FDT Laboratory Participation Guide and Expectations*

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Welcome to the Flow Dynamics and Turbulence (FDT) Laboratory. This document is to set the general expectations for students and members of the lab and to give you an understanding of how it feels to work with me while deciding to join the lab in the first place. You should note that this guide does not describe the process of earning a graduate degree from the University of Texas at Dallas (UT Dallas); it is rather a combination of a practical guide and treatise on how we do research. My goal as a Principal Investigator (PI) and mentor is to foster an inclusive environment in the lab where everyone can be happy and productive and reach their full potential as independent scientists. The present lab manual is intended to be the starting point for a positive mentor-mentee relationship and lab experience — but, ultimately, a rewarding experience requires active investment in and refinement of our one-on-one interactions over time. I hope you can help me shape this evolving document and let me know the aspects you would like to be added, clarified, and improved.

1 About the lab

The FDT Lab was established in late 2022 and is part of the Department of Mechanical Engineering (ME) at UT Dallas. It is an interdisciplinary research group dedicated to understanding the nature of turbulence and examining turbulent flow processes in different natural, industrial, and engineering environments using experimental, numerical, and theoretical approaches. Particularly, our research agenda is focused on studying turbulent air-sea interaction processes, including surface waves and the accompanying generation of turbulence, spray, bubbles, airflow separation, and breaking waves. Another strand of our research is devoted to studying the turbulence structure in hurricane boundary-layer flows and examining the impacts of wind-wave interaction processes on offshore wind turbines and on-shore structures. In general, our research field is of interest to engineering, applied mathematics, and oceanography scholars. The physics learned from our work directly impacts our understanding of air-sea couplings and ocean waves, which is crucial for weather and climate forecasting and has significant societal benefits, impacting many aspects of human life.

2 Mentoring Philosophy

As a mentor, my primary objective is to prepare you to achieve your goals and succeed in your future career in either government, industry, or academia. My approach to mentoring you is thus tailored to your needs and is different from other lab members. This requires some understanding of the current state of your intellectual and professional development. In addition to the specific needs of each trainee, I aspire to help you become an independent scientist by developing a set of universal, lifelong skills such as critical thinking and problem-solving abilities.

* This document is the first draft of an in-progress guide on some tips and resources to get you started participating in FDT Lab. Please, feel free to contact me to clarify anything in this document. This lab manual was inspired by similar efforts by other colleagues, for example, Prof. Christopher J. Zappa and Prof. Baylor Fox-Kemper.

To promote your success, I will encourage you to apply for and pursue different scholarship, fellowship, and award (grant funding) opportunities. Similarly, I will notice and recommend professional development, networking, and job opportunities in accordance with your goals and directions. In the latter cases, I will foster a collaborative work environment through which you can discuss your research and collaborate with multiple people within UT Dallas and other institutions. Also, to the extent that you aspire and that does not affect your program, I will make efforts to involve you in leadership and service opportunities. For example, at some point in your development, I will offer you the opportunity to review journal manuscripts (within your expertise area) and ask the editor to add you as a co-reviewer so that you can receive credits for the work. Also, as your research ideas take shape, we will assess the prospect of writing a grant proposal to support some or all of your work. This is particularly useful if your research drifts considerably from the project(s) on which you are funded. Grant writing opportunities are explicitly offered and expected from postdoctoral researchers with the possibility to be a (Co-)PI on the grant application. Further, I will encourage thesis track graduate students to prepare their research proposals in the format of, for example, an NSF proposal to give them practice in preparing grant applications. Non-thesis M.S. students would also be encouraged to prepare their final project as a critical review article for publication in a peer-reviewed journal.

In the end, I mainly ask you to bring a willingness to work hard, think critically, be open to changing and developing, and commit to science, truth, and kindness; I will endeavor to bring the same to our relationship. I also believe that the mentor-mentee relationship is reciprocal—you have unique experiences, skills, and ideas that I do not, so please share them. Remember, you have been selected not just because of your **passion and enthusiasm for learning** but because of your unique **perspectives on the problems**; I look forward to learning from you. At any point, if you face a barrier affecting your ability to work and contribute to your fullest extent, please let me know (in as specific or nonspecific terms as you are comfortable with), so we can work together with campus resources to make necessary accommodations.

