Best Work #3:
Selected Materials from Math 6001, Introduction to Graduate Mathematics

Responsible Conduct of Research (RCR), Overview

Online Training!

Despite our in-person course that includes RCR, you must do an online portion within 90 days of beginning graduate school. Once you have done it, please send me an email to let me know.

Here is the online training site.

"If you completed the CITI RCR course while attending another institution, credit for the modules that you completed should transfer over if they are the same modules that Georgia Tech uses. You will need to log in, match your account if needed, and complete any additional modules that Georgia Tech requires."

Check out this document for instructions.

Online training, continued

The online training should take 3-5 hours to complete.

There is a CITI account affiliation with the training. Hopefully this is linked automatically by Georgia Tech. If it is not, then you may have to create an account.

Peer Review

- Being a referee or grant proposal reviewer can lead to ethical questions.
- Does being an expert in a field and knowing the author lead to a conflict of interest?
- Did each author make a "significant intellectual contribution" to the work?
- Did the author(s) plagiarize?

Specific to math:

- How much responsibility do you have as a referee to point out mistakes?
- Do math journal editors typically disclose a potential conflict of interest when refereeing a paper?
- What happens if a paper has a mistake discovered after publication? See Retraction Watch.

Science and Engineering in Society

- We should present our research in "an honest, sincere, complete, and competent way."
- Transparency in disclosing conflicts of interest (funding sources, personal relationships with committees or panels).
- Do not use grants for your own personal benefit.
- From Georgia Tech's site:
  "As the fundamental canon of engineering codes of ethics states, it is vital that 'the safety, health, and welfare of the public' is upheld in professional practice and in research activities."
- We want society to trust us.

Authorship and Publication

- All authors should make a "significant intellectual contribution."

- All authors are responsible for truth of content.

- According to the GT RCR site, researchers are discouraged from splitting up work into multiple publications. What do you think?

- If you have financial conflicts of interest with a journal, committee, etc., you should disclose them.

- I've published a paper. Can I put my personal PDF journal offprint on my website?

Collaborative Research

- Power dynamic can be awkward. How do you prevent bullying or work being compromised?
- All participants' concerns should be heard before moving forward to publication stage.
- Large collaborative projects: how can you verify the work of everyone else in the project? It could be a worldwide effort, and might build on results of others.

  Math quasi-example: Classification of finite simple groups. Thousands of pages over many journals, sometimes with results building off of different authors' previous results.

Data Management

- Who is the true owner of a set of data?
- Ethical and reasonable collection of data.
- Are your findings reproducible?
- If you have access to proprietary data, you must be careful to whom you reveal the data.

  Math quasi-example: You shouldn't publicly post books (or proprietary material within books) publicly on the internet.

  Academic example: Theoretically, using a third-party email rather than your GT mail to discuss anything related to your students can be seen as a violation of FERPA.

Responsibilities of Mentors and Trainees

- How do we create a truly collegial atmosphere?
- Discrimination and its ramifications.
- How to address situations in which the mentor behaves in an improper manner.
- Mentors need to respect trainees, and vice versa.
- Clarity of research expectations, and timetable.
- Constructive criticism vs. personal attacks.

Academic example: Women and minority groups were historically discouraged, or sometimes even banned, from pursuing academic studies or attaining high rank.

Research Misconduct

- Plagiarism, fabrication, and falsification.
  (U.S. federal designation)

- According to the Federal Policy on Research Misconduct:
  1. "Plagiarism is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit." Can plagiarize yourself!

  2. "Fabrication is making up data or results and recording or reporting them."

  3. "Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record."

- Letting ambition, personal conflict, etc., get in the way.
- Huge gray area.

Conflict of Interest

- Vast array of possibilities.

- One GT scenario: Researcher owns stock in a company, does research on a topic that may benefit or hurt company's interests.

- Grant reviewer feels bias (or worries of subconscious bias) towards a grant applicant.

- Some inevitable things are a natural conflict of interest, but in an almost completely transparent way (advisor writing letter of recommendation for an advisee).

Human Subjects Research

Three major principles from the Belmont Report:

1. Respect for persons. Need to respect their ability to make their own decisions and to protect those who are vulnerable.

