for Advancing Chicanos/Hispanics and Native Americans in Science (SACNAS), the Society for Hispanic Professional Engineers (SHPE), the National Society of Black Engineering (NSBE), or others. Talk to Jen about your scientific and professional interests.

Journals: Not all journals are equivalent. In recent years, there has been a rise in predatory journals, which charge authors to publish without providing the editorial and indexing services necessary for those publications to be appropriately recognized. In general, if a journal is searchable via PubMed, it is likely (but not guaranteed) to be a reputable, indexed journal. Other ways to judge the quality of a journal is to evaluate its impact factor, members of the editorial board, association with a national or international society, or authors. Remember there is good science in bad journals and bad science in good journals. A sample of biomechanics journals that we publish in include *Journal of Biomechanics*, *Clinical Biomechanics*, *Gait & Posture*, *Annals of Biomedical Engineering*, *PLoS One*, *Journal of Electromyography & Kinesiology*, and *IEEE Transactions on Biomedical Engineering*. The **first author of a manuscript** will be responsible for identifying a list of potential journals for a given publication. Each journal has specific formatting requirement and page (or word) limits that should be considered early in the writing process. **All lab members** are also encouraged to identify a method for reading the literature that works for them. Options include subscribing to table of contents announcements for specific journals, following journals on Twitter, regularly browsing the literature through Pubmed or Google Scholar, participating in journal clubs, or systematically incorporating reading into your research life (e.g., aim to read at least 1 new article a week).

FELLOWSHIPS & AWARDS

Fellowships and awards are a great way to gain recognition for your work. They also look good on your resume and/or C.V. No fellowship or award is too small or too big to pursue. You can only win awards and fellowships if you apply! All students are encouraged to identify fellowships and awards that they are interested in pursuing. Talk to Jen to help identify the best opportunities for your specific circumstances and career stage. A partial list of opportunities is included below. If there are additional opportunities that you think should

be added, let Jen know, so that other students can benefit from the opportunities you have identified.

Undergraduate Fellowships & Awards

- University of Florida Emerging Scholars
<https://cur.aa.ufl.edu/scholarships/>
- University of Florida University Scholars
<https://cur.aa.ufl.edu/scholarships/>
- Society of Women Engineers (SWE)
<http://societyofwomenengineers.swe.org/scholarships>
- De Luca Foundation Research Scholarship
<https://www.delucafoundation.org/activities/support-researchers/research-scholarships/>

Graduate Fellowships & Awards

- National Science Foundation Graduate Research Fellowship Program (NSF GRFP) <https://www.nsfgrfp.org/>
- Ruth L. Kirschstein Predoctoral Individual National Research Service Award (NIH NRSA F31) <https://researchtraining.nih.gov/programs/fellowships>
- Hertz Graduate Fellowship Award <http://hertzfoundation.org/fellowships/fellowshipaward>
- National Defense Science & Engineering Graduate Fellowship (NDSEG) <https://ndseg.asee.org/>
- De Luca Foundation Research Scholarship
<https://www.delucafoundation.org/activities/support-researchers/research-scholarships/>
- Many societies offer student awards for various career stages:
 - Society of Women Engineers (SWE)
<http://societyofwomenengineers.swe.org/scholarships>
 - American Society of Biomechanics (ASB) Young Scientist Pre-Doctoral Award <http://www.asbweb.org/awards-and-grants/>
 - BMES Career Development Award
<https://www.bmes.org/awards>

- International Society of Biomechanics (ISB) International Travel Grant Program <https://isbweb.org/students/student-grants>
- ISB Matching Dissertation Grant Program <https://isbweb.org/students/student-grants>
- ISB David Winter Young Investigator Award <https://isbweb.org/activities/awards-and-honours/david-winter-young-investigator>
- ISB Carlo de Luca Emerging Scientist Award <https://isbweb.org/activities/awards-and-honours/emerging-scientist-award>

Travel Awards

- University of Florida Student Travel Awards <http://graduateschool.ufl.edu/prospective-students/funding/travel/>
- Many societies offer travel grants to their conferences:
 - American Society of Biomechanics Student Travel Awards <http://www.asbweb.org/awards-and-grants/>
 - International Society of Biomechanics (ISB) Congress Travel Grant Program <https://isbweb.org/students/student-grants>
 - ISB Technical Group Meeting Travel Grant Program <https://isbweb.org/students/student-grants>
 - BMES Student Travel Awards <https://www.bmes.org/content.asp?contentid=178>

