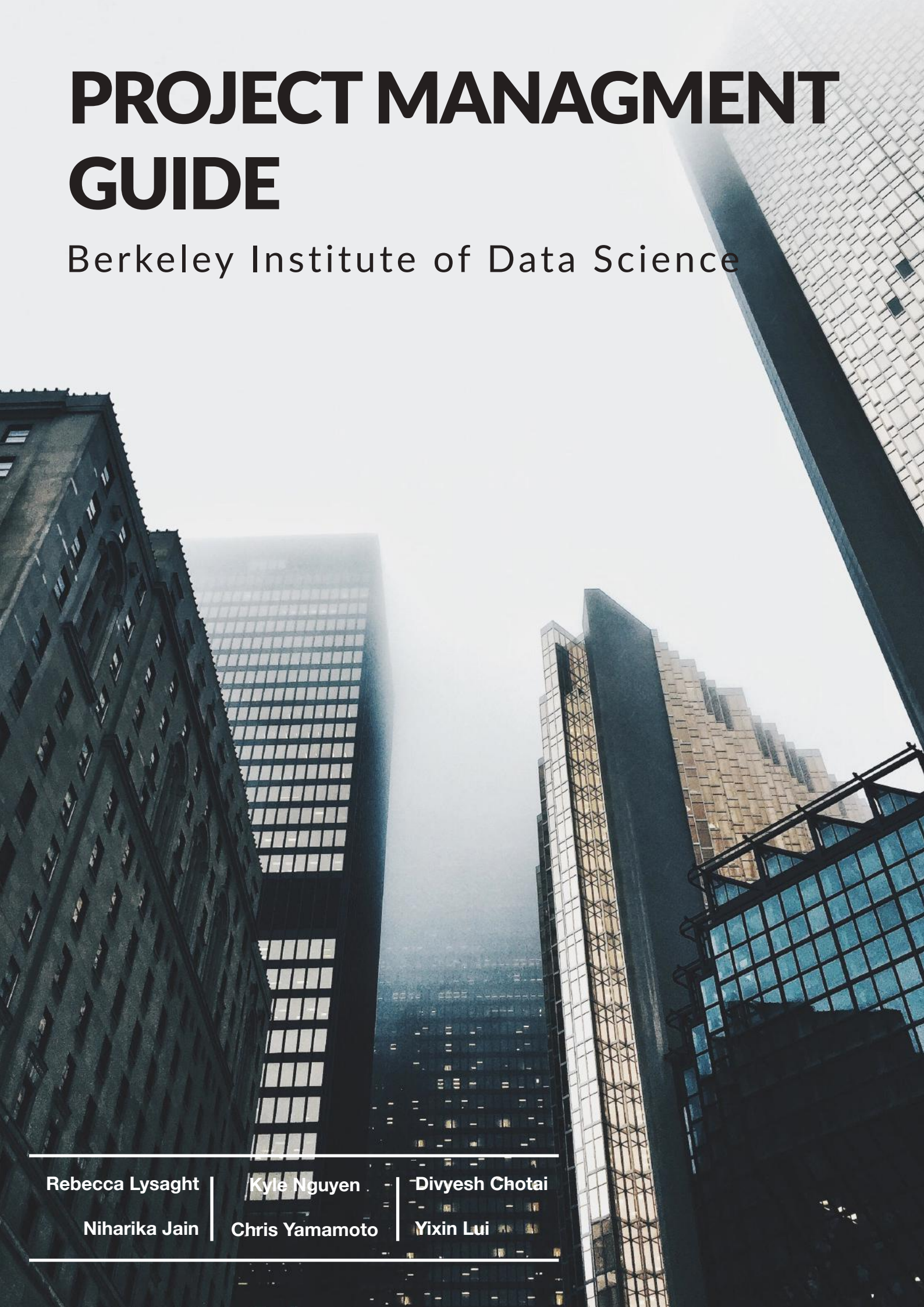
PROJECT MANAGMENT GUIDE

Berkeley Institute of Data Science



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STARTING OUT

Before you begin you proect, it is imperative that you make sure that you are ready to handle the intricacies that comes with managing a project. There are some important questions to ask yourself when you are starting out your project. Here are some key things you need to think about before commiting to your research project:

- Is this your first time working on research with undergraduates? Leading a research team?
- How much time can you spend managing a team every week? This involves one-on-one meetings, team meetings, putting together assignments, reveiwing work, and giving feedback.
- How clearly can you define the research tasks that you will assign to your team? Will you have technical Leaders?
- What is the scope of work? Do you have a timetable ready?
- How well do you understand the technical aspects of your project? Will you be doing more teaching or learning?
- How many semesters do you plan on working with a research team?

You might not have answers to all of these questions; that's ok. You and your team will evolve over time. The first semester will be the messiest, but you will learn what works for you and your mentees and make adjustments. Each new semester will be an iterative improvement over the last. Note that URAP may not be the best support for rapid, immediate progress!

MAKING IT LIVE

Think you're ready to start your project now? Then let's take it live! You'll have to work to get your project listed. Right now, URAP is the official procedure on campus for projects to be listed. To recruit research assistants, you will need to set up a project listing on URAP. This section of the guide will help you dig deeper into important considerations you need to make before you make your URSP proejct listing live!

1 PLANNING

The first thing to have ready is the general description about the research. This will help potential candidates have a basic understanding about the research. This will also help potential candidates to determine whether they are a fit. The goal of the project description is to capture the essence of the research being conducted.