2. Beneficence, partly the "do no harm" principle.

3. Justice, and fairness to all subjects.

Other RCR material which is not covered in Math 6001

1. Environmental and Laboratory Safety

2. Humane Use and Care of Vertebrate Animals in Research

RCR peer review (some related material)

The Tai Model of integration

See these three links:
link 1   link 2   link 3

In the 1994 article "A mathematical model for the determination of total area under glucose tolerance and other metabolic curves" (Diabetes Care, Vol 17, Issue 2 152-154) Dr. M.M. Tai discovered that you can estimate areas under curves using **trapezoids**.

Dr. Tai called this "Tai's Model" and got (according to blog post) over 75 (or over 200, according to the stackexchange link) citations.

What would you do if you were on the journal editorial board and this method was discovered just to be the trapezoidal rule?

Alan Sokal pulls a hoax

In "Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity," NYU physicist Sokal wrote an article relating physics and philosophy. He has posted it here.

It was published in *Social Text*, which is a postmodern journal.

In the words of Sokal himself, the article: "is a melange of truths, half-truths, quarter-truths, falsehoods, non sequiturs, and syntactically correct sentences that have no meaning whatsoever." (as quoted in "Beyond the Hoax by Alan Sokal" by Nicholas Lezard in this Guardian article in 2010)

What would you do if you were *Social Text*?

For a case in peer-reviewed scientific journals, check out the Bogdanov affair.

Non peer reviewed journals

A paper consisting entirely of the phrase

"Get me off your f***ing mailing list"

was accepted by the International Journal of Advanced Computer Technology.

RCR: Math in Society

Some things to keep in mind

1. Our research and teaching as they affect us as students and faculty.
2. What society thinks our purpose is (as academics).
3. Connection between academics and the university as a whole.
4. The public good.
5. How society interprets our research.
6. How future generations will use our research.

You represent the institution

Academic scandals can have a large ripple effect on the university, its supporters, and even the local economy.

One ongoing investigation concerns the University of Louisville Foundation, which has been under scrutiny since June 2017.

I should note that this investigation is, to my knowledge, currently completely unresolved.

Engineering and the public good

Cost-benefit analysis comparing human lives and engineering costs resulted in the "Pinto memo" at the Ford motor company.

A cost on Ford's end of $11 per car was judged against the cost of human life resulting from certain accidents. The full document is here.

In "The Myth of the Ford Pinto Case", Gary T. Schwartz writes: "the case shows how disturbed the public can be by corporate decisions that balance life and safety against monetary cost." (*Rutgers Law Review*, Vol 43:1013)

Self-driving cars

Two human-driven cars make a bad mistake that will result in a car accident involving a third self-driven car with one occupant.

The self-driven car can either:
1. choose an accident which minimizes overall damage but may result in the death of its "driver" or

2. choose to keep its driver safe, but possibly result in the deaths of all passengers in the two human-driven cars.

What should the car do? How would you program this car to "minimize negative consequences"?

Others using your research

Opinions differ on the extent to which a researcher is responsible for future implications.

How do you feel about the following article, which claims that:
"Scientists are responsible for both the impacts they intend and some of the impacts they do not intend, if they are readily foreseeable in specific detail."

What about science research that has immediate uses for good (biological understanding of cells, pathogens, etc.) but which could also be used for ill purposes?

Others using your research, continued

Louis Fieser, while at Harvard, spearheaded the invention of napalm. He is quoted in *Time* (Jan. 5, 1968) as saying,
"I have no right to judge the morality of Napalm just because I invented it."

In *Good Will Hunting*, Matt Damon's character decides against working for the NSA out of fear his code-breaking skills will be used for ill rather than good.

Keeping the record accurate

The "Climategate" scandal erupted after hacked emails of scientists seemed to indicate possible suppression of data that would go against global warming.

The scientists defended themselves by pointing out that the statements in those emails had been widely taken out of context.

One takeaway: Email exchanges meant to be private or only shared by experts may someday become part of the public record.

Sometimes you just can't win

There is always a chance that your work will be misrepresented on a large scale, completely through no fault of your own, and with no way of preventing it.