OPEN-SOURCE & DATA SHARING

Open-science refers to the movement to make scientific research and data accessible to all. The Musculoskeletal Biomechanics Lab supports open-science. However, we also recognize that we have a responsibility to ourselves, our colleagues, and our profession to pursue open-science in a thoughtful and ethical manner. In particular, we need to get credit for our work through publication or other means before it is widely shared. All requests for **published or unpublished** data, models, simulations, or research product should be discussed with Jen.

Sharing Models & Simulations: We share models and simulations via our website and SimTK.org, which currently hosts the largest OpenSim model repository. In order to ensure our lab is appropriately acknowledged, models and simulations should only be shared after publication of the work in which they were used. This allows other researchers to build off our work and cite our original publication when doing so. You should never publish, post, or share a model or simulation without Jen's permission. Prior to sharing, all model and simulations files must be well-commented and free of errors. A method should also be in place to ensure that the files will be appropriately updated as software evolves and changes. Jen will work with you to make sure anything posted is up to the lab's standards.

Sharing Publications: We share our publications via our website, Twitter, ResearchGate, and NIH Public Access on PubMed. However, when doing so, we should work to abide by the appropriate copyright laws. For example, when you publish, you typically relinquish your copyright to the journal. Many journals then require a 12-month embargo before you can share your research via NIH Public Access and/or restrict the version of the article you are allowed to share on social networking sites such as Twitter or ResearchGate. This enables the journal to make the profit it needs to continue publishing research. There are many problems with this publishing model. However, under this model, publishing is typically free. In contrast, many open-access publishing options (e.g., PLOS One) are currently expensive; it can cost several thousand dollars to publish an open-access manuscript. The landscape of academic publishing is rapidly changing and we will adapt as it changes. As a lab, we will work to publish in whatever manner allows us to be appropriately recognized for our work while also sharing our work as broadly as possible. If you have questions regarding how to appropriately share your publications, talk to Jen.

Sharing Data: Sharing raw data is complicated and requires many considerations. For example, sharing human subject data involves de-identifying the data and verifying that we have permission (via the consent form and IRB) to share the data. All requests for raw data will be discussed and handled on a case by case basis. If you are interested in sharing raw data as part of a manuscript as supplementary data or with a simulation, talk to Jen to make sure you are doing so appropriately. Remember that the raw data of the lab is one of our most valuable commodities, so we need to protect it and only share it when it is most appropriate to do so.

Receiving Requests to Share Research: Occasionally, students receive requests (via e-mail or in person at a conference) from other researchers interested in having access to their research. If you receive a request, you should talk to Jen before you respond and include Jen on any e-mailed response. If the request occurs in person at a conference, it is appropriate to tell the individual that you need to talk to your advisor regarding what can be shared at this time. You could also introduce the person to Jen, if she is also at the conference. When handled appropriately, these requests can lead to future collaborations and positively expand your professional network. When handled inappropriately, your research could be plagiarized or stolen. It is important that you recognize the risks of sharing and take steps to protect both your professional reputation and the professional reputation of the lab.

Sending Requests to Access Research: Jen works hard to maintain and grow the professional network of the lab. You can help this effort by ensuring all of your communication with colleagues and potential collaborators are professional and well-written. If you identify data or research that you would like access to, you should talk to Jen about how to approach the corresponding author of the research. In some cases, Jen will already know the author and can facilitate an introduction and access. In other cases, Jen will be able to ensure your e-mail is written in a manner most likely to garner a response. You should include Jen on any e-mail where you request information from another lab. This will allow her to follow-up appropriately.

