60-461/761: Experimental Capture

CMU School of Art / IDeATe, Spring 2020 • Profs. Golan Levin & Nica Ross

Syllabus

Professors: Golan Levin & Nica Ross
Classroom Assistant: Philippe DeBree
Office Location: CFA-111 (Frank-Ratchye STUDIO for Creative Inquiry)
Office Hours (Levin): Wednesdays, 1:30-5:00pm, CFA-111
Office Hours (Ross): Scheduler (link)

Course Web Site: https://courses.ideate.cmu.edu/60-461/s2020/
Course GitHub: https://github.com/golanlevin/ExperimentalCapture
Course Calendar: http://bit.ly/golancoursecalendar

Course Numbers: 60-461 (U) and 60-761 (G)
Location: CFA-111 (STUDIO), CFA building, CMU
Time: Tuesdays and Thursdays, 1:30-4:20pm

- Overview
- Deliverables
- Course Calendar
- Administrative Info
- Attendance Policies
- Rubrics and Grading
- Academic integrity
- Code of Conduct
- Social Rules
- Freedom of Speech
- Dealing with Stress
- FERPA Statement

60-461/761: Experimental Capture

CMU School of Art / IDeATe, Spring 2020 • Profs. Golan Levin & Nica Ross

Overview

Course Description

This is an interdisciplinary course in experimental media practices that arise from using devices to "capture" the world. We will survey state-of-the-art techniques and emerging ideas, in the industry and in academia, to capture, model, and render objects, people, places and events. The course evaluation will be project-based, in which students will capture a wide variety of things, and develop projects around the data they collect. We will cover capture techniques including motion capture, video-based capture, panoramic and multispectral imaging, depth sensors, 3D scanners, hand and eye-gaze trackers; classic and contemporary representations of face and body pose and motion; and recent progress in animation, synthesis, classification, and rehabilitation on new forms of displays.

Learning Objectives

This course is concerned with new ways of seeing,
and the creation of systems to enable new ways of seeing.

This is an interdisciplinary course in experimental media practices that arise from using devices to "capture" the world. In particular, we are concerned with how we can understand and build representations of the world using devices that sense beyond the limits of human perception. In this course, we seek:

- To explore the affordances of exotic, forgotten, and nascent image capture technologies in revealing unseen or alternative realities.
- To explore the use of computation and other technological media in expanding our expressive vocabulary for representations of people, objects, environments, and events.
- To question the practical and epistemological assumptions that underpin the project of capturing representations of reality with devices.

At the conclusion of this course, students will be able to:

- Recognize and identify the use of expanded capture techniques (such as photogrammetry, motion capture, multispectral imaging, binaural audio, stroboscopy, etc.) in popular and experimental media.
- Demonstrate understanding of the scientific principles and/or engineering foundations underlying such techniques, in revealing phenomena beyond the limits of ordinary human perception.
- Demonstrate understanding of the poetic and elucidative potentials of such techniques, and their application to the production of expressive and provocative new culture.
- Command the practical use of one or more such techniques.

Deliverables

There are 3 main Projects this semester:

1. **Typology Machine**. A study of nouns; due 2/27.
2. **Person In Time**. A study of an event; due 3/31.
3. **Final Project**. A self-directed investigation; due 4/30.

Note that the main Projects may also have additional sub-deadlines with different due dates. For example, you may be asked to prepare a work-in-progress report for a Project, or to write a proposal for the Final Project.

In addition, there will be numerous minor assignments throughout the semester. For example, you may be asked to write a paragraph responding to a reading; or to make sure you bring some item to class. Specification of these minor assignments will generally appear in the Daily Notes.

Administrata

PREREQUISITES

There are no *specific* course prerequisites for this course. Although coding skills are not absolutely *mandatory*, they can be extremely helpful, and it is recommended that students already be demonstrably comfortable with the basics of programming, such as for() loops, if() statements, arrays, and objects, as taught in courses like 15-104, 15-110, 15-112, or an equivalent. *Students who are inexperienced in coding should be prepared to fake it.*

CREDITS ALLOCATED

60-461/761 provides 12 units of academic credit.

REQUIRED COURSE MATERIALS

Laptop. Students should have access to a personal laptop. Recent, well-updated installations of Mac OSX, Windows and Linux are all acceptable operating systems. However, although nearly all of the programming toolkits with which we work are free and cross-platform, it is possible that example projects may only be provided for Mac OSX. The programming environments used for example projects and sample code will be Unity, Processing (Java), Python, OpenFrameworks (C++), and p5.js (JavaScript). For OpenFrameworks, students should be prepared to install a suitable IDE (such as XCode or Visual Studio).