3 Expectations

In our pursuit of knowledge, we encourage an environment of collaboration, open communication, and trust, which **welcomes diversity** and **respects different opinions**. The FDT Lab members come from diverse personal and academic backgrounds, so all lab members should treat each other with utmost respect and dignity and strive to create an inclusive and welcoming environment; everyone should feel welcome and conformable. All lab members are also encouraged to bring up situations when the practices in the lab do not align with this expectation. Disrespectful behavior, division/exclusion, harassment, and/or scientific misconduct will not be tolerated.

Above that, as a lab member, you are expected to bring your enthusiasm and curiosity, have a proactive attitude, and contribute to the group, both intellectually and operationally. Research is hard (but fun), and as part of it, you will face challenges, make mistakes, and feel discouraged to finally develop new expertise and make discoveries. However, as scientists, we are expected to be careful, accurate, and reliable. So, we never rush our work and always incorporate sanity checks and take academic honesty seriously. We are conscientious, rigorous, and collegial members of our scientific communities; as such, we recognize that trust, both in the process and results, is of primary importance. Despite the challenges in performing high-quality scientific research, I will do my best to advise and support you to be successful. Approaches will rarely work as expected the first time, as such perseverance through occasional roadblocks is key to a successful research career.

3.1 Expectations of PI

My primary role is to advise and mentor a fantastic team of undergraduate trainees, graduate students, and postdoctoral researchers. Below are some expectations with respect to my role, which might vary slightly according to your specific role. One point of enumerating my responsibilities is to emphasize that I have many demands on my list that must be managed carefully. So, please, allow at least one week for non-time sensitive documents/requests and even longer for letters of recommendation. At the same time, my door is always open to you, and you are welcome to stop by my office with any questions or concerns. Finally, a two-way feedback culture is critical to a successful lab environment. So, please, let me know if you have other expectations of me as a mentor. I am always happy to receive your constructive feedback; send me anonymous feedback here.

1. Advising on the overall direction of your research project and providing scientific mentoring to help you develop into a scientist capable of defining and executing independent research. This process is challenging but intended to get the best from you.
2. Providing feedback on all aspects of your work, including project ideas, underlying questions, specific methods and technical approaches, conference posters/presentations, manuscripts, and grants, to ensure your work is of the best quality possible. I will also give feedback on course selection, overall career goals, and long-term strategy, in addition to helping you to select advisory committees and manage their input.
3. Overseeing the publication process, including proofreading and contributing to writing manuscripts, posters, and presentations, identifying journals/conferences to target, and helping manage the ups and downs of the revision process.
4. Supporting your career development and goals by writing recommendation letters, assisting you in contacting collaborators and networking opportunities, promoting your work at talks/seminars, and encouraging you to attend targeted conferences.
5. Caring for your physical, mental, and emotional well-being and providing moral support during the emotional rollercoaster of your graduate studies and research, in general.
6. Seeking grant funding opportunities, including federal and state grants, fellowship and scholarship applications, teaching and research assistantships, and undergraduate assistantships (e.g., UROPs, SURFs, and REUs). Explicitly, I assist graduate students and postdocs with identifying and applying for fellowships, scholarships, and grants before and during their time at the lab.
7. Teaching classes every semester, which occupies a large fraction of my available time and effort.
8. Performing departmental services, including attending department meetings, participating in committees, and serving on students qualifying exams, thesis proposals, and thesis defenses.
9. Providing community services, such as participating in community workshops, science committees, and professional organizations (e.g., APS, ASME), as well as reviewing papers and proposals on an ongoing basis.