PROTECTION OF HUMAN SUBJECTS

Institutional Review Boards (IRB) were established to review research protocols to ensure the rights and welfare of human subjects are protected. All lab members are expected to understand and abide by the rules and regulations of the University of Florida IRB as well as the federal laws on protecting research subjects. The ability to gather data from human subjects is essential for our research success. However, it is also a privilege that can be taken away. Failure to strictly adhere to the regulations protecting human subjects can have serious consequences, such as the lab losing its ability to work with human subjects and/or members of the lab being fined or going to federal prison. If you have questions about how to work with human subjects ask! A few key points regarding human subject research are highlighted below:

IRB Approval & Training: All lab members who are actively performing an experiment on human subjects or analyzing identifiable data from human

subjects will be required to complete the IRB's required training and be added to an active IRB protocol. When you are added to an IRB protocol, you are expected to review the protocol and read the consent form. If you have questions about any aspect of the approved study, you should ask Jen and/or the lead researcher conducting the study. **Graduate students** are expected to take an active role in writing the IRB protocol and consent forms for any experiment they are conducting. **Undergraduate students** who are interested in learning more about the IRB process should talk to Jen about whether there are protocols they can get involved in writing.

Informed Consent: Informed consent is a discussion in which a researcher explains to a research subject the purpose of the research study, the procedures involved, risks, benefits, and alternatives to participating. The research subject can choose to consent or not consent. Informed consent is documented by both the researcher and the research subject signing the informed consent form. Lab members must be authorized to obtain informed consent and this authorization must be documented on the IRB protocol. Jen will meet with anyone obtaining consent to discuss specific aspects of the consent process based on the research study.

HIPAA & Confidentiality: A key component of protecting research subjects is maintaining confidentiality. This means that whenever possible data should be de-identified (i.e., all 18 HIPAA identifiers should be removed). This also means that when discussing research subjects in the lab, you should discuss them using their subject ID, not their name. This is true even if your research subject is a fellow lab mate! Everyone deserves to have their identify protected. Additionally, when sharing research photos, you should remove identifying features (in accordance to the IRB protocol).

Adverse Event Reporting: All adverse events are required to be reported to Jen and the IRB. Events should be reported immediately, no exceptions. Jen's cell phone number is posted on the wall for a reason.

Lab Members as Research Subjects: Many students enjoy participating as research subjects. However, you should never feel pressured to participate in a research study just because you are in the lab. To minimize peer pressure, the lab has adopted an "opt in" approach to using lab members as research subjects. This means that new studies (or pilot studies) for which lab members are eligible to participate will be announced in lab meeting. All relevant information regarding the study will be shared and members of the lab will be

given the opportunity to ask questions. It will then be the responsibility of individual lab members to “opt in” by contacting the lead researcher of the study outside of lab meeting to express interest in participating. You are never required to participate in a research study. Participating is always voluntary. If you ever feel pressured to participate in a research study that you do not want to participate in, please tell Jen so she can address the issue.

LAB SAFETY

The safety and welfare of all lab members is important. **All lab members** are expected to complete required safety trainings and report safety violations to Jen. All injuries that occur in the student office or lab (even minor cuts requiring no more than a band-aid) are required to be reported to Jen.

There is a **first aid kit** in the lab. It is located in the cabinet directly above the sink. Good laboratory safety practice dictates that anyone regularly working in lab should familiarize themselves with the location and contents of the first aid kit. This means open the kit and see what is in it! Any time that items from the first aid kit are used to treat a lab-related injury (in student office or lab), you are required to report the incident to Jen. Report everything, as it is Jen’s responsibility to determine what does or does not need to be reported to the department, college, and university.

Based on the activities in our lab, everyone should wear closed-toed shoes when working in the lab. You are also encouraged to utilize common sense when it comes to safety regarding various hand tools and the ladder that are in our lab. Please utilize the buddy system when using the ladder and remember best practices when using a ladder (i.e., move the ladder instead of reaching; make sure the ladder is fully open and on flat ground, etc.).

You should also familiarize yourself with fire exits in the building. In the event of an emergency, you are expected to evacuate and follow the directions of emergency personnel. **Emergency contact numbers** are posted on the wall in the student office (by the door) and the lab (near the phone). Read those numbers and consider programming relevant numbers into your phone so they are available in an emergency.

Environmental Health & Safety will inspect the lab annually, and has the authority to shut down the lab if it is unsafe. Our goal is to maintain a lab free of safety violations. However, accidents can still happen at any time. The

greatest asset in maintaining a safe lab is your care, caution, and common sense while working. If you have any suggestions for making the lab a safer work environment, let Jen know.

LAB CULTURE

RESPECT & INCLUSIVITY

All lab members are expected to treat all members of the lab, university, scientific community, and public with respect. We recognize that everyone has different backgrounds, beliefs, and experiences. We strive to use our differences to strengthen our science and improve our discourse.