Camera. A smartphone with a camera will also be helpful. Students should have access to a camera to document their work. This could be a smartphone camera if necessary.

Sketchbook. It is wise to plan your projects on paper before writing any code. You are therefore required to maintain a paper sketchbook for this course.

COMMUNICATION TOOLS

This course uses the following software systems to share information:

- *Email*. The Professors will send emails once or twice a week. Please read them.
- *This WordPress website*, through which students publish Deliverables.
- *A Google Calendar*, *http://bit.ly/golancoursecalendar*

Civics and Attendance

ATTENDANCE AND PRESENCE

- Two unexcused absences lower your final grade by one letter (A→B).
- Over 20 minutes tardy = one absence. **1st incident will be noted but excused.*
- Asleep in class = one absence. **1st incident will be noted but excused.*

It has been said: *80% of success is just showing up.* Your physical presence and civic participation in the class are of *paramount importance.* It is also important because certain of the projects are collaborative. You are responsible for what happens in class whether you're here or not. Organize with your classmates to get class information and material that you have missed.

Contact the professors in a timely way regarding your situation. Email is best, but Golan is amenable to receiving text messages (Nine one seven, five two zero, seven four five six) or messages by Twitter (@golan). If you're ill, or if you know you will have a planned absence, please let us know *before* the beginning of that class session: we can be very understanding and accommodating about planned and necessary absences, family circumstances, and/or medical issues when you inform us in a timely and professional manner.

Mental presence and social media. Physical presence means nothing if you're "checked out"; your mental presence is paramount. During the professor's lectures or guest presentations, open laptops and social media are prohibited. You can exist for few hours without tweeting, facebooking, chatting, texting, emailing. Any laptop or phone for social media, texting, etc. is banned during lectures, critiques and group discussion, unless specifically allowed/requested by the professors.

Sleeping in class. Sleeping in class happens to be a personal pet peeve of the Professor. If you sleep during a lecture, you will be poked, and asked to leave. If it happens more than once, you will be asked to leave, and also given an "absent" mark. You will incur holy wrath if you sleep in class during a guest lecture.

A WORD ABOUT UNEXCUSED ABSENCES IN CRITIQUES

Sometimes, students who haven't completed their projects skip class during critiques, because they are too embarrassed to come to class empty-handed. This type of absence is particularly self-destructive, and is one of the most objectionable and cowardly things you can do in this class. Have courage. Your participation on critique days is essential, even if your project is incomplete, because these sessions and conversations help you understand our class standards, expectations, and criteria for good work. Even if your own project is unfinished, you are still expected to contribute productively to the class discussion.

If you are absent from class during a critique, it would really be *best* if we do not accidentally encounter you later that day in the hallway, chatting away with your friends. We take your attendance very seriously, and your attendance during critiques most seriously of all.

LATENESS ON THE DAY OF THE FINAL EXHIBITION

Our class's end-of-semester exhibition is a special event in which we present our work to the public. It usually takes place in the STUDIO facility. With all of the competing requirements for space, tables, computers, and special adapters, it requires several hours of preparation. For this reason we require everyone to arrive to install their project at least 60 minutes before the final exhibition — even if it only takes 5 minutes to set up. There is a special circle of hell for students who arrive five minutes before opening time, and then have the nerve to ask for space/equipment/cables/anything. Showing up late to set up on the final exhibition day, without a prior arrangement confirmed by email, will cost you one letter grade. "Late" means: less than 60 minutes before the official exhibition opening time.

Rubrics and Grading

GENERAL EXPECTATIONS

There are a few elementary things you can do to ensure that you receive a totally respectable grade in this course. These things may seem simple and obvious, but it's sometimes surprising how few students seem to get this right:

- **Be good.** Have a positive attitude.
- **Be present.** Show up to all of the course sessions, on time.
- **Be responsible.** Communicate with your professor beforehand if you must miss a session.
- **Be diligent.** Submit all of the Deliverables, on time.
- **Follow instructions:** do all parts of the Deliverables, paying careful attention to seemingly trivial requirements (such as categorizing your blog posts correctly, formatting your code properly, giving your blog post a title in the requested format etc.).

There are also some things you can do to earn a really *great* grade in this course:

- Make interesting, novel, provocative work that's well-crafted. And document it well.
- Be fearless and resourceful about getting the assistance you need.
- Help your classmates when they're stuck.
- Make helpful contributions to discussions.

