



## CCS Student Mentor Training Document

**Disclaimer:** This document is under development.

Welcome CCS Student Mentor!

We are thrilled that you will be working with us to develop the computational community at UM. Your encouragement, advice and feedback will prove to be critical to our success.

Our vision for the CCS Student Mentors Program is to operate as a nucleus of computational activity at UM by fast-tracking computational experiments towards results and, perhaps more importantly, providing a mechanism for the UM computational community to flourish through the connection of researchers, the exchange of ideas and formation of collaborations. In becoming a CCS Student Mentor, you have chosen to position yourself at the center of this network and in doing so, to serve your community. That makes you pretty awesome.

However, the program is not only about service, it also provides an opportunity for you to develop your mentoring skills in a conscious and deliberate way. Sharp mentoring skills are a win for you, and a win for the population that we serve. Setting you up for the focused development of those skills is the purpose of this document.

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### Acknowledgements:

Many thanks to Will Silverman and the Launch Pad initiative at the University of Miami for sharing the Venture Consulting Program's training documents which served as a basis for some of the material in this document.

## **Philosophy of Mentoring in the CCS Student Mentors Program**

### **Skills are transferrable and discipline boundaries can be fuzzy**

CCS is a resource center designed around the idea that computational science is a powerful tool to connect disciplines and drive innovation. In this frame of reference, the CCS Student Mentors program extends its services to all schools and colleges, and welcomes the connections between diverse sets of disciplines based on the common ground of computational tools and methods. The program currently includes mentors from computational biology and marine science, and it is our hope that it will expand into the social sciences, the digital humanities, architecture and even journalism as the computational methods employed in these fields become more commonplace. The core set of skills that you have as a computational researcher is often transferrable to problems coming from diverse disciplines. Therefore, as a mentor, you are encouraged to take a ticket from a researcher outside your field, at your discretion.

### **Unwavering trust and support**

Although not always acknowledged, social interactions can be strong environmental influences that shape the relationship that a researcher develops towards computational science. We must always remain supportive of the researcher, regardless of the stage of their analysis or its likelihood of success or failure. Along with our unwavering support, it is imperative that we maintain the highest standards for honesty and integrity in our dealings with the researcher in order to engender an atmosphere of trust. Creating an atmosphere of comfort and trust is fertile ground for researchers to pursue their analysis with confidence and ask the questions that will take their project to the next level.

### **Conflicts of interest and confidentiality**

Fostering an environment of trust and respect within which researchers receive reliable guidance and mentoring is an unwavering priority and is essential to preserving the Program's integrity. A "conflict of interest" is broadly construed to reference any situation or activity that tempers the unbiased role of the mentor. Researchers rely on us to accelerate their analysis and act in their best interest. Our services are free, and the researchers should know that the results of their efforts are to their benefits, not ours. In the cases where a researcher may come to you with unpublished data of a sensitive nature, whether that sensitivity is related to patient data or a competitive research area, you should maintain the confidentiality of the researcher and not share the details of their project with anyone who does not have a clear need to know the information. If you are in doubt, always ask the researcher and discuss with them the reason why sharing may benefit their analysis. You must immediately report any potential conflict of interest to CCS' Director of Engagement.

## **Develop the researcher and stronger projects will follow**

The goal of the CCS Student Mentors program is not just to reach a solution to the immediate problem that the researcher is facing, but also to develop the researcher towards independence. Our short-term goal is to accelerate their troubleshooting. Our long-term goal is to enable the researcher to ask new questions that they now see as feasible because they have themselves developed the skills to work towards answering them. Therefore, our methodology is meant to enable the researchers to identify their needs, look into what their options are to fulfill their needs and make decisions for themselves. It won't always be the fastest way to an answer, but it is the most sustainable way towards answers for not only their current but also future troubleshooting challenges. We want to ask them questions to get them thinking about why the problem arose in the first place and, in the process, gain a deeper understanding of how the system works. In the bigger picture, this approach can help create a research community in which computational tools and approaches are part of most researchers' everyday life, whether they use them simply to accelerate their wet lab workflows or to do computing-heavy in silico experiments.