All students, faculty, research subjects, and visitors should feel welcome in the lab regardless of their sex, age, disability status, race, ethnicity, national origin, sexual orientation, gender identity or gender expression, marital status, religious beliefs, military status, or political affiliations. Any form of harassment or discrimination will not be tolerated.

If you are affected by or witness harassment and/or discrimination in the lab, please let Jen know so the problem can be immediately addressed. When talking to Jen, you should be aware that she is a mandatory reporter under Title IX. This means that conversations reporting specific instances of harassment and/or discrimination with Jen are not confidential. If you need to have a confidential conversation, Jen can help you identify campus resources where those conversations can take place.

SCIENTIFIC INTEGRITY

Scientific integrity is the foundation of good research. All lab members are expected to conduct research that is repeatable, reproducible, and free from errors. Scientific misconduct, including plagiarism, fabrication, falsification, or any other form of lying about your research methods or research results will not be tolerated. If you witness or suspect scientific misconduct, please let Jen know immediately. Working together to maintain the integrity of our research is important to the success of each lab member and the lab as a whole.

Scientific integrity also requires that you acknowledge and correct your mistakes. We all find errors in our work. The key to being a good researcher is to communicate those errors, correct them appropriately, and learn from them so that we can avoid similar errors in the future. Scientific mistakes, such as errors with your results or issues in your code, should be reported to Jen and relevant collaborators. Jen will help you identify the appropriate methods to correct the mistakes and what actions you and the lab need to take to prevent similar mistakes in the future.

SLACK WORKSPACE

All lab communication is conducted through the **Musculoskeletal Biomechanics Lab Slack Workspace** (<https://mbl-lab.slack.com/>). This workspace serves as a hub of lab communication and is an important part of our lab community. As such, please be respectful and kind in all Slack posts.

All lab members are allowed to join, contribute, or start any Slack channel. You do not need Jen's permission to post. Engage with your lab mates in the public channels as well as through private direct messages to get the most out of the lab community. Note that direct messages are truly private messages; Jen cannot see the content of direct messages that are not addressed to her.

Suggestions on how to improve the Slack workspace or discussion of issues with the current use of the workspace are encouraged.

SOCIAL ACTIVITIES

To build a sense of community, members of the lab are encouraged to plan and participate in social activities. Participation in all social activities is voluntary. You are not required to participate. However, when choosing whether or not to participate, remember that it can be rewarding to get to know your lab mates and advisor outside of the typical professional setting.

Jen strives to plan and host two to three social activities each year. If you have suggestions for specific activities, please let her know.

OUTREACH

ACTIVE CITIZENSHIP

Active citizenship means being involved in the local community. For the Musculoskeletal Biomechanics Lab, this means being involved in department, college, and university events. It also means being involved in local and national outreach events. Research leads to new knowledge. But that knowledge is only valuable if it is shared! **All lab members** are encouraged to find ways to be active citizens. Share your biomechanics knowledge with a friend or family member! Talk to a peer researcher about why studying human movement is important! Engage a child in a discussion about why being an engineer is awesome! Find ways to be involved in sharing your passion for biomechanics with both scientists and non-scientists!

NATIONAL BIOMECHANICS DAY

National Biomechanics Day, which is typically celebrated in April, is an annual event created by the American Society of Biomechanics in which labs around the world host K-12 outreach events focused on biomechanics education. At the University of Florida, National Biomechanics Day activities are jointly coordinated by Dr. Chris Hass, Dr. Daniel Ferris, and Dr. Jennifer Nichols. As such, the lab regularly participates. **All lab members** are encouraged to participate in National Biomechanics Day activities. Each year, there will also be an opportunity for a few students to assist with coordinating the event. Talk to Jen if you want to be more involved.

LAB TOURS & POSTER SESSIONS

Lab tours, poster sessions, and other research-related events are a great way to share the lab's activities with members of the department, college, university, and even the general public. **All lab members** are expected to assist with tours and events as their schedules permit. **Graduate and undergraduate students** are also encouraged to identify ways for the lab to interact with the university community and the greater Gainesville community. Talk to Jen about your ideas!

RESOURCES

LAB CALENDAR

This section has been redacted from the publicly available guidebook.