FOLLOW YOUR PASSION

This is art school. With very rare exceptions (we'll be clear), we will always prefer that you *make the assignment interesting to you* — if necessary, by creatively bending the rules or re-interpreting the assignment. Our assignments are starting-points, prompts and propositions. *Think beyond them.*

Notwithstanding the above, you will always be expected to conform to certain basic expectations in regards to deliverables and documentation. Did you include an image of your project? Did you write the requested narrative? *These expectations are non-negotiable*.

POLICIES FOR LATE WORK

Our class is fast-paced. When you submit work late, you lose big-time — not (necessarily) because of some point-deduction scheme, but primarily because you miss the chance to share, show off, discuss and get feedback on your work.

At times this semester, your creative projects may be evaluated by outside experts who review your work in class or online. If your assignment is not uploaded and documented online by the time those persons do their reviews, then your work is officially considered "too late" and will not be able to earn meaningful credit.

For minor projects, such as *Looking Outwards* blog posts: These should be uploaded and completed by the time that we get around to grading them, which is usually a few days after their stated due date. If not, we reserve the right to assign partial or zero credit to them.

- Generally we grade work a few days after the due date. *We offer no precise details about this.*
- Projects submitted after critiques (or, after external critics have performed their evaluations) may get a one-letter grade deduction, depending on circumstances, and will probably not receive written feedback, or may only receive significantly attenuated written feedback.

RUBRICS FOR CREATIVE PROJECTS

The purpose of our open-ended Projects is to provide well-circumscribed opportunities for you to make creative work with code. Generally the Project prompts will invite you to explore a specific conceptual theme or set of programming techniques, but, unless stated otherwise, there is no correct solution, and no specific requirement for how to implement your idea. A Project also asks not just for a creative solution, but also for some creativity in defining and approaching the problem. It is expected that your Projects will be documented and published on this WordPress website.

The open-ended Projects will be evaluated according to the following considerations:

- Curiosity: Are you asking questions as you work?
- Tenacity: Are you forging through difficult problems without giving up?
- Execution: Are you crafting with purpose, precision, and attention?
- Inventiveness: Are you discovering/exploring methods outside the obvious and predictable?
- Fulfillment: Did you meet all of the requested supporting criteria (such as providing scans of sketches, categorizing your blog post correctly, documenting your process, etc.)?

With Projects, it may not matter how much time a student spent making it. You may sometimes observe a very quickly-executed solution which succeeds because of its strong concept. Usually, however, the quality of a project is rewarded by extra attention to its craft.

Projects always have a list of *supporting requirements*. These are straightforward to fulfill, but if you fail to meet these, you will have points deducted. Nearly every Project assignment will ask you to:

- Create a unique blog post for your project, on our course website.
- Make sure your blog post is titled and categorized as requested.
- Embed your interactive project into the post, if this is technologically possible.
- Include a static documentation image of your project, such as a screenshot or photograph.
- Include scans or photos of any notebook sketches, if you have them.
- In the case of dynamic work, include dynamic documentation too: embed a YouTube, Vimeo demonstrating your project. Often, an animated GIF will be required.
- Write 100-200 words about your project, describing its development process. In your writing, include some critical reflection and analysis of your project: In what ways did you succeed, and in what ways could it be better?
- Embed or link to your code, if appropriate.

Related to our course policies on Academic Integrity, you must also:

- Name any other students from whom you received advice or help. If you had collaborators, explain how the work was distributed among the collaborators.
- Cite and link to the sources for any code, external libraries, or other media (e.g. photographs, soundtracks, source images) which you used in your Project. Citing your sources is super important, folks. Err on the side of generosity.

Projects will be graded with scores of A,B,C,D, or F, as follows, and will be evaluated using the "Evaluation Guidelines" rubric at the bottom of this page:

- A: You made something good [*i.e. creative excellence*]
- B: You made something that works [*i.e. correct and timely fulfillment of all requirements*]
- C: You tried to make something [*i.e. needs improvement*]
- D: You didn't even try [*i.e. unacceptable*]
- F: You didn't even show up [*i.e. zero credit*]