Example: The largest prime number has been found!

RCR: Authorship and Publication

Who gets to be an author?

- Only those who have made "significant scientific contributions" should be authors.

- Mathematics: authors generally listed in alphabetical order, rather than primary vs. secondary authors.

- All authors should see the final version! Submitting author is responsible for this.

- From the Georgia Tech RCR slide #6: some medical journals require paper work detailing aspects of authorship, and specifying contributions. I have never seen such a thing in mathematics journals.

- Acknowledgments section offers a way to give credit to contributors who do not qualify as authors.

General authorship considerations

These may be very concrete in general science.

- Who came up with idea for problem or experiment
- Details for implementing experiment
- Who conducted interviews, chose test subjects, etc.

In mathematics, these are not so easy to determine. Often, collaboration is clear from the start of the problem, or a common sense judgment call is made.

Copyright

Some science journals will not publish material that they deem to be already published or in review. This can be deemed to include material made public on the internet.

However, mathematicians frequently publish on the arxiv before submitting papers to journals, and this does not seem to be a problem.

You should not post a PDF offprint of the *actual journal article* PDF on your personal website. You can link to the mathscinet page, or to the arxiv version, but the official PDF offprint given to you by the journal (and theoretically hidden behind a paywall to non-subcribers) should not be made public.

Re-using results

Be clear regarding which results of your own are old (cite references) and new.

Publishing specific data can be a very sensitive issue.

Redundant publications can get you into trouble, even if they are completely unintended and accidental.

Retractionwatch.com has many articles about dual publication issues that have led to retractions, and in some cases, revoked PhD theses.

Ghost authorship

There have been cases of the following:

1. Someone working for a company writes an article, then
2. Gets a professor to sign on as an author, then
3. Put that professor as the only author of the study.

In this way, a company could promote its own products or research while making it appear that an academic did the work.

Even if the professor truly agrees with the research, having them listed as the sole author is misleading. See here for an example.

RCR: plagiarism and self-plagiarism

Plagiarism outside academia

Almost natural to think of plagiarism as a purely academic phenomenon, but it happens quite frequently outside of it.

This article from *Plagiarism Today* details 5 scandals that happened in just 20 days of 2016.

See here for a discussion of the difference between plagiarism and copyright infringement.

In the world of tabletop miniatures gaming, giant Games Workshop sued Chapterhouse over the use of the term "space marine."

Plagiarism in TV

You can find plagiarism within the plot of a fictional TV show.

In *The Squid and the Whale*, a character plays Pink Floyd's "Hey You" as if he had written it, and it takes surprisingly long for anyone to figure it out (after he has won a prize!).

One possible moral: in the least egregious cases of plagiarism, it is best to fix the record early.

Self-plagiarism

Creedence Clearwater Revival leader John Fogerty was sued for plagiarizing himself.

For someone, his 1985 song "The Old Man Down the Road" was apparently too similar to CCR's "Run Through the Jungle." Fogerty prevailed in court.

Sociologist Zygmunt Bauman was accused of self-plagiarism in his books, in the form of lifting passages from his previous books without proper citation.

When it doubt, cite it out

Why not err on the side of caution?

The RCR slides have links to GT resources.

Things like turnitin and iThenticate are used more commonly these days, not just for detecting plagiarism for the purpose of prosecuting cheating, but also as a self-test to detect anything that could be construed as plagiarism.

RCR: Collaborative research

Mentors for graduate students and beyond

- You are encouraged to look for mentoring beyond your (future) PhD advisor.
  1. Variety of perspectives
  2. May feel more comfortable discussing certain topics
  3. Can help keep issues separate
- Example: GT mentoring for postdocs.
  1. They choose or are given a research mentor on arrival at GT.
  2. 1st year, teaching: mentored by ADOTE and course coordinators.
  3. 2nd year and beyond: choose a teaching mentor from tenure-track or tenured faculty.
  4. Wide range of perspectives and possibilities for working together.
- Even from a purely Machiavellian standpoint: more networking possibilities, more possible letters of recommendation.

Grad student perspective: collaborating with mentors

Does more mentoring and training you get better results than nothing?