2
TIMELINE

Having a timeline is incredibly helpful at the beginning. It's important tool because it can serve as a tool to check whether the research is running as intended. Separate the projects into several parts based on priority. Thus sort the tasks and build the timeline according to importance. It will give the project focus and help the recruits feel a lot less overwhlemed from the beginning, which will really affect their mindset going in. Remember to take into account midterm periods during the semester to reduce the work during those weeks. In addition to this, set project goals for each week or each two week to accomplish in the timeline that the progress can be checked during the meeting. This will help keep the research assitants accountable as they will anticpate what is expect of them.

3
RECRUITMENT

It seems natural to just try to find the best candidates possible, but there are times where you won't think any one available is a fit. To mitigate this, we recommend for you to separate the projects into several different parts, particularly on skill. It will be more efficient to split up the project into separate pieces in advance before recruitment starts. From these pieces, you will be able to determine the skill levels and number of research assistants you will need. These separate parts will be a more accurate indicator of the skills you need and will allow you more flexibility to adjust to the available recruitment pool.

On the next two pages, we have a sample posts that will give you a good sense of what will be expected in a good project posting

Heather Haveman, Professor
Web-Scraping | Text Parsing| Machine Learning

Open. Apprentices needed for the spring semester. Please do NOT contact faculty before February 8th (the start of the 4th week of classes)! Enter your application on the web beginning Tuesday, January 12th. The deadline to apply is Tuesday, January 26th at 8 AM.

For this project URAP apprentices will develop code in order to collect and clean data for a variety of research projects. Apprentices will apply their programming skills to scrape product data from publicly available websites and to turn messy unstructured data sets into shiny clean data sets available for reproducible research.

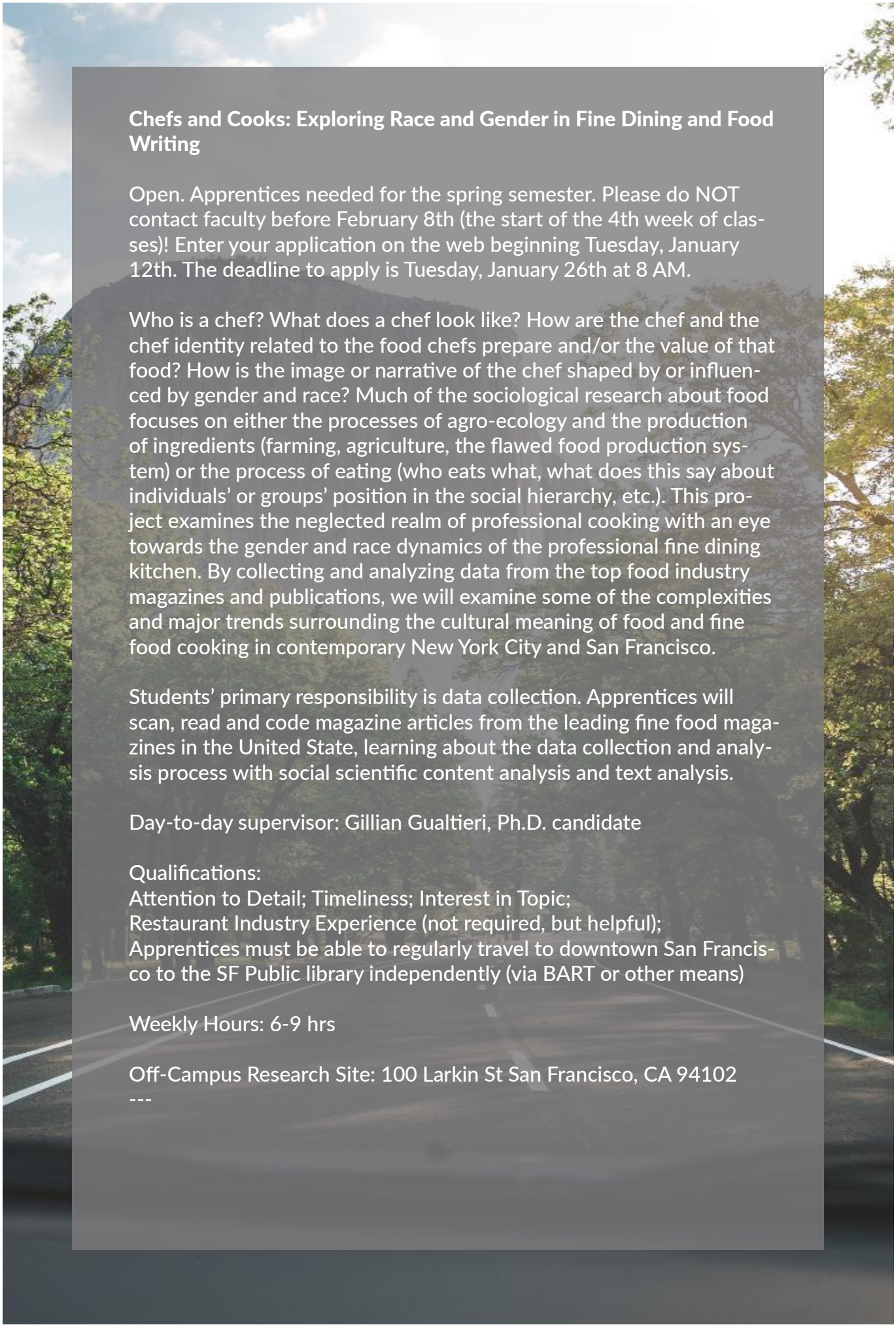
Participants will scrape data on a number of markets and phenomena. They will also develop code to analyze the discourse surrounding these markets as found in electronic forums visited by market participants and articles published in the mainstream and specialized press. Students will work with machine learning packages for text analysis to help analyze the millions of observations collected via our web scrapers.