3.2 Expectations of Postdoctoral Researchers

Postdocs are excellent colleagues and reliable mentors to the other junior lab members. They have fewer responsibilities than the PI and have the experience to function independently. To put it another way, a postdoctoral researcher is only about three years away from becoming a professor. As a postdoctoral researcher, you are expected to,

1. Develop your own line of research, operate independently, and play a leadership role in managing projects on which you are working. This can include developing new research ideas, coordinating among team members, securing the necessary materials to complete your work, and developing new collaborations.
2. Apply for funding, either postdoctoral fellowships, internal seed funding programs, or external research grants. I will support you with submitting proposals, including working on the proposal text, but you must lead the work. It is in your best interest to get experience writing grants, and I expect postdocs to contribute largely to one internal and one external grant.
3. Write high-quality manuscript drafts that are almost ready for submission. You are expected to take the lead in writing the papers and also contribute to the writings of more junior lab members; depending on the level of contribution, you can be added as a co-author (see authorship section).
4. Present your work at departmental seminars, workshops, and conferences. This is integral to getting the word out about your research and initiating new collaborations.
5. Communicate and collaborate with other lab members, attend and present in group/lab meetings, ask questions, read and share papers, and look for opportunities to participate.
6. Share your expertise and knowledge by letting lab members know about new papers, giving feedback on others' work at group meetings, and setting a good example of proper research conduct, integrity, and work ethic. You are also expected to provide advice and guidance to junior team members and contribute to a creative, collaborative lab environment.
7. Provide technical training and mentorship to both undergraduate and graduate students in the lab; junior group members will benefit immensely from your mentorship, and you will gain valuable experience along the way.
8. Define your career goals, make a concrete plan for the future, and apply for jobs when you are ready; I will do everything I can to support you. During our early meetings, discuss and identify the skills you want to develop as part of your postdoc. For example, if you are interested in gaining teaching experience and /or mentoring experience.
9. Produce reusable data and code scripts for the rest of the group and the scientific community. You are expected to share the outputs of your research, including data, software, annotated codes, and detailed methodologies, in a way that can be reproduced with minimum additional instructions.

3.3 Expectations of Graduate Students

Graduate students are active participants in our lab and are the driving force behind research initiatives and projects. They will be trained to become experts in their research fields, independent scientists, supportive mentors, and excellent colleagues. Grad students have a complex range of responsibilities, and learning to deal with them is part of the journey. Ph.D. (M.S.) students can expect to spend typically 4-6 years (2-2.5 years) to complete a doctoral (master's) degree. As a graduate student in the FDT Lab, you are additionally expected to,

1. Stay in good academic standing and on top of your coursework. It is your responsibility to understand and meet all the formal requirements of the program and to stay ahead of all deadlines regarding registration, paperwork, qualifying exams, supervising committee assignments, and thesis/dissertation defense, among others. Most students in my lab are enrolled in the ME graduate programs and should follow the department's M.S. and Ph.D. Graduate Student Handbooks as an essential reference. Questions beyond the ME Graduate Student Handbook should be addressed to Ellen Klimpel.

2. Develop a professional and organized initiative to prioritize your time to do research and manage your coursework, teaching assistant obligations, and other responsibilities. This is a big challenge in graduate school, and unfortunately, there is no single formula that works for everyone. You have to come up with a system that works best for you; ask your peers and other lab members for their valuable suggestions. Your research is the most important part of your graduate school, and you should approach it with the seriousness and professionalism you would do for a full-time job.
3. Develop independence and increase your perseverance as you progress through your degree to ultimately become an independent scientist capable of managing and leading a research project. Independent does not mean being alone, but it means taking the initiative, gathering knowledge, formulating ideas, and then bringing all of that into dialogue with others who can help.
4. Identify and develop your research project in consultation with the PI and develop a research plan accordingly. Your dissertation should have at least 3 research objectives that answer parts of a big-picture question. You should develop a long-term research plan with clearly defined milestones and goals. Also, you should have a shorter-term plan (weekly, monthly, and quarterly) to work on and move towards those goals.
5. Apply for graduate research fellowships and scholarships (e.g., NSF GRFP, GEM Fellowship, and UT Dallas Graduate Fellowships) early in graduate school. I will support you with submitting proposals, including identifying project ideas, working on the proposal text, and writing reference letters, but you must lead the work.
6. Become a teaching assistant (TA) in courses relevant to your core research area. Given that teaching helps in developing various soft skills, such as communication, leadership, and organization, that are key for any career path, it is critical for graduate students to be trained to teach. Each Ph.D. student in my lab is required to be TA at least twice during their graduate career, preferably early in their studies. You should plan to maintain adequate progress toward your research objectives when you are a TA.
7. Present your work at conferences and attend (departmental) talks, seminars, events, and workshops relevant to your research. Once your project is developed and its research goals have been achieved, you can expect to participate in at least one conference per year. This is integral to getting the word out about your research, networking, and initiating new collaborations. Other sources of travel funds, such as travel grants, may need to be sought if you want to participate in more conferences, which is encouraged.
8. Produce at least one publication for each of your research objectives with the possibility of additional co-authored publications depending on the level of collaboration you aim to be involved in (see authorship section).
9. Communicate with other lab members, attend and present in group/lab meetings, ask questions, read and share papers, and look for opportunities to participate.
10. Select a supervising committee, preferably by the end of your first year (details can be found in the ME Graduate Student Handbook), and schedule committee meetings every semester. You need to gain advice from supervising committee and consider their inputs in developing your research project.
11. Provide mentorship and training to undergraduate researchers. As a graduate student, you should take the opportunity to help mentor and supervise undergraduate students in the lab. Depending on their project, undergraduate students can also help you perform experiments and analyze data.
12. Produce reusable data and code scripts for the rest of the group and the scientific community. You are expected to share the outputs of your research, including data, software, annotated codes, and detailed methodologies, in a way that can be reproduced with minimum additional instructions.