Long story short: Yes and no.

The study "What do mentoring and training in the responsible conduct of research have to do with scientists' misbehavior?" (by Anderson, Horn, Risbey, Ronning, De Vries, Martinson, in *Acad Med.* 2007 Sep; 82(9):853-60) investigates this question and finds that some components of training seem to have a positive effect, while some forms have a negative effect!

You can find the details in the link.

Power dynamic in collaboration

- Sometimes, a lead researcher or tenured professor may not realize the strain they are putting on a graduate student.
- What happens if you are asked to perform a task and you feel you can't refuse?
- For example, see this hypothetical scenario.
- One way to avoid such things: Set a clear understanding of tasks before writing tasks get going.

EthicsPoint

GT works with EthicsPoint to allow anonymous reports of a wide range of misbehavior including all research-related matters.

RCR conflict of interest

Kinds of conflict of interest

The RCR slides have the following link to the Monash University website "Examples of Conflicts of Interest and Guidelines for Action" which lists a large number of conflicts of interest, such as:

1. Financial interests
2. Personal interests, including relationships between those who are judging work for exams, grants, etc.
3. Outside duties that prevent an individual from being able to do their job adequately.
4. Outside work that ethically, legally, or otherwise conflicts with the terms of your job.

Georgia Tech policy

Online, you can find Georgia Tech's "Conflict of Interest and Outside Professional Activity Policy" (policy 5.6).

- Doing consulting work is allowed as long as you perform all steps for prior approval and the work does not present a conflict of interest.

- The GT policy states: "Full-time Institute Employees may not be on the payroll of other organizations except as a consultant. (Payment for services must be reported on an IRS 1099 Form, not on a W-2 form.)"

  However, GT policy allows some activities outside of work, either because they are service activities or are considered part of an employee's private life (see the link above for details).
  1. Publication
  2. Professional service
  3. Moonlighting

Some recent cases

In 2014, three Georgia Tech employees were fired as a result of an investigation into research misconduct which included conflict of interest.

Dan Markingson's suicide and the subsequent controversy have led to continual discussion about medical research ethics and conflicts of interest.

Other conflicts of interest

Nepotism is unethical and against the rules.

The University System of Georgia has a policy for outside activities (see section 8.2.15).

Section 8.2.15.1 of the Board of Regents Policy Manual states: "Professional employees are encouraged to participate in professional activity that does not interfere with the regular and punctual discharge of official duties provided the activity meets one of the following criteria:

1. It is a means of personal professional development;
2. It serves the community, state or nation; or,
3. It is consistent with the objectives of the institution."

One example: you cannot hold public office as an employee of GT.

Avoiding conflict of interest

Georgia Tech has a Conflict of Interest Management Office to address questions and avoid problems with conflicts of interest.

Your advisor or other faculty mentors may have experiences managing conflicts of interest with their academic research and positions of service.

RCR: Data management

Peers can prevent disaster

Collecting and sharing data together with collaborators can correct problems before it is too late.

- We may subconsciously be avoiding data that does not fit our desire.
- Perhaps we make an honest mistake that will skew data badly.

One particular quote:

"He was intentionally cutting corners in a way that would bias the data, but I decided to play dumb. I told him that I was puzzled about his method and that I had learned to do it a different way. I then added a little flattery: 'You do such important work, I would hate to see anyone criticize it.' He had to admit that I was right." (G. Koocher and P. Keith-Spiegel, "Peers nip misconduct in the bud," *Nature* **46** 438-440 (2010))

Transparency can help

The Theranos scandal has made many news headlines since 2015, with articles in the Wall Street Journal, CNN, and Vanity Fair.

One central complaint about its research was that "...no scientist could credibly vouch for Theranos. Under Holmes's direction, the secretive company had barred other scientists from writing peer-review papers on its technology" (Nick Botlon, "Exclusive: How Elizabeth Holmes's
House of Cards Came Tumbling Down", *Vanity Fair*, October 2016).

For an example of when refusal to share goes wrong, see this article by Andrew Gelman.

Ethics in data collection

Is it ethical
to use data that has been collected in an unethical or illegal manner?