You can find more about our research projects here: http://www.oski-lab.com.
Cyrus Dioun and Gillian Gualtieri will be the day-to-day contacts to field questions, trouble-shoot problems and address everyday issues. Undergraduates that are proficient in programming languages and statistics will help us collect, clean, and analyze large data sets.

Day-to-day supervisor for this project: Cyrus Dioun & Gillian Gualtieri

Qualifications:
Proficiency with one or more of the following:
Coding(Python, Java, C++);
Cloud Computing (Amazon Web Services - EC2, S3, Glacier);
Machine Leaning (SciKit Learn/Matlab/Octave);
Cluster Computing (Hadoop/MapReduce/Spark/BDAS);
Large online databases(MySQL, NOSQL);
Data Visualization (Shiny, D3)

Weekly Hours: to be negotiated



Chefs and Cooks: Exploring Race and Gender in Fine Dining and Food Writing

Open. Apprentices needed for the spring semester. Please do NOT contact faculty before February 8th (the start of the 4th week of classes)! Enter your application on the web beginning Tuesday, January 12th. The deadline to apply is Tuesday, January 26th at 8 AM.

Who is a chef? What does a chef look like? How are the chef and the chef identity related to the food chefs prepare and/or the value of that food? How is the image or narrative of the chef shaped by or influenced by gender and race? Much of the sociological research about food focuses on either the processes of agro-ecology and the production of ingredients (farming, agriculture, the flawed food production system) or the process of eating (who eats what, what does this say about individuals' or groups' position in the social hierarchy, etc.). This project examines the neglected realm of professional cooking with an eye towards the gender and race dynamics of the professional fine dining kitchen. By collecting and analyzing data from the top food industry magazines and publications, we will examine some of the complexities and major trends surrounding the cultural meaning of food and fine food cooking in contemporary New York City and San Francisco.

Students' primary responsibility is data collection. Apprentices will scan, read and code magazine articles from the leading fine food magazines in the United State, learning about the data collection and analysis process with social scientific content analysis and text analysis.

Day-to-day supervisor: Gillian Gualtieri, Ph.D. candidate

Qualifications:
Attention to Detail; Timeliness; Interest in Topic;
Restaurant Industry Experience (not required, but helpful);
Apprentices must be able to regularly travel to downtown San Francisco to the SF Public library independently (via BART or other means)

Weekly Hours: 6-9 hrs

Off-Campus Research Site: 100 Larkin St San Francisco, CA 94102

FINDING THE RIGHT TEAM

Recruitment is a very important part of managing a team. Your team often is your strongest asset. It is important to have a strong team with members that really have useful skills and talents to contribute to the project as a whole and help bring the endeavor forward. Finding talent to join your team can be hard, but it doesn't have to. We begin by taking a look at the factors to consider when screnning a candidate and then transition to interview techniques.

SKILL FIT

It is important to make sure the people that you choose have a skill fit. Once you know these certain skills, make sure you find people who have experience in these fields so that they can start right away and you won't have to spend much time familiarizing them with the tasks you need done. However, be realistic with your expectations. If a candidate has one of the two skills needed, be open to taking them especially if they show potential. You can easily build a team by having complimentary assistants that fill each other's weaknesses.

POTENTIAL

When it comes to research, you're going to be working with many ambitious, bright students. Many of them will want to learn from you and look up to you as a mentor. Since you're going to be spending a long time with this person, take a look at their long term prospects. If they show a lot of aptitude, look to recruit them for your team to tap into their potential and help them grow. Chances are your investment will return signficant dividends towards your project.

TIME COMMITMENTS

Check their time commitments for the semester — does this candidate even have time to put into your project? You want to make sure that they are willing to put the time that you need for your project and can commit the time for meetings and work sessions. It will be important to be sure that they are dedicated. You don't want to waste your time with people who are going to leave the project mid semester, wasting everyone's time.

THE INTERVIEW

Oh the dreaded interview. There's a reason why this is the most popular way to gauge a candidate.