	Excellent	Good	Needs Improvement	Unacceptable
Process	breadth and depth of ideas generated and explored is extensive; evidence of steady progress shown through sketches, models, notes, etc. is clear and consistent; ideas are thoroughly evaluated and clearly used to inform steps taken in development and refinement stages	the required amount of ideas are generated and are moderately varied, some sporadic evidence of progress is shown through sketches, models, notes, etc.; ideas are evaluated and connected loosely to the development and refinement stages of projects	a few ideas are often generated; little evidence of progress is shown through sketches, models, notes, etc., ideas appear to be occassionally evaluated; loose connections of process work to the development and refinement of ideas is seldom visible	a single idea is typically generated; evidence of any progress is difficult to find; few sketches, models, notes, etc. have been made; evaluation of ideas isn't evident; connection of process work to the development and refinement of ideas is unclear
Work	consistently high-quality work is generated that takes an unconventional, yet appropriate approach to problem solving; craftsmanship is stellar; ideas are communicated clearly in visual and verbal forms, understanding of key course concepts is illustrated in work	good-quality work is created that appropriately addresses the requirements of projects; no significant problem areas are visible; craftsmanship is very good; visual and verbal communication of ideas is understandable; understanding of most course concepts is illustrated in work	the minimal amount of work is generated and is of fair-quality; work addresses some of the requirements of projects; craftsmanship is good; visual and verbal communication of idea is difficult to understand; basic grasp of some course concepts is illustrated in work	poor-quality work is repeatedly generated that addresses few of the requirements of projects; craftsmaship is poor; ideas communicated using visual and verbal forms are incoherent; grasp of key concepts isn't evident in work
Participation	articulation of ideas is clear; constructive criticism is often given; appropriate and valuable contributions to critiques and discussions are frequently provided; attention to class activities is consistently strong	articulation of ideas is often clear; constructive criticism is occasionally given; contributions to critiques and discussions are sometimes provided; attention to class activities is fairly consistent and good	articulation of ideas is often unclear; constructive criticism is seldom given; contributions to critiques and discussions are occasionally provided; attention to class activities is sporadic	articulation of ideas is usually unclear; constructive criticism is typically not given; contributions to critiques and discussions are rarely provided; attention to class activities is poor
Attitude	classes aren't missed and attendance is prompt; all assignments are completed on time; attitude is consistently positive; commitment to class, instructors, peers, and professional development is always exhibited	classes are seldom missed and attendance is usually prompt; most assignments are completed on time; attitude is usually positive; commitment to class, instructors, peers, and professional development is often exhibited	classes are occasionally missed and there are a few lapses in promptness; some assignments are completed on time; attitude is sometimes negative; occasional lack of commitment to class, instructors, peers, and rofessional development is exhibited	classes are frequently missed and attendance is repeatedly tardy; few assignments are completed on time according to project requirements; attitude is often negative; lack of a commitment to class, instructors, peers, and professional development is exhibited

Hey. Not every project you make can or will be a work of brilliance. It's OK. In this class, it is much more important to submit work on time than to freeze up, because your work isn't perfect or mind-blowingly original. Get it done and then get some sleep. This class is about developing fluency through practice. When you're just learning how to speak a new language, no one expects you to make beautiful poetry. And in the media arts, it's often the case that someone has done something similar before. It's OK to revisit the past in school situations.

RUBRICS FOR "LOOKING OUTWARDS" REPORTS

There may be a number of *Looking Outwards* assignments this semester. The purpose of "Looking Outwards" Assignments (LO) reports is for you to become familiar with the landscape of contemporary practices, and to begin to articulate your own set of interests and concerns within that landscape. To that end, your Looking Outwards reports will form a kind of "research diary". You may be occasionally asked to discuss or present a project you reported about in a Looking Outwards assignment.

LO's are given a grade of Pass (1) or Fail (0). Decent reports submitted by the stated deadline will pass. Missing, overdue and/or manifestly shoddy work will fail. Your professor is attentive to the evident care you put into Looking Outwards reports. Good LO's will meet the following criteria:

- You include an embedded image or video of the documented project.
- You have written approximately 100-200 words on the project.
- You explain the project, and make an effort to critique it.
- You have published the above in a blog post, on time.
- Your Looking Outwards blog post is well-titled and correctly categorized.
- Your writing is careful, considered, and critical.

PARTICIPATION AND ENGAGEMENT

This is not a competition to see who speaks up in class the most. Instead, each student will start the semester with 20 points. The following infractions will cause deductions of one point for each occurrence, at the discretion of the professors. You may or may not receive a warning before receiving a demerit:

- Falling asleep in class
- Unexcused lateness (more than 10 minutes)
- Active Facebooking & social media use
- Open laptops during a guest presentation
- Chatter or other distracting noise
- Interrupting someone who is speaking
- Inappropriate remarks or other behavior
- *This list is not exhaustive. See the Syllabus sections on Social Rules, Code of Conduct, Civics & Attendance.*

GRADING BREAKDOWN SUMMARY

Your final grade is the *product* of your Participation and your Projects, i.e.:
(Participation and Engagement) × (Projects and other Deliverables).

- Participation and Engagement are straightforwardly calculable from your attendance record and any demerits (see above) you may have incurred.
- Projects and Deliverables are graded as above, A-F.