Is it ethical or legal to hoard data?

Individuals and companies can impose restrictions on release of data. See the controversy surrounding BP and oil spill data.

Endless data collection

The internet, Siri, Cortana, Alexa, Facebook, etc. Much of our data is out there voluntarily, for the taking.

The Council for Big Data, Ethics, and Society has a website with links to many related articles, such as:

- The right to be forgotten
- Tracking in social media, such as twitter
- Ethics in big data

Theories abound on the internet about the spying of Siri et al. If you type "alexa's answer if she is spying" into Google, you may find some interesting things.

RCR: Responsibilities of Mentors and Trainees

Power dynamic problems

- Sometimes, a lead researcher or tenured professor may not realize the strain they are putting on a graduate student.

- Graduate students and postdocs may feel like they cannot refuse a request from an advisor, since letters of recommendation and approval are crucial.

- For example, see this hypothetical scenario.

- Possible ways to avoid such problems
  1. Set responsibilities and deadlines for collaboration right away.
  2. Discuss the issue with your advisor or mentor if it becomes a problem. For example, a TA who felt overworked decided to talk to their instructor about how much time they were spending on the course. The instructor felt terrible, and had no idea this was the case.

Discussing mentors and mentees

- How appropriate is it to discuss advisors or advisees with others? How do you do this professionally?

- Except when absolutely necessary, refrain from personal attacks. Even if you are joking and mean no harm, it can be very damaging.

  Example: when I was a grad student, one of my fellow grad students said something like this on prospective students day:

  "First year, you'll find yourself with some ridiculous homework in Prof X's class, but he'll just laugh at you with no remorse because that's how Prof X is."

  The prospective student was moving about halfway across the planet specifically to work with Professor X.

Sometimes we cringe

Remember who might be reading the letters you write.

Example, In a professor's letter of recommendation for a tenure-track candidate: "This mathematician is good. Better than John Smith, but not as good as Jane Williams."

As it turns out, that young faculty member was applying to the departments where John Smith and Jane Williams worked, and both of them read this recommendation. One of them in particular felt very awkward.

Harassment and Discrimination

The STEM fields have a long history of sexual harassment. You can find a list of articles and cases here.

See the statement by the Association for Women in Mathematics regarding sexual harassment.

Gender discrimination is well-documented historically, in the United States and abroad, as is racial discrimination.

See GT's policies on harassment and discrimination, and the student sexual misconduct page.

See also the end of the following faculty and staff guide for contact numbers and information.

Georgia Tech offers implicit bias training for faculty. Grad students are active on the diversity council.

Reporting inappropriate behavior

Georgia Tech's Title IX page gives sources for reporting sexual sexual harassment and bullying.

In particular, you may report behavior by filing a Title IX complaint.

If you have experienced sexual violence, you may find confidential help at VOICE.

See the VOICE website for more information, including contact information.

Reporting discrimination and retaliation

From Georgia Tech's policy:

"Complaints against non-faculty employees should be reported to Georgia Tech Human Resources Employee Relations or (404-894-4847).

Complaints against a faculty member should be filed with the Associate Vice Provost for Advocacy and Conflict Resolution in the Office of the Provost.

Complaints against a student should be filed with the Office of the Dean of Students or by filing an incident report with the Office of Student Integrity."

EthicsPoint

GT works with EthicsPoint to allow anonymous reports of a wide range of misbehavior, including research, sexual misconduct, harassment, and discrimination.

RCR research misconduct

Plagiarism and general citation failure

Plagiarism is perhaps the most common type of major academic misconduct.

We devoted an RCR session to plagiarism and self-plagiarism.

When in doubt, cite it out! If writing a formal paper, it can never hurt to reference a resource that you use, and you must use quotation marks when quoting.

Fabrication

- Yoshihiro Sato faked data about drug treatments, with this misleading data affecting future decisions for clinical trials.

- Anil Potti's scandal for fabricating data in cancer research.

- Dipak Das's red wine scandal involving fabrication and falsification.

- Harvard psychologist Marc Hauser fired for fabricating data.

Falsification

When results aren't fabricated out of thin air, but they are exaggerated to look good.