13. Discuss your career goals with me; we will make a concrete plan for your future and ensure you receive the required training for that career and are exposed to appropriate opportunities. Remember, it is never too early to start thinking about your career goals, and I will do everything I can to support you.
14. Communicate with the PI through each of these steps and always ask questions. You should feel comfortable speaking up if something is unclear to you, either a scientific question or a procedural/administrative issue. I always support you and aim to smooth out your graduate school experience in the best way possible.

3.4 Expectations of Undergraduate Students

Undergraduate students are critical contributors to our lab activities and research. There are many opportunities for undergraduates seeking to conduct research for class credit, as a research assistant, and on a voluntary basis in the FDT lab. Undergraduate trainees are expected to commit to a minimum number of hours over a set period of time (usually 1-2 semesters that may continue upon mutual agreement) and must realize that they have to spend at least 10-15 hours a week to be effective. Research takes considerable commitment and discipline and requires hard work and perseverance to lead to success and shape your future career plans. Undergraduate students can join the group at any time, and while you are here, you are expected to:

1. Develop a research plan with clearly defined milestones and goals in consultation with your advisor. You have the opportunity to work on your own independent project (possibly in collaboration with another lab member) or work on a project led by graduate students and/or postdocs within the lab. In the latter case, you are encouraged to make intellectual contributions and add rigor to the project.
2. Develop your weekly schedule by talking to your graduate student or postdoc mentor. Each week, for individual meetings, you should have a short-term plan for exactly what to work on to move towards your research goals.
3. Communicate with other lab members, attend individual and group/lab meetings (as your schedule permits), read and share papers, and actively look for opportunities to participate in lab activities. If you are earning course credit for research, you must attend lab meetings, present at one of the meetings, and submit a write-up of your research by the end of the semester.
4. Cultivate your curiosity by asking questions about what you are working on, why you are being trained on something, and how your project fits into the larger picture. You should also speak up if something is unclear to you, either a science question or a procedural/administrative issue.
5. Participate and present in undergraduate research conferences, such as UT Dallas Undergraduate Research Symposium, Capital of Texas Undergraduate Research Conference, and National Conferences on Undergraduate Research. Undergraduate students can and are encouraged to be (co-) authors of peer-reviewed publications. It will take considerable effort to become a published author; it is not guaranteed, but it can be done with hard work and perseverance. To be credited with authorship, you should, in general, make substantial scientific contributions and add intellectual merit to the project (see authorship section).
6. Stay on top of your coursework. We are excited for you to progress in your research skills and support your efforts to succeed scholastically, but the time you spend doing research in our group should not negatively impact your degree responsibilities. Please talk to me if you find it difficult to balance classes with research.

7. Produce reusable data and code scripts for the rest of the group and the scientific community. You are expected to share the outputs of your research, including data, software, annotated codes, and detailed methodologies, in a way that can be reproduced with minimum instructions.