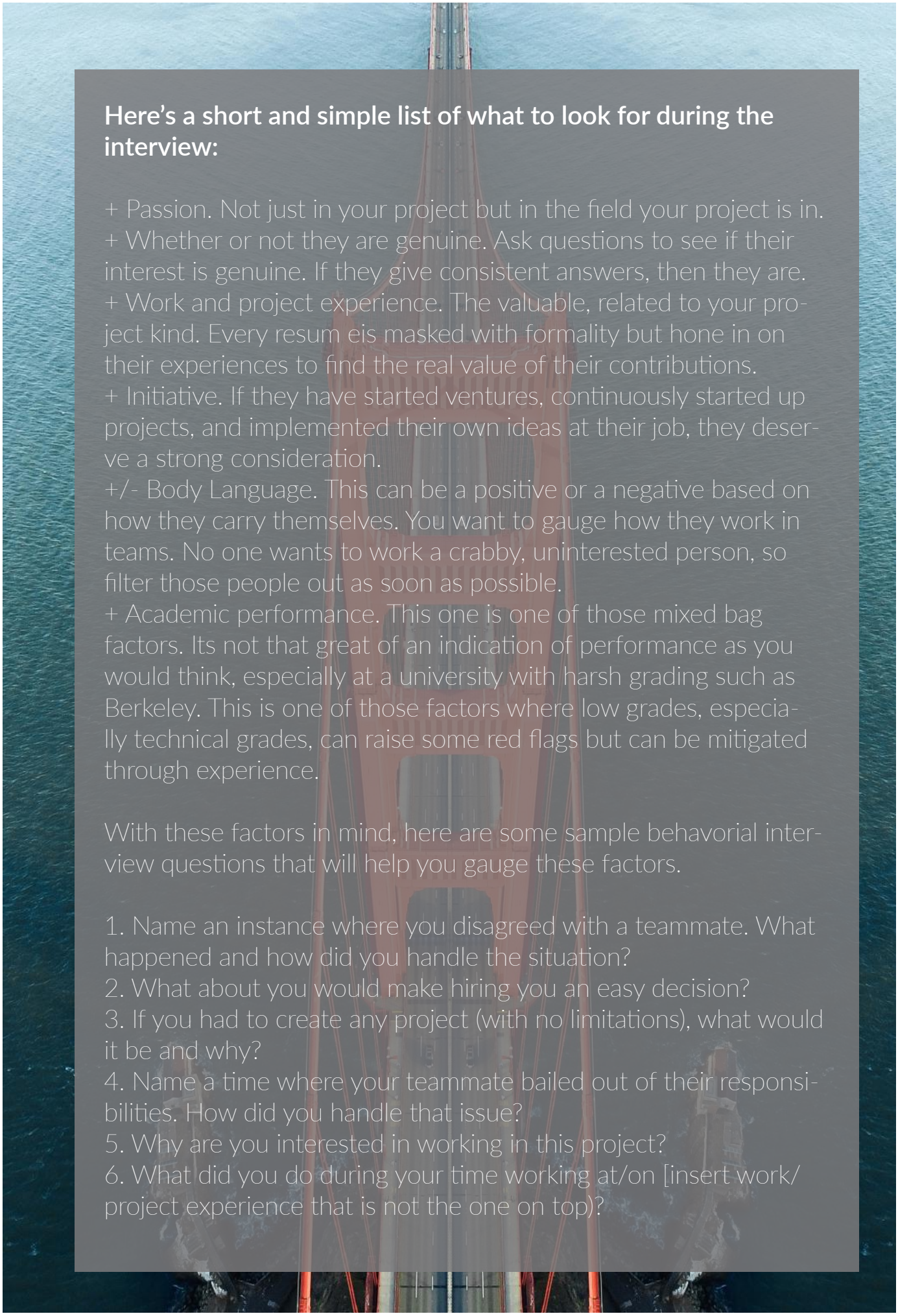
First off, we recommend that you conduct your interviews in person. This is a much better gauge compared to a phone or Skype interview. You can view the candidate's body launage to better understand how they are. If they seem too casual or unattentive, you will be able to notice those red flags. If they are energtic and enthusiasm radiates so strongly that even you feel more excited about your project, you'll be able to give them sufficient credit for that.

At the end of the day, we're researchers, not bankers. It's not a negative if someone is shy or uses too many filler words. The point of the interview for us to the gauge their interest in our project and figure out their capabilties beyond what their resume shows.

When talking to the candidate, dig deep into their experience. Look for consistency throughout their prior work experience and their projects. This will give you a good sense of their intiative.

Since most research projects are technical, give the candidate the chance to prove themself in that area. Have one puzzle, brain teaser, creative question, or even coding challenge for them to do on the spot.

Your interview does not have to be formulaic. It can be beyond a conversation. One time in an interview, one of the candidates worked on over five substantial data science projects in a year and I let him pull out his laptop to show me it. I was impressed and left there with an offer. It's interviews like that which leave a lasting impression. Give someone the chance to impress you.



Here's a short and simple list of what to look for during the interview:

+ Passion. Not just in your project but in the field your project is in.
+ Whether or not they are genuine. Ask questions to see if their interest is genuine. If they give consistent answers, then they are.
+ Work and project experience. The valuable, related to your project kind. Every resum eis masked with formality but hone in on their experiences to find the real value of their contributions.
+ Initiative. If they have started ventures, continuously started up projects, and implemented their own ideas at their job, they deserve a strong consideration.
+/- Body Language. This can be a positive or a negative based on how they carry themselves. You want to gauge how they work in teams. No one wants to work a crabby, uninterested person, so filter those people out as soon as possible.
+ Academic performance. This one is one of those mixed bag factors. Its not that great of an indication of performance as you would think, especially at a university with harsh grading such as Berkeley. This is one of those factors where low grades, especially technical grades, can raise some red flags but can be mitigated through experience.

With these factors in mind, here are some sample behavorial interview questions that will help you gauge these factors.

1. Name an instance where you disagreed with a teammate. What happened and how did you handle the situation?
2. What about you would make hiring you an easy decision?
3. If you had to create any project (with no limitations), what would it be and why?
4. Name a time where your teammate bailed out of their responsibilities. How did you handle that issue?
5. Why are you interested in working in this project?
6. What did you do during your time working at/on [insert work/project experience that is not the one on top)?

GETTING THE TEAM READY

1

WRITTEN ONBOARDING PLAN

This should include step-by-step programs to relay the following information:

a. Rules and regulations that the job requires

b. Team culture (i.e. appropriate behavior, team dynamics)