Academic Integrity

ACADEMIC INTEGRITY

Your behavior as a responsible member of the new-media arts community is very important — as evidenced, for example, by the proper citation of your sources and borrowed code, and credit to those who have helped you. This is addressed in our course Academic Integrity Policy.

SUMMARY OF CMU ACADEMIC INTEGRITY POLICIES

Carnegie Mellon University prohibits academic dishonesty. This includes plagiarism, and may consist of: submitting the work of someone else as one's own; failing to cite assistance you received; or the failure to properly cite materials or ideas from other sources. Many of these problems can be circumvented if you're clear and generous in giving credit where credit is due. Please read the University Policy on Cheating and Plagiarism (link above) carefully to understand the penalties associated with academic dishonesty at Carnegie Mellon University. I reserve the right to determine an appropriate penalty based on the violation of academic dishonesty that occurs. The penalty for plagiarizing may range from failure on the specific plagiarized assignment to failure in the class. Repeat offenses can result in severe penalties including, potentially, expulsion from the university. If you have any questions about this policy and any work you are doing in the course, please feel free to contact the professor(s) for help.

POLICIES FOR OPEN-ENDED CREATIVE PROJECTS

For your open-ended, public-facing Projects, which will be presented and hosted in this WordPress site, there are no "correct answers". Your curiosity, creativity, ingenuity and originality are prized.

You may borrow code or ideas from other sources, within the limits of certain "reasonable person" principles described below, provided you attribute your sources. Your work will appear, publicly, on the open Internet. Your Projects will likely be discussed and critiqued in front of (and with the assistance of) your peers.

As studio art students, you are expected or invited to make extensive use of open-source libraries and freely-distributed code. When working in this way, much like a knitting circle, our classroom is structured around peer instruction, in which students are expected to help each other learn, and invited to collaborate.

USE OF FREE AND OPEN-SOURCE CODE IN PROJECTS

Credit is perhaps the most important form of currency in the economies of commons-based peer production and open-source media arts. You must cite the source of any code you use. Please note the following expectations and guidelines:

Check the License. When using others' code in your Projects, pay very careful attention to the license under which it has been released, and be certain to fulfill the terms and requirements of those licenses. Descriptions of common licenses, and their requirements, can be found here and here. Some licenses may require permission (obtain it!) or even require you to purchase the author a beer.

Use Libraries. In your Projects, the use of general, repurposable libraries is strongly encouraged. The people who developed and contributed these components to the community worked hard, often for no pay; acknowledge them by citing their name and linking to their repository.

Be Careful. It sometimes happens that an artist places the entire source code for their sketch or artwork online, as a resource from which others can learn. The assignments professors give in new-media arts courses are often similar; you may also discover the work of a student in some other class or school, who has posted code for a project which responds to a similar assignment. You should probably avoid this code. At the very least, you should be very, very careful about approaching such code for possible re-use. If it is necessary to do so, it is best to extract components that solve a specific technical problem, rather than those parts which operate to create a poetic experience. Your challenge, if and/or when you work with others' code, is to make it your own. It should be clear that downloading an artwork from someone's

GitHub and simply changing the colors would be disgracefully lazy. And doing so without proper citation would be outright plagiarism.

POLICIES REGARDING INFORMAL COLLABORATION

Our course places a high value on civic responsibility that includes, but is not limited to, helping others learn. In this course, we strongly encourage you to give help (or ask others for help) in using various toolkits, algorithms, libraries, or other facilities. Please note the following expectations:

- In this class, it's OK to give and receive help. Students who receive help from someone else are obliged to acknowledge that person in their project report, clarifying the nature of the help that was received.
- We are all teachers. Students with advanced skills are expected to help others, yet refrain from doing another's work for them. One can usually tell when one is about to cross the line. Ask yourself whether you are teaching someone to fish, or merely giving them the fish.
- When in doubt: give credit to the people who have helped you. Credit is currency.

POLICIES REGARDING FORMAL COLLABORATION

This class will have a mix of solo and collaborative projects. In the field of new media arts, many projects require a diverse set of skills. Please note the following expectations:

- For projects for which solo responses are expected, students who wish to collaborate should jointly inform the professor as early as possible. Note that permission to collaborate may not necessarily be granted.
- Collaborations in this course, if or when they arise, are restricted to pairs of students.
- Written reports for collaborative projects should describe how your effort was distributed.
- Your Project collaborator, if you have one, must be in this class. For the purposes of this course, you may not collaborate with people from outside the course (e.g. your housemate).
- You may not collaborate with the same person on more than two projects.