3.5 Work Schedule

One of the great advantages of working in academia is the flexibility in the work schedule and the possibility of remote/hybrid work. But this flexibility can also be a hurdle, especially for students with self-discipline and perseverance difficulties. Although lab members have no definitive core work hours, I encourage everyone to be in the office for core hours (roughly 9:00 am - 5:00 pm or shifted slightly depending on your preferences) to promote group interactions, joint discussions, brainstorming, and camaraderie. That said, you are expected to manage your time to achieve goals established in weekly meetings, so find the schedule that works best for you; productivity is much more important than hours. Also, lab members are welcome to work remotely from time to time, given the nature of the project and PI's approval; remote work is not ideal for everyone and every project. However, all lab members are expected to participate in lab events and monitor lab slack during core hours to facilitate group interactions.

I sometimes work at night and on weekends, meaning you may receive emails and/or Slack messages outside regular working hours. Communication beyond core working hours and over weekends is optional, barring major project deadlines (e.g., for a proposal deadline or conference due date). In those time-sensitive cases that I might urgently need something from you over the weekend, I will try to bring it up in advance so we can plan accordingly. Also, all lab members are expected to meet deadlines for major projects, proposals, conferences, and fellowship/scholarship applications. In that regard, I try only to work overtime and on weekends when it is absolutely necessary. Please keep that in mind and make sure to give me enough heads-up about impending deadlines on weekends/Mondays so that I can get things done for you (e.g., write letters of recommendation, give feedback on manuscripts) while maintaining my work/life balance.

All group members can take vacations as agreed upon by the PI. You should be clear about when you are on vacation, as opposed to working remotely. Lab members expect you to be working and available on our communication channels if you do not take vacation days. Travel dates for vacation (and non-vacation remote work) must be approved by the PI. These requests should be made via email at least one month before any planned travel and cannot clash with lab work. For more information on the UTD Leaves of Absence policy, see UTDBP3054.

4 Communication

4.1 Email

All important and official correspondences will happen through email; you are expected to check your email often. I also monitor my email (kyousefi@utdallas.edu) regularly and try to be as responsive as possible, but many communications may be lost due to the extensive and relentless inbox. Please remind me through slack if I never respond to your email.

We also have two email addresses associated with the lab, including a lab listserv for sending emails to the entire lab when necessary (fdtlab@utdallas.edu) and one for sending emails to the lab meeting group (fdtlabmeetings@utdallas.edu, which may include people that are not members of the lab); contact me to get added to the lab listservs.

4.2 Slack

Slack is our preferred mode of communication for interactively discussing more informal academic, scientific, and workplace matters. However, I like to keep serious research discussions and/or formal requests for group meetings and e-mail; based on my experience, slack communications can be misinterpreted sometimes. I attempt to respond to slack messages (not necessarily immediately). If it is an emergency and I am not responding on slack, e-mail me.

There are different channels on the FDT Lab slack workspace; You should check the appropriate channel when posting messages or looking for updates. #general is for general lab announcements, #lab-meetings is for communications related to group meetings, #papers is for sharing lab-relevant papers and discussing them, #computing-resources is for communicating wisdom on code writing, sharing your code scripts with other group members, and asking/answering the coding questions, #experiments is to share knowledge about experimental techniques, results, and analysis and ask/answer questions about experiments, and #random is for non-work-related chatting. Try to keep each channel on the topic so that people can subscribe only to the channels that concern them.

4.3 Social Media

All lab members are encouraged to communicate about and promote their research through public social media, such as LinkedIn and Twitter, in accordance with our code of conduct and the University Intellectual Property Policy (UTDPP1002). You are also encouraged to have a Google Scholar profile (once you have something indexed or published) and a ResearchGate account to boost your academic profile and expand your professional network.

4.4 Calendars

There is one main calendar for the lab (runs from the account fdtlab@utdallas.edu) that will be used to keep track of core lab events, including lab meetings, individual meetings, deadlines, and birthdays. We also use this calendar to indicate individual availability, travel dates (out of the office), vacations, and conference travel so that other group members know when you are unavailable. It is not mandatory to put down your travel dates, but that is helpful for planning purposes; for example, not to bother with lab meetings when no one is around.