In some cases, the researcher may not be interested in fulfilling their role of looking into their options and digging deeper into their problem. At your discretion, you may then offer to connect them to a collaborator who can take on ownership of that analysis and would be a co-author on the paper. The mechanism for making this connection is by sending an email introducing them to CCS' Director of Engagement, and closing that ticket with the note that the researcher was connected to a collaborator to complete the project.

## The skillset of a CCS Student Mentor

One on one mentoring is integral to the success of the CCS Student Mentors program. Putting this into practice requires qualified and trained mentors. You were selected to be a student mentor because of your experience, and because of our confidence in you as somebody who can problem-solve. In addition to those skills, this document is meant to outline some characteristics of a good mentor.

Mentors need to have strong communication skills, both written and oral. The mentor must be well-spoken, easy to understand, clear in their choice of words, speak in appropriate tones and forego use of jargon that won't be familiar to researchers who are new to computational science. Along these lines, mentors need to have good interpersonal skills and be able to interact with a variety of individuals.

The ideal mentor should be organized. With many different tickets accepted over the course of a term, the mentor needs to be able to keep them separate in their minds and in their interactions with the researchers. Writing an email to the wrong researcher not only undermines the credibility of the mentor, but it also violates the confidentiality of that researcher whose project information was sent to the wrong person. The ticketing system should help you with that.

Mentors should be mature, with good follow-up. The CCS Student Mentors program provides a service, and good service requires that we pay close attention to the needs of the population that we serve. This means that we need our mentors to have high standards for following up with researchers, providing them with timely feedback when we say we will, and carrying out our promises to them.

Mentors should have patience and flexibility. We want the researchers to advance quickly, and we are tempted to think that "if only I were doing this... it would move faster," but the pace of progress will be dictated by the researchers, who have competing demands for their time. Mentors might need to repeat a point over two or more consecutive interactions before a researcher truly accepts it and acts on it.

Ideal mentors will be altruistic, willing to give up some of their time for a greater good, but also recognize opportunities for their own growth through the program. Mentors are encouraged to pursue any growth opportunities that may become available through the program, whether those are in the form of networking and relationship building or the further development of their own technical skills.

## **Training a New CCS Student Mentor**

This section, and the training, are under development!

## CCS Student Mentorship Guidelines

Below are our guidelines on the subjects of professionalism, confidentiality, conflicts of interest, and mentoring. Much of this should be intuitive, but we hope you will take the time to carefully review our guidelines, and therefore your responsibilities, and follow them accordingly.

### Your Time

We recognize that you are contributing your time as a mentor on top of a full workload as a graduate student juggling multiple projects and other academic commitments. That said, the researchers who reach out to us need access to you. It is imperative that you commit to the minimum requirements for participation, and also express a willingness to remain available and accessible. The minimum term for a CCS Student Mentor is 1 semester. Although there is nothing that prevents you from being accessible outside normal business hours, if there is any reason why it would be beneficial to interact with a researcher during evenings or weekends you may do so. However, this is not expected nor required.

### Your Responsibilities

You should be mindful to balance honesty and candor with equal measures of mentoring and understanding. Remember that your role is not to discourage, but to entice the researcher to do the work they need to generate an understanding of the troubleshooting process and make their own decisions about their analyses. Unless their request is purely informational, lead them to the resources where they will find their own solutions.

[Placeholder for resources available to you.]

**Professionalism.** Mentors are often peers of the researchers, yet are still role model. As such, it is expected that you will respect the integral role that you play as a Mentor and interact with all participants with the highest degree of professionalism. Setting a professional tone for meetings and interactions with the researchers will likely influence how they regard their projects and the value they place on CCS resources. Attentiveness and respect are some concrete manifestations of professionalism.

**Types and formats of mentoring interactions.** Sometimes it will be easy to answer a question over email, if it regards pointing the researcher towards resources that they need to look into or to publications that may help. In the cases where more substantive mentorship is necessary, you should schedule an in-person or remote meeting with the researcher, to allow for conversation to flow. In some cases, you may need to meet more than once with the researcher as they are progressing through their analysis and new questions come up. There is no official limit to how many meetings you may have with a researcher, however, we would not want you as a CCS Student Mentor to be fulfilling the role of a course in the area of study in

which you are providing mentorship. If you notice that level of engagement with a researcher please let us know so that we can address those needs in a more sustainable way.