- An Iowa State professor who falsified results that helped generate millions in funding received years of jail time!

- Some famous examples in journalism: Stephen Glass (The New Republic), Jayson Blair (The New York Times).

- Recent and unresolved example: Kevin Deutsch, author of recent book *Pill City*. The book's veracity has come into question, as has his previous journalism.

Discovering research misconduct

You can find Georgia Tech's research policies here.

1. Approach the offender professionally, and break it to them gently (remember the article from our data RCR)

2. Georgia Tech has an ombuds program for resolving conflicts, as well as our previously-featured Ethics point.

3. If these fail or are inappropriate, you may become a whistleblower. Some big names have been brought down in this fashion, including Diederick Stapel (see here).

4. If you witness research misconduct beyond a preliminary stage, you are obligated to report it to Georgia Tech to the office of the Provost or the Vice Provost for Research.

Some Questions to Ponder for Research Misconduct

1. What are Georgia Tech resources and other human resources you can use to do the following?

   (a) Prevent potential misconduct before it occurs.

   (b) Destroy possible misconduct by a collaborator (peer or senior) in the pre-publication research stage.

   (c) Report misconduct in the pre-publication stage if the collaborator is not receptive to your suggestions.

   (d) Report potential misconduct in a published article.

<u>Human Subjects</u>

1. You take part in an experiment in which you are given orders by an expert to administer voltage to a test subject (a human you do not know). You sit on one side of a wall with the expert, and the subject lies down on the other. The buzzes have 10 levels rated from "tiny buzz" to "shock" to "XXX" and finally "Skull and Crossbones".

   How many buttons are you willing to press when the expert calmly insists you do so?

   This is similar to the famous Milgram Shock Experiment (1963). What do you think the purpose of the study was?

   What do you think was the percentage of volunteers who went all the day to the end?

2. You seek to study the effects of lead poisoning on children, and part of this involves moving families away from areas of high lead contamination. However, logistical and money constraints prevent you from moving many of the families to lead-free households, so you must instead send them to only lead-remediated (slightly contaminated) houses. Without your assurances that these new houses are lead-free, the families won't move.

   Would you consider lying to the families?

3. You are developing an online-learning program with interactive videos. You have made two different videos for the same subject: Linearization.

   One video is almost entirely geometric. The other video is almost entirely algebraic.

   Is it ethical to randomize these two videos among students taking the online course, in order to study what technique works better in the long run?

4. The case of Three Identical Strangers(made into a documentary in 2018). Unknown to any parents, an adoption agency and a psychologist separated identical triplets at a young age and gave them to families living in close proximity in New York.

   They monitored these triplets to study nature vs. nurture, habits, etc.

   The secret unraveled when one of the triplets just happened to go to the same school as another, and found that many students he had never met seemed to recognize him.

Some Peer Review Questions to Ponder

1. Do you think non-peer reviewed journals should even exist? Would you consider publishing an expository article in a non-peer reviewed journal?

2. You are asked to referee a 20-page math research paper in your field. What should you communicate to the journal editor before agreeing to be the referee?

3. What do you think are the main causes of conflicts of interest in peer review in the math world?

4. You are a journal editor and a paper in the journal has been found to have an error. What is the procedure?

- Should you retract the paper?

- How much detail should you provide in the retraction notice (this notice will appear as an entry in MathSciNet)?

- Do retracted papers still remain available indefinitely through the journal?

For an example, see Elsevier's policy for article withdrawal:

https://www.elsevier.com/about/policies/article-withdrawal

Some Math in Society Questions to Ponder

1. What ethical challenges do we face in academic mathematics research, or do you think we don't face any? How does our research affect the public at large?

2. In a private email to collaborators, you recommend doing the "Whitney trick" to help solve a math problem. Later in the email, you are tempted to make an unrelated side comment that involves politics. You absolutely trust your collaborators and you know they will understand and agree with your comment on politics. Is this a bad idea? What could go wrong?

3. How much are tech companies ultimately responsible for the indirect consequences of their products? For example, propaganda, toxic dialogue on social media, and internet bullying.