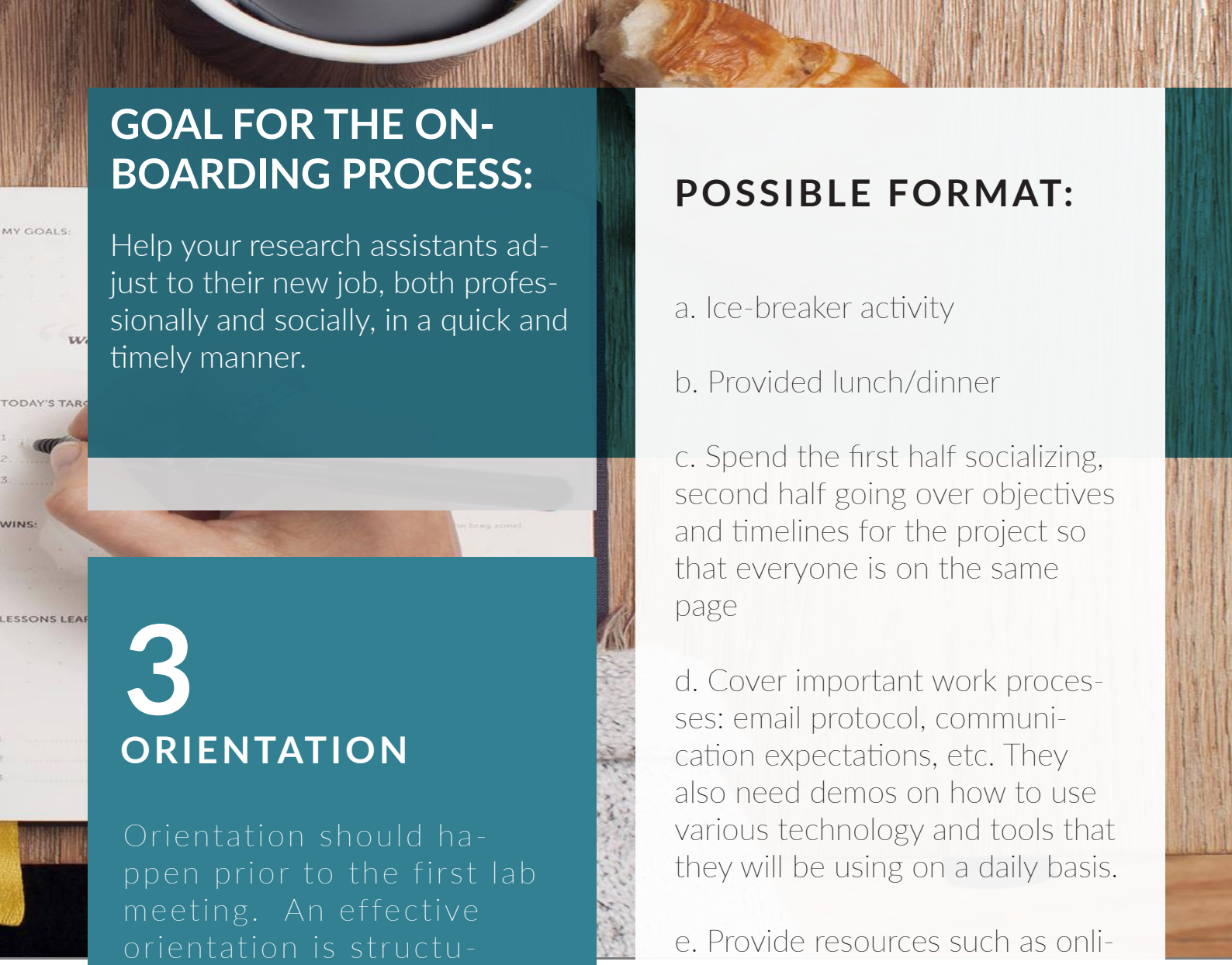
c. Objectives, timelines for the duration of the project

d. Roles and responsibilities of each team member

2

PRIOR TO ORIENTATION

Send out helpful information in advance. Clearly communicate any information that is needed for the first day. Include details on dress code, directions to the office, and who to ask for upon arrival to reduce new hire stress.



GOAL FOR THE ON-BOARDING PROCESS:

Help your research assistants adjust to their new job, both professionally and socially, in a quick and timely manner.

3
ORIENTATION

Orientation should happen prior to the first lab meeting. An effective orientation is structured, encourages participation, and gives new hires the opportunity to get to know their peers and their superiors on a personal level before jumping right into lab work. Make sure to set aside time for filling out paperwork, introductory meetings, and casual conversation.

POSSIBLE FORMAT:

a. Ice-breaker activity

b. Provided lunch/dinner

c. Spend the first half socializing, second half going over objectives and timelines for the project so that everyone is on the same page

d. Cover important work processes: email protocol, communication expectations, etc. They also need demos on how to use various technology and tools that they will be using on a daily basis.

e. Provide resources such as online information about the project, contact information for all team members, etc.

f. At the end, assign everyone a short assignment to complete before the first meeting.

PRO TIP: PEOPLE ARE EAGAER TO GET STARTED RIGHT AFTER THEY ARE RECRUITED. CAPITALIZE ON THAT MOMENTUM BY DOING YOUR ONBOARDING WITHIN A WEEK OF GETTING YOUR TEAM SET UP. THAT'LL GIVE YOUR TEAM BE A LOT OF EXTRA TIME AVAILABLE TO WORK.