Current lab members are encouraged to reference the official version of the guidebook in the lab's Dropbox folder.

OPENSIM

OpenSim is the open-source musculoskeletal simulation package that the lab uses for its modeling and simulation research. All lab members should become familiar with the capabilities of OpenSim by completing the tutorials. Refer to "GettingStartedwithOpenSim.docx" (Dropbox/MBL_Lab/Resources/OpenSim) for a list of currently recommended tutorials. OpenSim is installed on all computers in the lab and is freely available to install on your personal devices.

MATLAB & PYTHON

The lab extensively uses Matlab and Python for research purposes. **Matlab** is installed on all lab computers. Students can also use Matlab for free through UF apps or purchase a student license directly from Mathworks (https://www.mathworks.com/academia/student_version.html). Students are not required to purchase Matlab for research purposes, but may find it more convenient to have access to a Matlab license from their personal device. Many of the lab's simulation projects take advantage of the OpenSim-Matlab interface. **Python** is installed on select lab computers and is also freely available to install on your personal devices. The lab is gradually expanding its use of Python and students may find it useful to learn this programming language depending on their research project and interests. We are currently using Anaconda and PyTorch.

VICON NEXUS

The lab owns a Vicon motion capture system. **Nexus** is the Vicon software used for collecting and processing motion capture data. The lab has 20 software licenses. One of these licenses is locked to the motion capture data collection computer in the lab. The other 19 licenses are set-up on a license server.

Whenever you open Nexus on a lab computer, it will automatically pull a license from the server to use. If you are off-campus, you will need to VPN into the UF network to access a license from the server. Note, the license server is one of the desktop computers in NEB 510 (labeled with a post-it note). Licenses cannot be accessed unless this computer is powered on. Important information regarding the location and set-up of the license server is below:

This information has been redacted from the publicly available guidebook. Current lab members are encouraged to reference the official version on the lab's Dropbox folder.

DROPBOX

All lab files are maintained through **Dropbox**, a cloud-based file storage system. Lab members are given a sponsored Dropbox for Education account that entitles them to 1 TB of storage. This account will be active for while you are an active lab member. This storage is for research-purposes only. All files (shared or not shared) will be transferred to Jen when you leave the lab. You should maintain a separate Dropbox account for personal files.

All presentations, manuscripts, and associated files (i.e., data and/or code to complete presentations and manuscripts) are required to be archived on Dropbox in a way that Jen can access them.

NEW LAB MEMBER CHECKLIST

The checklist below is intended to inform you of administrative policies, resources, and procedures used by the lab. **Please work through the checklist in its entirety within your first 2 weeks in lab.**

Required Administrative Tasks

- **Course Registration:** All students must be registered for the undergraduate (EGN4912) or graduate (EGN6913) research course. This requirement ensures students performing research are doing so in an appropriate and safe manner. Note, that you can register for 0 credits to avoid paying additional tuition and fees. However, there is a 1-credit tuition charge for 0-credit registration if you are not enrolled in any other courses.
 - To register, complete the registration forms found at the end of the course syllabi posted at <https://www.bme.ufl.edu/academics/forms>. **Engineering students** must register in the department that corresponds to their primary major by returning the signed form to their department's main office. **Non-engineering students** should talk to Dr. Nichols for directions on how to appropriately register. A completed, unsigned copy of the mentor page is available on the lab Dropbox (MBL_Lab/Admin/Nichols_EGN4912_Registration.pdf)

- **Slack:** All lab communication is conducted through the Musculoskeletal Biomechanics Lab Slack Workspace (<https://mbl-lab.slack.com/>). To join this workspace, ask Dr. Nichols to add you to Slack during one of your meetings.
 - Slack is organized into Channels and Direct Messages:
 - **Channels:** When Dr. Nichols adds you to Slack, you will automatically be added to the most relevant channels (#announcements, #articles, #career, #writing, #social). You can browse through all channels by clicking on the channel header or add new channels by clicking on the plus sign next to the channel header. You are encouraged to look through all of the channels and add the ones most relevant to you. Several channels are oriented around specific project topics.
 - **Direct Messages:** These are private messages between individuals or small groups of lab members. As private messages, Dr. Nichols cannot see the content of direct messages that are not addressed to her. **Direct message is Dr. Nichols preferred method of contact with everyone in the lab.**