Some Authorship Questions to Ponder

1. A mentor asks if you have thought about a particular research problem in your field, and gives you a related paper to read. You discuss collaborating to solve the problem. However, in a sequence of moments of pure genius, you solve the problem by yourself, when you have barely discussed any research progress with your mentor.

   What do you do? Do you put your mentor's name on the resulting paper? Do you just use the acknowledgments? Do you say "sorry" and burn a bridge?

2. You're working on a problem in Subject X, and you consult one of the leaders in the subject about your problem. They say they are willing to talk to you and even work a bit with you on the research, but before any of this starts, they make it clear that whatever this thing entails, they want their name on any paper that results from the research.

   What do you do?

3. You submit a paper to a journal. Three months later, you hear back from an editor: around the same time you submitted your paper, a different author submitted a slightly-weaker but nearly identical result to the same journal!

   The journal editor doesn't want to publish both papers, especially since one is weaker. They suggest that you and the other author somehow consolidate your papers into one paper and put it in the journal as a co-authored paper. What do you do?

4. You finish your PhD thesis, defend it successfully, and proudly desire to put the PDF of your full dissertation on your personal website. What should you do?

<u>Some Plagiarism Questions to Ponder</u>

1. You are the editor of a math journal, and a referee notifies you that a submitted paper seems to indicate that some unoriginal work is original. In the least, results specific to the field are stated without proper citations or names.

   What do you do as editor? Require revisions to clean up the sloppiness? Reject it outright? Do you go even further?

   What if you don't discover this information until after the paper has been published?

2. You are the distinguished author of a graduate text in Subject X. Aside of references from other authors, you have countless papers of your own! These have .tex files ready for copy and paste with your results and your intuitive summaries of your own work.

   How do you use your material when writing the book?

3. You announce a result at a conference and state its imminent appearance on the arxiv.

   Five days later, while you are preparing to put your paper on the arxiv, you get your arxiv daily notification and see that the result you stated has been proved sloppily in a brand-new paper by a different author, with techniques somewhat similar to yours.

   What do you do?

Some Questions to Ponder for Collaboration and Advising

1. You and two collaborators are writing a paper, with no established agreement for when the paper should be finished and submitted. There are some results that are your responsibility to write.

    You had a conference last week and are traveling for a workshop the next two weeks, and a collaborator is on your case for not finishing the work. How do you handle the situation?

2. You and three other collaborators have divided the paper-writing into sections, and it is time to compile the first draft. At this time, you discover that the most senior collaborator has barely begun their part of the paper. You are on the job market and were counting on having this paper on the arxiv around this time.

    What do you do?
    What steps could you have taken (if any) to avoid this?

3. Without seeing any results: do you think there is a correlation between mentoring and training for ethics in academia vs. absence of misconduct?

4. You are in your fourth year as a PhD student, and have a good relationship with your advisor. You are teaching your first class, differential calculus. You are concerned that your first exam is too hard and too long, and you question how strongly to enforce the missed-work policy.

   Should your advisor be the top person to ask on your list? Who else can you talk to for teaching-related advice?

Some Questions to Ponder for Data Management

1. You and a collaborator have collected data in a pre-publication stage. You discover that they collected a huge amount of data, but they only showed you small amount of it, and it happens to support your hypothesis.

   How should you proceed?

2. You are a bit suspicious about published research that seems to indicate an implausible link, or one which would suffer from many possible confounding factors.

   You ask the authors if they will share their data, and they say no. What do you do?

3. Would you consider using an app that projects what you will look like as you age?

   FaceApp has over 86 million downloads.

   AgingBooth was downloaded over 2 million times in one week of 2019.

Some Questions to Ponder for Responsibilities of Mentors and Trainees

1. You are a TA for two lectures of one course, for an instructor whose studios and grading responsibilities require you to put in much more effort than your fellow grad students do as TAs for other instructors.

   What might you do?

2. What are the standards of conduct in our student offices?

3. How can you report inappropriate behavior and harrassment?

4. You are now a tenured professor, and you are writing a letter of recommendation for a graduate student who is about to go on the job market. Is it appropriate to compare that student to other members of the field in your letter?