5 Meetings

5.1 Individual Meetings

Weekly individual meetings are your protected time to discuss research and anything else of concern. Every lab member will have a one-hour slot to meet with me individually once per week. Timing for weekly meetings will be scheduled when members join the lab and then modified along the way to accommodate class schedules and personal preferences. You are encouraged to reach out if, at any time, an additional meeting time is required. If scheduling conflicts arise, we can try to reschedule for another time. For individual meetings, group members will prepare an agenda and lead the discussion that can include everything from research to admin questions, but you are expected to address how the previous week's research goals have been achieved and plan for the following week. I will meet with undergraduate students at least every other week (or based on their needs); post-docs and graduate students should meet with their undergraduate mentees on a regular basis. You can follow this template to prepare for your weekly meeting; this will ensure we cover certain topics weekly.

5.2 Group Meetings

Group meetings (approximately 1.5 hours each) are to discuss ongoing projects by team members, stay current with the literature, and plan for future studies. One primary purpose of group meetings is to provide a forum for lab members to present a detailed update on their work. This can be anything related to the research program, such as background studies, project ideas, ongoing data collection and interpretations, and future directions. Lab members should expect to present their ongoing research approximately every 4 months. These group meetings (or ad-hoc scheduled meetings) can also be used to prepare for conference presentations, job talks, and other external presentations.

Most of our group meetings will be set aside for journal clubs to present interesting and relevant literature. This is an opportunity for lab members to strengthen their ability to comprehend and critically analyze research that has already been conducted. So the presenter is expected to provide a critical analysis of the paper rather than a simple review. For paper discussions, we typically focus on a single paper that everyone must read prior to the meeting and be prepared to contribute with comments and questions. Some weeks we may explore a specific theme/issue and have people read different papers; in that case, you should be prepared to summarize the paper for the group and do a mini-presentation.

For group meetings, the student leading the discussion is expected to prepare an informal presentation with optional handouts and/or notes. This will help the rest of the group to follow and facilitate a thorough discussion. Although these meetings are informal and their primary intent is to contribute something substantive, they are an opportunity for you to hone your presentation skills. All lab members, including undergraduate research assistants, are expected to attend and actively participate in group meetings. Part-time lab members and voluntary undergraduate researchers are invited but not required to attend. If you have a conflict that prevents you from attending, contact me ahead of time. I attempt to schedule group meetings at a time that is convenient for the maximum number of people, which varies each semester. Group meeting announcements, agendas, and planning will always be in the #lab-meetings channel in Slack. Here is an example format/template you can follow to prepare for group meetings.

5.3 IDP Meetings

In addition to the regular meetings, graduate students and postdoctoral researchers will also have a one-on-one meeting focusing on their long-term evolution every six months. These are structured meetings to explore and define your training goals, professional development needs, and career objectives so that we can focus on the required competencies and their development in the course of your training period. These are also for me to get feedback from you on my mentoring efforts. All graduate students and postdocs must complete and discuss their Individual Development Plans (IDPs) with me within six months of your start date. We will then have biannual IDP progress meetings to evaluate your overall progress, revise and modify the plan as necessary, and set goals for the next interval. You can use any standard IDP forms in the science and engineering fields to draft your initial IDP. Here and here are some resources and templates. You can also use myIDP, a web-based career-planning tool that assists graduate students and postdocs in defining and pursuing their career goals.

5.4 PI Office Hours

In addition to weekly meetings and occasionally dropping by the lab, you can find me in my office at xxx (xxx). My door is almost always open; if it is, feel free to stop for a short chat. I will always be happy to talk to you,

though sometimes I can only spare a couple of minutes or might ask you to wait to finish typing a sentence. If my door is closed, assume that I am either gone, in a meeting, or in the middle of writing that I do not want to be disturbed, so please send a message (Slack or e-mail) rather than knocking.

5.5 Intra-lab Events

Within our lab, we recognize that team members regularly go above and beyond lab expectations. I will host an annual winter holiday lab party and organize other outing events during the year to support lab camaraderie, promote causal and social interactions within the lab, and celebrate team successes. While attendance is not required, we strongly encourage all lab members to attend and, when applicable, bring significant others and/or families.