Code of Conduct

CODE OF CONDUCT

We (your professors) are committed to providing an educational experience that is free of harassment and intimidation for everyone in this course—regardless of gender identity and expression, age, sexual orientation, disability, physical appearance, body size, race, ethnicity, nationality, religion (or lack thereof), or technology choices. I will not tolerate any form of harassment and/or discriminatory, oppressive, suppressive, or violent behavior.

Harassment may include, but is not limited to, offensive verbal comments, deliberate intimidation, stalking, following, harassing photography or recording, sustained disruption, inappropriate or non-consensual physical contact, unwelcome sexual attention, and/or refusing to accept the limits or boundaries set by another participant in our classroom. We further define *suppressive* behavior as any sort of communication that stifles or belittles another. Participants who have been asked to stop any behavior are expected to comply immediately. We expect all of the participants in our classroom community to adhere to this code of conduct—including us, the Professors.

Debate and free exchange of ideas is encouraged, but we will not tolerate harassment. If someone engages in harassing behavior, we may take any action deemed appropriate in the Carnegie Mellon University Policy against Sexual Harassment and Sexual Assault. If you experience or witness harassment, threatening behavior, suppressive behavior, or have any other concerns, we encourage you to speak up, say something, and/or let us know immediately.

Carnegie Mellon University is firmly committed to intellectual honesty, freedom of inquiry and expression, and respect for the dignity of each individual. Acts of discriminatory harassment or intimidation by a student directed toward any member of the community are inconsistent with this commitment and will not be tolerated. Consistent with the University's Statement of Assurance, prohibited acts include harassment and intimidation motivated by discriminatory intent based on race, color, national origin, sex, handicap or disability, age, sexual orientation, gender identity,

religion, creed, ancestry, belief, veteran status, or genetic information. Any such harassment or intimidation of or by a student should be referred to the Dean of Student Affairs for resolution.

INCLUSIVITY STATEMENT

It is our intent that students from all diverse backgrounds and perspectives be well served by this course, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is our intent to present activities that accommodate and value a diversity of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. We will gladly honor your request to address you by the pronouns and name you specify.

We commit to make individual arrangements to address disabilities or religious needs (e.g. religious events in conflict with class meetings). Please advise us of these preferences and needs early in the semester so that we may make appropriate changes to our plans and records.

Social Rules

To further remove obstacles to learning, in addition to the above Code of Conduct, we also have a small set of social rules for our class. The rules below have been quoted/adapted from *Hacker School's Social Rules*, and can be found online at https://www.recurse.com/manual. These rules are intended to be lightweight, and to make more explicit certain social norms that are normally implicit. Most of these social rules really boil down to "don't be a jerk" or "don't be annoying." Of course, almost nobody sets out to be a jerk or annoying, so telling people not to be jerks isn't a very productive strategy. That's why our social rules are designed to curtail specific behavior known be destructive to a supportive, productive, and fun learning environment.

A WORD ABOUT FEAR

An obstacle we try to remove is fear. We think this is one of the most pernicious impediments to education. In most of the world, but especially school and work, people are afraid of looking stupid. This fear frequently keeps us from asking important questions like "how does that work?" or even just "why?" Worse, it keeps us from saying "I don't understand." That means many of us muddle on with a half-baked or entirely incorrect understanding of core concepts. This is particularly bad with programming, because these misunderstandings compound, and over time become harder and more embarrassing to admit to and address.

Did you know there's a well-documented phenomenon in which highly qualified people go through life feeling like they're a bunch of frauds and don't deserve the things they've achieved? It's common in work ("I can't believe I made it past the interviews. Surely someone will figure out I'm wildly incompetent and fire me soon!") and school ("Everyone here is so much smarter than me. I got in on a fluke."). This is called impostor syndrome. This is why saying "I don't know" or "I don't understand" is a positive thing. It's an opportunity for you to learn something new, and for someone else to help you with it (or vise versa).

NO FEIGNING SURPRISE

The first rule means you shouldn't act surprised when people say they don't know something. This applies to both technical things ("What?! I can't believe you don't know what the stack is!") and non-technical things ("You don't know who RMS is?!"). Feigning surprise has absolutely no social or educational benefit: When people feign surprise, it's usually to make them feel better about themselves and others feel worse. And even when that's not the intention, it's almost always the effect. This rule is tightly coupled to our belief in the importance of people feeling comfortable saying "I don't know" and "I don't understand."

NO *WELL-ACTUALLY*'S

A *well-actually* happens when someone says something that's almost – but not entirely – correct, and you say, "well, *actually...*" and then give a minor correction. This is especially annoying when the correction has no bearing on the actual conversation. This doesn't mean our classroom isn't about truth-seeking or that we don't care about being precise. But many well-actually's are about grandstanding, not truth-seeking.