***For meetings, encourage timeliness and create an agenda.*** If you notice that it's becoming an issue, firmly communicate timeliness as an expectation of the Program. Address any tardiness issues should they arise and always structure the meeting in accordance with an agenda. Also stick to scheduled ending times for meetings. Allow time for you to record your meeting notes and send out your follow-up communications.

***Claiming ownership for tickets coming into your email inbox.*** Hopefully it will be easy to figure out who of the Student Mentors is able to address each ticket, and therefore who will claim it. If you are not sure whether the ticket was claimed, you can see this by logging into the Request Tracker (RT) system at [rt.ccs.miami.edu](http://rt.ccs.miami.edu).

***Providing mentorship outside the Program.*** If a colleague, fellow student, or other researcher comes to you for help that would fall under the scope of the CCS Student Mentors program, please either ask them to reach you through the CCS Student Mentors email address or create a new ticket for their request in the RT system and process it as you would otherwise. This way we maintain a record of your work, as well as the types of requests that are coming through, which (among other benefits) helps us develop the appropriate trainings.

***Be prepared with inquisitive questions.*** The line between guiding them to discover an a way forward for themselves and becoming engrossed into the science of their project can be blurry. After all, in some cases you may need to understand the problem they are trying to solve to assess the tool that would be the best fit. That should be your guide in forming inquisitive questions for your interactions with the researcher: you are not designing an experiment, rather you are assessing the applicability of a tool/method/approach to the experiment with which the researcher comes to you. Organizationally, you should prepare for meetings by reviewing the notes of previous meetings. In addition, entrepreneurs should also include a list of topics that they would like to discuss at their next meeting.

***Mentoring beyond the scope of your ability.*** In the cases where more than one meeting is necessary, as researchers progress through their project, you may eventually be faced with having to mentor them beyond your scope of ability. In these cases, you may point them to CCS' Director of Engagement who will be able to identify the best avenue for their continued training or a faculty member for collaboration.

***Identify your successor.*** A semester before your tenure as a CCS Student Mentor is over, please start thinking about who from your community has the computational skills and mindset to become your successor.

**Closing the ticket.** Provide the researcher with a short, written evaluation (bullet points are great) of the progress of the request based on errors solved and tasks achieved. CCS' Director of Engagement should be copied on the closing email.

### **Secrets of mentoring**

- **Ask Questions.** We are developing researchers to become adept at identifying the sources of errors, understanding the foundational concepts behind a tool or function and seeking out the answers for themselves. Ideally, we would want them to develop their computational skills to a point where they feel comfortable and confident editing open source code, or creating their own libraries. We can provide them with resources to answer questions, but our mission is to mentor them, not tell them how to run their own experiment.
- **Breaking Out the Whip.** As much as possible, during mentoring meetings, we expect you to assign tasks that require the researcher to make decisions regarding the direction of their analysis. If the request expands to multiple meetings, hold the researcher accountable for reaching certain goals and milestones. We want them to become accustomed to the benefits and consequences of their decisions, and become familiar with the process of troubleshooting in a computational context, which conceptually is actually not that different from the steps they would take in the wet lab experience where they may already be more comfortable.
- **Balance between reading the documentation and talking to a Student Mentor.** You may get requests that are very straightforward and directly answerable from publically available documentation. Researchers may email us without having first reviewed the documentation or looked for past threads on forums. This may be a pet peeve of many in the computational community, however, please keep in mind that the documentation was written by those thoroughly familiar with the given tool, and is not always written to be accessible to someone who does not already have a degree of familiarity with the computational world. Please be mindful of this when responding to these requests. This is not to say don't point them to the documentation, just that in some cases you may need to translate the documentation into terms that they can understand. In the remainder of cases where a researcher is able to understand easily available public documentation but is not doing so, it is okay to send them back into it, and only address any remaining questions they may have after they do that.
- **Communicate!** Your ability to communicate quickly and effectively with the researcher you are mentoring will be a determining factor in the development of a solution. Take notes during your meetings, send your meeting summary and recommendations promptly, and respond to contact from the researcher in reasonable periods of time.