- **Dropbox:** All lab files are maintained through Dropbox, a cloud-based file storage system. Lab members will be given a sponsored Dropbox for Education account that entitles them to 1 TB of storage. This account will be active for while you are an active lab member. This storage is for research-purposes only. All files (shared or not shared) will be transferred to Dr. Nichols when you leave the lab. You should maintain a separate Dropbox account for personal files.
 - Getting Dropbox Access:

- If you are an **OPS employee** (paid hourly), you can access UF Dropbox for Education by going to <https://cloud.it.ufl.edu/uf-dropbox/> and clicking on "Dropbox Sign-Up"
- **Everyone else** should send Dr. Nichols (jnichols@bme.ufl.edu) an e-mail requesting Dropbox sponsorship. The subject line should be "Request for Sponsored Dropbox." The body of the e-mail should include your name, lab affiliation, UFID, and a clear concise statement of your request. Dr. Nichols will forward this e-mail to the UF Help Desk (helpdesk@ufl.edu per the [FAQs page directions](#)). After approximately 72 hours, you should receive an e-mail from the UF Computer Help Desk providing directions on how to sign-up for Dropbox.
- Using Dropbox:
 - Once you have access to Dropbox, send Dr. Nichols a direct message on Slack and she will add you to the appropriate folders.
 - **On the lab computers, please make sure that your Dropbox files are not stored on the C: drive.** Dropbox folders should be stored on the secondary drive due to space constraints. When logging into Dropbox for the first time, you should be given the option to locate the Dropbox folder in the location of your choosing. If you already have a Dropbox folder on the computers, please follow the directions at <https://www.dropbox.com/help/desktop-web/move-dropbox-folder> (refer to the section halfway down the page titled "How to Move a Dropbox Folder"). Note, that you need to follow these directions; do not drag and drop the Dropbox file location.
- **Computer Access:** You can log onto the lab computers using your GatorLink ID and password. Each computer is equipped with the standard software that you will need in lab. If you require additional software, talk to Dr. Nichols regarding availability.
 - **Undergraduate Student Researchers** will share a set of computers designated as rotating work stations. Work with Dr. Nichols and your lab members to identify the computer(s) you are most likely to work on, as it is most convenient to use the same computer each day.
 - All **shared computers** have "Dropbox" and "Documents" folders on the D: drive that contain subfolders with your Gatorlink IDs.
 - **Documents Folder:** When you want to work locally on a machine (i.e., not on Dropbox), you should store your files in the "D/Documents/my_gatorlink" folder. You can drag and drop folders you have stored elsewhere (like the Desktop) to the your documents folder on the D : Drive.
 - **Dropbox Folder:** All of your Dropbox files should be stored in the "D/Dropbox/my_gatorlink" folder. Refer to the Dropbox section (above) for directions on how to move your folder appropriately. Do not drag and drop Dropbox.
 - **Graduate Student Researchers** will be assigned a specific computer and desk that will be there workspace for as long as they are an active lab

- member. Graduate students will be provided administrative privileges to their computers (see below).
- **Administrative accounts** are provided at the discretion of Dr. Nichols and BME IT. These accounts provide you with separate log-in credentials that should only be used to install approved software or update existing software. Regular day-to-day work should be conducted through your standard GatorLink account.
- **Lab Schedule:** An Excel spreadsheet detailing each lab member's course and research schedule is maintained on Dropbox (MBL_Lab/Admin/Schedules). This schedule is used to determine times for lab meetings and individual meetings. Please update this schedule with your activities by adding a column (labeled with your initials) to each day of the week and appropriately filling out the block schedule. The color code is described at the bottom of the semester-specific worksheet. Let Dr. Nichols know if you have issues or questions.
- **Lab Calendar:** The lab maintains an Outlook Calendar (**BME-Nichols-Lab-Cal**) that all lab members should join. This calendar is primarily used to schedule experiments in the lab space (NEB 513). However, events that the entire lab should attend (e.g., trainings, lab meetings, social activities) are also posted on through this calendar. To join the calendar, Dr. Nichols will need to add you to the Outlook security group (**BME-Nichols-Lab-Cal-sg**). Once you have been added to the security group, you will have read and write access to the calendar and will be able to add the calendar as a "shared calendar" to your preferred Outlook calendar app. Let Dr. Nichols know if you have issues or questions.
- **Lab Website & Headshots:** The lab maintains a public website that includes information on individual lab members. This can be a nice way to be recognized for your participation in the lab. However, **participation in the website is optional**. We recognize that some individuals prefer not to have their name and/or photo publicly posted.
- If you **have a headshot that you would like to have posted on the lab website**, please add it the Headshots folder on Dropbox (MBL_Lab/Admin/Headshots). *Your file name should reflect the name you would like posted online. Any reasonable file format (.jpeg, .tif, .pdf, etc.) is acceptable.* **IMPORTANT NOTE: The act of placing a headshot in the Headshots Dropbox folder will be recognized as your consent to have that photo posted publicly online.** Once you have placed a photo in this folder, send Dr. Nichols a direct Slack message, so she can add you to the website. If you prefer your photo be posted online in a format that will be more difficult for google (and other search engines) to associate it with your name, let Dr. Nichols know in that message.
 - If you **do not have a headshot, but would like to have one posted on the lab website**, let Dr. Nichols know and we schedule a time to take one outside. Keep in mind you can often make a nice headshot by cropping your head and shoulders out of a photo that includes more of your body.