NO BACK-SEAT DRIVING

If you overhear people working through a problem, you shouldn't intermittently lob advice across the room. This can lead to the "too many cooks" problem, but more important, it can be rude and disruptive to half-participate in a conversation. This isn't to say you shouldn't help, offer advice, or join conversations. On the contrary, we encourage all those things. Rather, it just means that when you want to help out or work with others, you should fully engage and not just butt in sporadically.

Freedom of Speech

FREEDOM OF SPEECH COMMITMENT

This course may present content that includes nudity and imagery, language, or dialogue that may offend some students. In viewing and discussing works of art, we encourage the broadest possible tolerance consistent with United States law.

Being in an art school, you should expect to be exposed to content that challenges your moral, ethical, and aesthetic values. In case of extremely graphic content we will warn the class in advance, but if you have a history of PTSD please let us know privately if there are types of content that are known to act as trauma triggers for you.

Freedom of speech is the foundation of our community and our nation. The works we view or produce in this class may awe, illuminate, challenge, unsettle, confound, provoke, and, at times, offend. We defend the freedom to create content and exhibit such work anywhere in the world, and we recognize the privilege of living in a country where creating, exhibiting, and experiencing such work is a constitutional right. To exhibit a work of art is not to endorse the work or the vision, ideas, and opinions of the artist. It is to uphold the right of all to experience diverse visions and views. If and when controversies arise from the exhibition of a work of art, we welcome public discussion and debate with the belief that such discussion is integral to the experience of the art. Consistent with our fundamental commitment to freedom of speech, however, we will not censor exhibitions or other presentations in response to political or ideological pressure.

Too often complaints are made through calls to the Dean or a Trustee, and the educator is the last to be informed of the charge. If you feel offended by course content, please first contact the professor privately in writing. In your email or letter, please address the following questions:

- To what in the presented work or assignment do you object?
- What do you believe is the theme or purpose of this work?

- What do you feel might be the result of viewing, reading or learning about this work?
- Is there a work of equal value that you would recommend which would serve as an alternative to the work in question?

Materials are considered innocent until proven guilty. Allegedly offensive materials will not be removed until after the review process has completed.

Dealing with Stress

Take care of yourself. Please do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress.

All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful.

If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support. Counseling and Psychological Services (CaPS) is here to help: call 412-268-2922 and visit their website at http://www.cmu.edu/counseling/. Consider reaching out to a friend, faculty or family member you trust for help getting connected to the support that can help. If you or someone you know is feeling suicidal or in danger of harm to self or others, call someone immediately, day or night:

- **CaPS Counseling: 412-268-2922**
- **Re:solve Crisis Network: 888-796-8226**
- **On campus CMU Police: 412-268-2323**

FERPA Statement

FERPA (The Family Educational Rights and Privacy Act) is a federal law that protects the confidentiality of student records. It restricts others from accessing or discussing your educational records without your consent. In this section, we discuss why you have been asked to sign a waiver, which grants your consent to have your work shown online.

In a typical class, your homework (and other information delineating your academic performance) would not be visible to the public. Indeed, the FERPA law requires that you have the right to privacy in this regard. This is one of the main reasons for the existence of so many "walled gardens" for courseware, such as Autolab, Canvas, Blackboard and Piazza, which keep all student work hidden behind passwords and paywalls.

An essential component of the educational experience in new media arts, however, is learning how to participate in the "Grand Conversation" all around us, by becoming more effective culture operators. We cannot do this in the safe space of a password-protected courseware module. Our work is strengthened and sharpened in the forge of public scrutiny: in this case, the agora of the Internet.

Sometimes students are afraid to publish something because it is of poor quality. They think that they will receive embarrassing, negative critiques. In fact, negative critique is quite rare. The most common thing that happens when one creates an artwork of poor quality, is that it is simply *ignored*. Being ignored — this, not being shunned or derided — this is the fate of mediocre work.

On the other hand, if something is truly great is published — and great projects can happen, and have happened, even in an introductory class like this one — there is the chance that it may be circulated widely on the Internet. Every year that I have taught this course, a handful of the students' projects get blogged and receive as many as 50,000 views in a week. It cannot be emphasized that this is an absolutely transformative experience for students, that cannot be obtained without taking the risk to work publicly. Students can and do get job offers and build careers on the basis of such success.

That said, there are also plenty of reasons why you may wish to work anonymously, when you work online. Perhaps you are concerned about stalkers or harassment. Perhaps you wish to address themes in your work which might not meet with the approval of your parents or future employers. These are valid considerations. On our course website, you will be identified by a public-facing username. For these reasons, you have been given the opportunity to select a blog username which can help protect your anonymity.