6 Authorship

Authorship is an important mechanism to allocate credit to researchers for their contributions and carries ownership, responsibility, and accountability. Many factors go into the consideration of authorship and authors' order. Fortunately, this has been given much thought by others (see the Resources section). In general, authorship is limited to those who have made a significant scientific contribution to the conceptualization, design, execution, and interpretation of the study and drafting or revising the manuscript critically for important intellectual content.

The first author is the person who contributed most to work, including the writing of the manuscript[†]; that is usually the graduate student or postdoctoral researcher who leads the project. The lead author is expected to be responsible for the bulk of the project, including data acquisition, analysis, figure preparation, writing the first draft of the manuscript and cover letter, and responding to the reviewers/editor. For this authorship position, you should also commit to the successful completion of the project and any resulting publications which may span beyond your time in the lab. In the rare, unexpected event that a member of the lab leaves and stops making contributions to the writing of the manuscript, the project may be passed to another lab member to complete the paper. This may change the order of authors depending on their contributions and the status of the manuscript. Thus, I strongly recommend that you ensure the manuscripts of your work are almost in ready-for-submission status before leaving the lab.

The first author is not the same as the corresponding author, which is, in most cases, the PI. Also, I will usually be listed as the last author, regardless of my contribution, unless we decide on a specific exception. If applicable, the sequence of other co-authors will be determined by their relative overall contributions to the manuscript. Following our value for teamwork, all lab members are encouraged to collaborate and have the opportunity to receive co-authorship, given their sufficient intellectual involvement and scientific contribution throughout the project. Authorship should be discussed at the outset and throughout the project development, but any

[†] Writing a paper for the first time can be an intimidating task. To smooth out this process, as your project coalesces and once we have determined you are ready to write a paper, we will work to create a manuscript outline, which will help to plan and organize your paper into key topics. I will then create a dedicated Overleaf project and share it with you so we can collaborate on writing. However, I expect you to write the first draft of the manuscript based on the initial outline. I can help you substantially with the writing if it is your first time, but I want to ensure that you put sufficient effort into learning the skills of scientific writing so that you can write the second time independently. See the Resources section for some resources on writing scientific papers.

authorship issues must be discussed early. Negotiation of authorship (both inclusion and order) should be open, professional, and respectful. Some authorship cases are borderline and should be discussed on an individual basis with me. All minor contributors are included in the acknowledgments section; that includes, for example, technical services, editorial assistance, formatting of the manuscript, minor preparation of research results (e.g., figures), performing basic statistical analysis, literature search, general training/supervision of junior researchers, performing routine lab jobs, making comments in lab meetings, sharing code scripts, and helping with minor code developments.

Finally, our lab is dedicated to producing robust and reproducible science; therefore, all authors should ensure that all the data are complete, accurate, and reasonably interpreted and that all formulations/theories, codes, and figures are precise and in a distributable/publishable format. Data manipulation of any kind will not be tolerated (see the Research Integrity section below).

7 Research Integrity

At the FDT Lab, the integrity and quality of our science are of utmost importance. We are committed to ensuring and upholding research integrity and take a hard line on research misconduct. While mistakes happen to everyone, we will not tolerate fabrication, falsification, or plagiarism; any patterns associated with plagiarism and/or data manipulation will be reviewed very seriously. You should always be honest in reporting your research findings; even if you find a mistake that compromises the entire experiment (no matter the importance/cost), we would rather redo the experiment than report illegitimate findings. Occasionally there are clear cases of research misconduct, but more subtle issues like self-plagiarism, excluding/expanding data, or misrepresenting data are also violations of research integrity, which may happen due to ignorance. Thus, you are advised to be open, honest, and transparent and always report any issues in the data/experiments to the PI immediately so that you do not find yourself in a situation where you are unknowingly compromising research integrity. For further information, see the UT Dallas policies on responsible conduct of research (RCR and UTDPP1070).