- If you **prefer not to have your photo posted publicly online**, please let Dr. Nichols know and we will come up with an alternative for you to be recognized as part of the lab.

Important Note on Consent: Dr. Nichols and other members of the lab, department, or University will use headshots in presentations about the lab that are given locally, nationally, and internationally. If you do not want your image used in a given manner or in association with the lab, please let Dr. Nichols know. There are no penalties for choosing not to have your photo posted or publicly used in association with the lab.

Statement Regarding Twitter: Dr. Nichols (@JenNicholsPhD) and other members of the lab, department, or University use Twitter to promote the lab locally, nationally, and internationally. If you do not want your image or name used on Twitter, please let Dr. Nichols know. There are no penalties for choosing not to be included in Twitter posts.

Required Lab Safety Training

- **Gator TRACS:** The Gator TRACS (Tool for Risk Assessment, Compliance, and Safety) is an online portal managed by the University of Florida that includes a personnel roster, training, and risk assessment.
 - **New lab members** should log-on to Gator TRACS (<https://www.labcliq.com/l/ufl/>) and update their profile information (click the person icon next to your name in the top right corner, then the pencil icon in the pop-up window to edit your profile).
 - **Each year**, lab members will be required to sign into Gator TRACS to access LATCH (Laboratory Assessment Training & Chemical Hygiene) and sign the annual Risk Assessment. Directions will be posted on Slack.
- **Safety Training:** All safety training is accessed via MyUFL (Main Menu -> My Self Service -> Training and Development -> myTraining). The courses that each lab member should complete are listed below.
 - **UF_EHS862: Lab Safety Actions & Reactions:** This course is required per University of Florida policy for all lab staff.
 - **UF_EHS809: Hazardous Waste Management:** This course is required per University of Florida policy for all lab staff.
- **Human Subjects Training:** To conduct experiments involving human subjects, additional training must be completed, which is summarized at <http://irb.ufl.edu/index/requiredtraining.html>. Complete all training (including recommended HIPAA training) associated with IRB-01, which is the Institutional Review Board (IRB) at the University of Florida that approves the lab's experimental protocols. If you are unsure whether you will be participating in human subject experiments, talk to Dr. Nichols prior to starting this training.

Optional Administrative Tasks

- **Building Access:** *This information has been redacted from the publicly available guidebook. Current lab members are encouraged to reference the official version on the lab's Dropbox folder.*

- **Printing:** Printing is a privilege that will be taken away if you use it inappropriately. All printing requires a code that is directly tied to you. This means everything you print can (and probably is) monitored. So, please use the printer for research-related tasks.

Information on how to get a printer code has been redacted from the publicly available guidebook. Current lab members are encouraged to reference the official version on the lab's Dropbox folder.

- **VPN & Remote Access:** Lab members interested in using the lab computers remotely can request VPN and remote access. VPN will allow you to access the UF network from off-campus, while remote access will allow you to directly log-on to one of the lab computers from off-campus.

Information on how to use VPN has been redacted from the publicly available guidebook. Current lab members are encouraged to reference the official version on the lab's Dropbox folder.