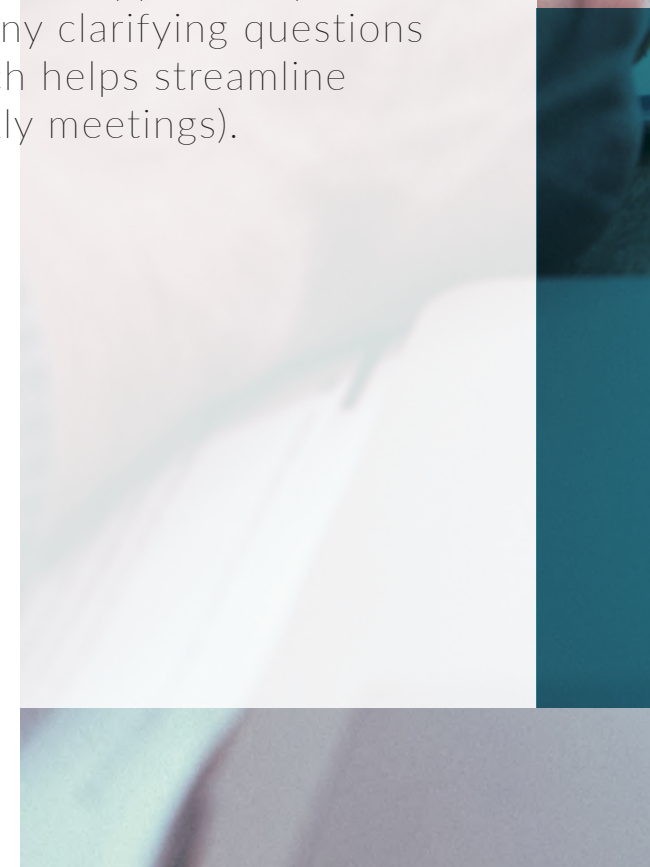
4
FIRST MEETING

Make the first meeting special to increase excitement for the project! Have each new hire present their assignment. This allows you to get a feel for everyone's skillset and make sure that nobody will fall behind once you start the actual research.

If applicable: plan a manager's meeting. Set aside time for the new hire to meet with their manager. In this meeting, the manager can get to know the new team member, share their management style, and explain their expectations.

5
FOLLOW UP

Check in on each new hire's progress once a month to ensure that they are doing what is expected of them. This builds strong relationships and also gives them the opportunity to ask any clarifying questions (which helps streamline weekly meetings).



THE KEY TO SUCCESS

When it comes to running the team, having a the right strategy is the key to having your team running efficiently all semester. All of the strategies outlined here will keep your team members accountable, something especially important down the line since a lot of teams slow down as the semester progresses. By having a good strategy, you will keep your team engaged and give them direction to keep them motivated for the rest of the semester. This is important as a lot of teams begin to lost steam as the semester progresses. We have listed out the management strategies that we think will be the more beneficial for you project.

WATERFALL

Pre-plan each step of the project, from beginning logistics to wrapping up in completion. Organize these steps in chronological order to create a timeline, and tag on deadlines in sequential order. Each task must be completed in order; the team cannot move onto the next step until the current stage is complete.

Pros:
+This method is best for planning out projects that are easy to break into components (such as making a product or researching a known field in well-defined steps).
+It also helps with teams that are very punctual and reliable; staying on a strict schedule will make the project much more efficient.
+It encourages collaboration as any struggling fellow members falling behind will be helped by the rest of the team

Cons:
-No room for flexibility, if anything unexpected occurs, timeline can be significantly disrupted
-Difficult to manage, need a strong project manager to account for all scenarios in pre planning phase and alter timeline according to research needs/priorities and still stay on track when necessary
-Requires all team members to be of around equal skill level so that some members are not too far ahead while others are

SCRUM

Each step and detail of the project is listed and categorized as “To-Do,” “In-Progress,” “Finished,” or “Need help/Problematic.” All tasks initially start in the To-Do category, and as they are worked on, moved to “In-Progress.” When completed, the task is moved to “Finished;” if an issue arises that cannot be solved, the task is moved to “Need help/Problematic.” The team’s goal is to clear out the To-Do category and end with all of the tasks in the “Finished” category. Scrum is typically done in small teams using short cycles of about two weeks, commonly known as “sprints,” in which team members meet very regularly to discuss their progress and solutions for any issues they are having (or anything in

SCRUM

Pros:
+ Very efficient and flexible for small teams, members will know who is working on what and can refer to each other for guidance, members not limited to working on a specific component of the project, they can move around freely as long as tasks can be cleared
+ Members meeting regularly can further collaboration and make the team more efficient
+ Completing work in sprints can help for getting work done in short windows of time in which all (or at least a majority of) team members are available

Cons:
- Not good for large teams, tasks can get cluttered or multiple teams might work redundantly (work on same thing without knowing)
-Some team members may not work well in sprints or may not be available for sprint cycles

Additional notes:
Some teams opt to visualize their scrum methodology using a Kanban framework, which is essentially visualizing the tasks as post-its or notes/cards under categories of "To-Do", ..., "Need help/ Problematic." Trello (trello.com) is an online version of visualizing scrum, whiteboards can also be used

DEMOCRATIC

Each step and detail of the project is not pre-planned, but rather a common goal is established by the overall team. This ensures that the team will be motivated to work towards a goal that they all want to achieve, rather than working towards a goal not pertinent to them. The team then decides how to proceed to achieve their goal using an aforementioned management or a different management style/workflow that fits their preferences. Team manager's role is to supervise (hold members accountable for deadlines they determined collectively) or to mentor.

Pros:
+ Managers can foster more communication by encouraging participation in discussions (since all choices the group makes are determined by a consensus), meaning team chemistry should improve
+ Largely exploratory projects are easier to conduct with this method because it allows for flexibility and majority voting on major decisions

+ Team members can build trust and accountability when they delegate tasks on their own after deciding how to progress after group discussion
+Good style for teams that have a good sense of which direction they want to take in the exploratory phase or have a general idea of what they want to achieve going into a project

Cons:
-Workflow can be disrupted if the group deals with conflicts of interests
-Members that lack commitment can set a negative precedent, which can reduce the team's drive to reach the overall goal and can possibly bring the team's purpose into question
-Not a good management style for teams in which members are not as passionate/flexible as their peers (such as members that were assigned to the project as an alternate choice), also not a favorable style for teams that lack past experience and a sense of direction in exploratory phases of research

CRITICAL PATH

Variant of the waterfall method, except instead of sticking to a strict schedule, managers can prioritize and reorganize tasks to get more important work done earlier.