8 Code of Conduct

The FDT Lab is built upon a foundation of inclusivity and mutual respect and promotes a safe and harassment-free environment for everyone. We are dedicated to fostering a welcoming and supportive environment for everyone, regardless of gender, gender identity and expression, sexual orientation, disability, physical appearance, race, ethnicity, age, religion (or lack thereof), or political views. We do not tolerate harassment, bullying, or discrimination by and/or of members of our community in any form. As such, we do not tolerate deliberate intimidation, stalking, following, harassing photography/recording, sustained disruption of talks or other events, inappropriate physical contact, or unwelcome sexual attention. Finally, all communications should be appropriate for a professional audience, including people of different backgrounds. Sexual language and behavior are not appropriate in any professional context, including individual/group meetings, online communications, work-related social events, lab outings, and conferences.

All members of the lab must understand and comply with this code of conduct and the UT Dallas policies and procedures regarding discrimination and harassment (see UTDBP3090, UTDBP3102, UTDBP3105, and UT System Policy 105). Anyone violating these rules will be approached by the PI and, upon persisting the inappropriate behavior, may be suspended temporarily or permanently from the group, at the PI's discretion.

The **PI is a mandatory reporter** and will **report any incidents of harassment or misconduct** that violate these policies. To report an issue, please visit Institutional Compliance, Equity, and Title IX Initiatives or contact me at kyousefi@utdallas.edu; all communications will be treated as confidential.

Resources[‡]

Many different resources and books are available on how to write a scientific paper (e.g., Glasman-Deal 2010; Plaxco 2010; Schimel 2012; Turabian 2013; Denney & Tewksbury 2013). These are only some examples to get you started. In addition, you can find credible writing guidelines such as the Writing Guides by Sweetland Center for Writing of the University of Michigan. Generally, an excellent science written-up is directly linked to reading many high-quality scientific papers. You should always maintain an active literature search for papers and read continually. You can find high-quality articles and resources through Google Scholar/Scopus and the bibliographies of other papers/textbooks. Indeed, hours in the library can save you months in the laboratory.

The research that we perform in the group is usually highly mathematical. Some good references on basic concepts of mathematics and mathematical fluid dynamics are Greenberg (1998), Arfken & Weber (2011), and Galdi, et al. (2012). A good understanding of signal processing is also quite practical in our field. Some excellent references on signal processing are Hayes (1996), Smith (2002), and Bendat & Piersol (2011). Mathematica Online and Wolfram Alpha are excellent resources, either.

Indeed, fluid mechanics and turbulence are the essence of our research. There are valuable reference books for intermediate and advanced topics in fluid mechanics, for example, Kundu et al. (2015), Graebel (2007), and Schlichting (1979). Pletcher et al. (2012) also provide a comprehensive overview of fundamental computational fluid dynamics. For turbulence and turbulent flows, Tennekes et al. (1972) and Pope (2000) are suggested references. Finally, Holthuijsen (2010) is the best source to begin learning about ocean waves; it provides a valuable introduction to surface waves and explains complex processes with remarkable clarity. Other books with a broad scope in the field of ocean waves are Phillips (1980), Komen et al. (1996), and Jones & Toba (2001). These references can be heavy on mathematics. Panofsky & Dutton (1984) also is an incredible book focusing on the larger scale of atmospheric turbulence.

The followings are also some general readings regarding graduate school, doctoral studies, career development, and self-care. I usually update this list whenever I come across an interesting article or blog post that is related to higher education in general.

- The PLoS Computational Biology has an editorial series called *Ten Simple Rules* that provides a short set of guidelines for undergraduate researchers, graduate students, reading scientific papers, developing good reading habits, writing a literature review, writing a postdoctoral fellowship, and improving academic work-life balance, among others.
- From lectures to the lab: three steps to becoming an undergraduate researcher, Nature Career Column, July 2018.
- Here is the illustrated guide to a Ph.D. by Matt Might. It is a beautiful description of the wonder of conducting research.
- Here is some advice on how to review a paper by Benos et al. (2003), Pain (2016), Stiller-Reeve (2018), and Alabugin (2021).

[‡] Let me know if you do not have access to any of these resources; you can borrow a copy of mine.

Here are also some general technical resources, including software, code snippets, and professional/academic services, that you might find related and useful.

- Web Plot Digitizer is a web-based tool to extract data from different figures, plots, images, and maps. This is particularly useful when you need to compare your results against other published works.
- Canvas GFX and SketchUp can be used to produce stunning two- and three-dimensional technical illustrations/schematics with rich interactive content. See some of the schematics in our website.

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