Pros:
+Managers can optimize workflow/team efficiency by moving lower-priority tasks that the team is struggling with to a later time
+Reordering tasks can help managers complete higher-priority work earlier to account for scenarios such as researchers not being available for as much time in a certain week (e.g. students have a midterm in a certain week, so lower-priority work is scheduled for that week)
+Getting higher-priority work done earlier can help in showing progress in reports
Cons:
-Flexibility is not always favorable; some higher-priority work that is delayed for a later time might be necessary for completing the lower-priority work rescheduled for the present

PRO-TIP: COMMUNICATION IS KEY NO MATTER WHAT STYLE YOU USE. WE RECOMMEND THAT YOUR TEAM USES SLACK TO HANDLE COMMUNICATION AND TRELLO (ESPECIALLY IF YOUR TEAM USES SCRUM) TO DEVELOP YOUR SEMESTER OUTLOOK (THIS IS VERY USEFUL TO KEEP TRACK OF TASKS).

CHOOSING THE RIGHT METHOD

This is so important I reserved a whole page for it.

Theres are some important factors to consider when you are deciding which project management style is right for your team.

-If your research plan/project is set in stone and you know exactly what you're going to research, you should use waterfall or critical path method to stick to the timeline.

-If your research plan/project might have some uncertainty surrounding some parts, use a scrum method to allow for flexibility to make any adjustments needed on the fly.

-If your research plan is not detailed, but you have a general idea of what you want to achieve, use democratic method if team members are motivated enough to work without set directions from a manager.

-If your team is small, opt for a more communicative method that will allow your team to collaborate more (smaller teams easier to manage)

-If your team is much larger, choose a method that that will allow you to divide up work into groups but still stay on schedule.

Conducting Meetings

1 INTRODUCTION

Meetings provide a valuable opportunity for team members to see the overall 'big picture' of the research project. Even if your team works fairly independently, one meeting a week will be helpful for all team members to see where their work fits into the overall project timeline.

That being said, there are effective and ineffective ways to have meetings. This section will serve as a guide for how to conduct an effective meeting.

PRO-TIP: THE SUCCESS OF YOUR MEETINGS DEPEND ON THE VALUE AND TIME YOU PUT INTO PRE-MEETING PREPARATION

2
PRE-MEETING

Before the meeting, there should be set expectations for the facilitator as well as the members. It's important to have a clear goal for each meeting.

Expectations of facilitator:

- Have a clear agenda set before the meeting. Distribute this agenda to team members before the meeting
- Make any deliverables/ expectations for the meeting clear

Expectations for team members:

- Come to meeting prepared to discuss progress
- Have any deliverables ready to present

Additionally, if either the facilitator or team members cannot make it to a meeting or cannot present deliverables, they should let the team know immediately.

3
DURING MEETING

During the meeting itself, an emphasis should be placed on sharing ideas and discussing the 'big picture' of the project.

The meeting facilitator should drive the direction of the meeting, but should not dominate the conversation. The facilitator's job is to make sure that all points in the meeting agenda are discussed.

A typical effective meeting will look like this:

1. Sharing the previous week's work, presenting deliverables
2. Discussing how each person's part fits into the big picture
3. Individual feedback on current work
4. Assigning deliverables for the next meeting

That being said, here's a couple of things a meeting should not be:

- Independent work time
- Solely collaborative work time with sub-team members

4
POST-MEETING

After the meeting, it is helpful to send a followup email to remind team members what was discussed while the meeting is still fresh in their heads.

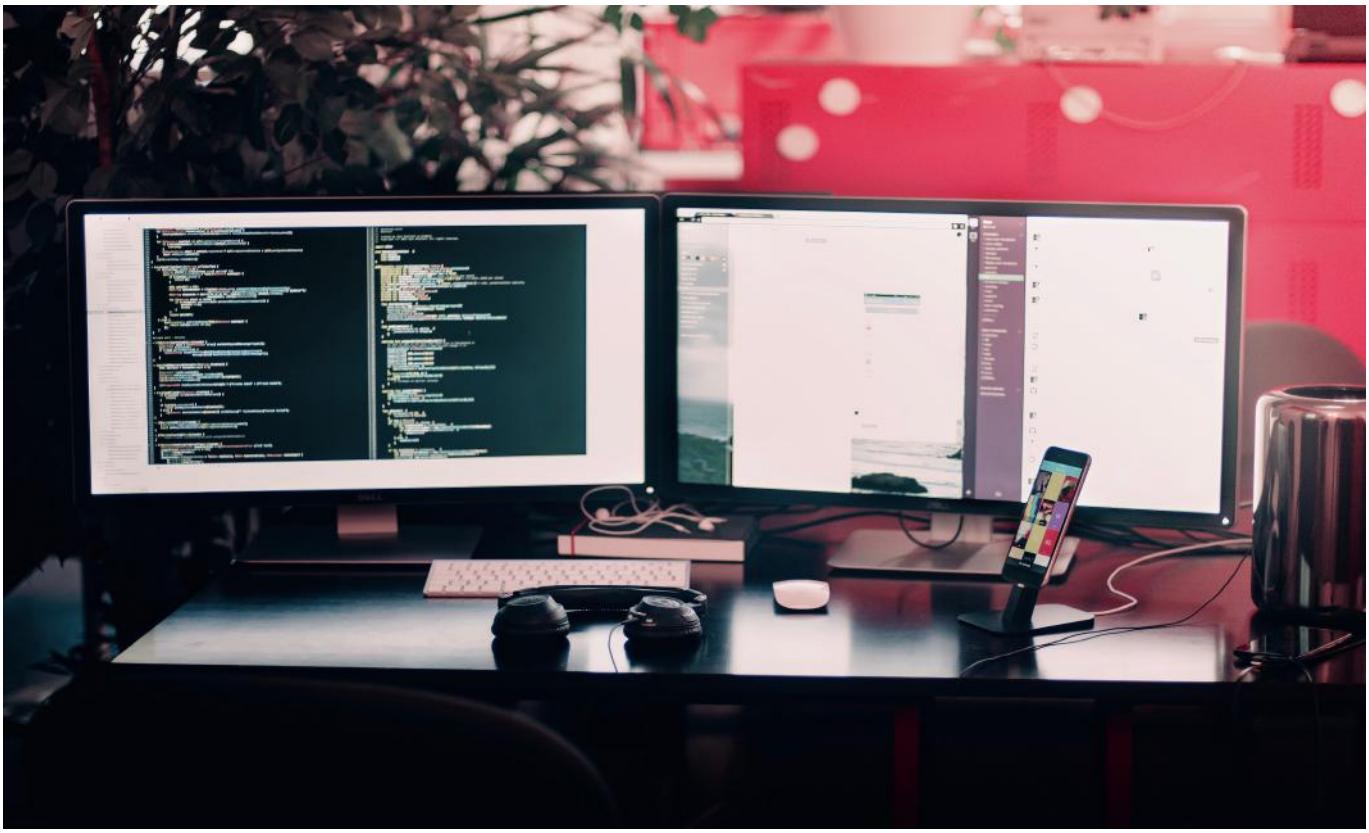
In your followup, these are some things that are good to include:

- List of topics that were discussed
- Feedback on what team members presented at the meeting
- Reminder of team deliverables for the next meeting

CONCLUSION

To summarize, here are the main points:

- Before the meeting, have a clear agenda
- Make meeting expectations clear for all team members
- During the meeting, focus on the 'big picture'
- Assign deliverables for the next week's meeting at the end of the meeting
- After the meeting, send a summary of discussed topics, feedback, and reminder of deliverables

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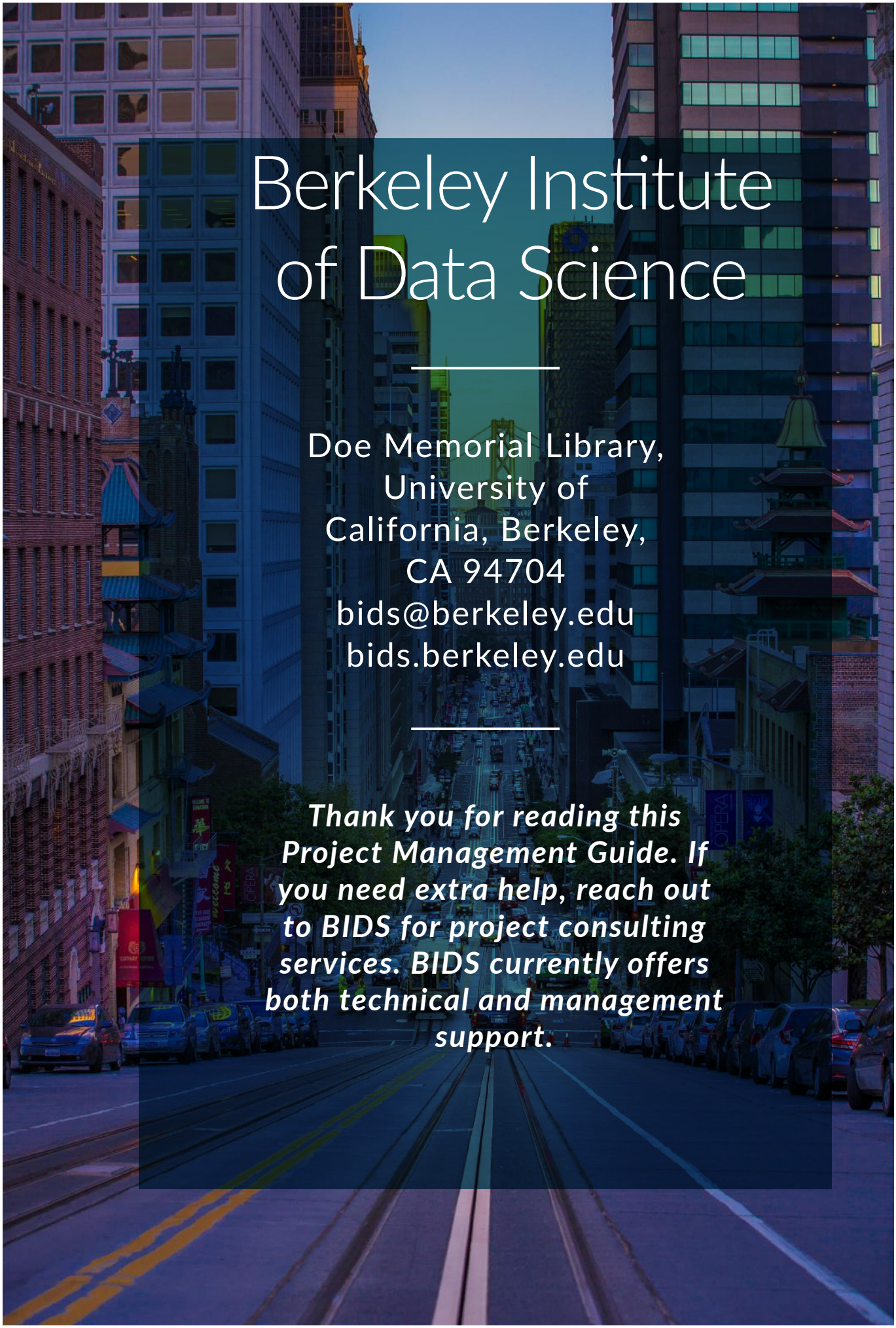

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