Please sign our course Welcome Form and FERPA Waiver.

Project 1: Typology Machine

- Overview
- Deliverables
- Learning Objectives

Overview

This project is due Thursday, 27 February at the beginning of class.

You are a crewmember of an alien expedition, sent to study Earth. You are an expert in some specialization (such as botany, zoology, geology, psychology, xenoarchaeology, exogastronomy, etc.). Your ship lands; you set up your devices; and you begin to investigate the people, places, or things which are the subject of your specialization. Your job is to:

- **build a data-collection machine or system which**, *through capture*, allows you to answer a question about your specific subject. Then,
- **create a typology of media objects** which presents your findings.

Acceptable sorts of media objects include:

- a collection of static images, 3D models, 3D prints, 2D renderings, data visualizations, etc., or
- a collection of time-based videos, animations, animated GIFs, etc., or
- a real-time software executable/game, which presents your collection in some way, possibly with the aid of a database, and which optionally supports interactions such as zooming, sorting, filtering, querying, etc.

Your objective in this assignment is to make a machine which automates capturing things, for the purposes of producing a typology. You are asked to use your typology machine to

document at least 3 items—though preferably more. Resources for your consideration include this article on typologies, and ExCap course lectures on typologies, portrait series, and candid capture systems.

Deliverables

Please be sure to complete all of the requirements below.

- **Create** a blog post on this WordPress site, whereat you will document your project.
- **Categorize** your blog post with the WordPress category, *TypologyMachine*. This helps make it easy to find your project later.
- **Describe** your project, in a single, clear, compelling sentence, at the top of your blog post. This sentence should explain what the project ***is***, and give a suggestion about why someone may find it interesting.
- **Write** approximately 300 words, in your blog post, discussing your process and results. Be sure to address the questions below.
  - *What was your research question or hypothesis?*
  - *What were your inspirations?*
  - *How did you develop your project? Describe your machine or workflow in detail, including diagrams if necessary. What was more complex than you thought? What was easier?*
  - *In what ways is your presentation (and the process by which you made it) specific to your subject? Why did you choose those tools/processes for this subject?*
  - *Evaluate your project. In what ways did you succeed, or fail? What opportunities remain?*
- **Embed** images of your project in the blog post. This might include screenshots, renderings, etc. Include a scan or photo of any relevant notebook sketches, if possible.
- **Embed** a quantity of your media objects (images, videos, GIFs) in the blog post.
- If your project is an interactive software system, **record** and **embed** a screengrabbed video demonstrating its use, ideally with narration.

Learning Objectives

Upon conclusion of this assignment, students will be able to:

- **Recognize** and **discuss** the use of *typologies* (in photography and related media), as well as small multiples (in information visualization), and “minimum inventory, maximum

diversity" systems (in science and the arts) in presenting collections of comparable units
- **Demonstrate** a practical understanding of the use of *automation* in data collection — whether by computational, algorithmic, mechanical, manual, or conceptual means
- **Design** and **construct** a novel or non-traditional *capture technique*, and demonstrate an understanding of its application to the production of a poetic, elucidative, and/or revelatory work.

Project 2: Person in Time

- Overview
- Technical Notes
- Deliverables
- Learning Objectives

Overview

This project is due Tuesday, March 31, at the beginning of class.

Using expanded capture techniques, acquire an impression of a person over time, and develop a media object from this impression which reveals your subject's quiddity — something essential, hidden or immaterial about the person.

Give consideration to the nature of the event, activity or situation during which you capture your subject. This might be a breath, a parade, a ritual, a fight, a fart, a conversation, a party, a magic trick, a stillness, a performance, a micro-expression, something fleeting, or something transpiring over days. *This list is not exclusive or exhaustive.*

Regarding your media object, your project might take the form of one or more of the following: a video; an animated GIF; an immersive VR or game; a still image or sequence of still images; a 2D image or 3D form representing a trace over time. *This list is not exclusive or exhaustive.*

Considerations

Technical Considerations

Capturing a person-in-time will almost certainly require that you research, devise, and/or customize a capture process or apparatus. You may use equipment such as our high speed cameras, thermal cameras, 360º cameras, motion capture systems, 3D/RGBD capture systems, robot arms, OptiTrack motion capture studio, Kinect depth sensors, Leap sensors, Tobii eye trackers, face tracking software, WiiMote, Wacom Cintiq, Arduino data logging shield, GPS shield, 9 DOF movement/orientation sensor, and more. You could explore backwards time, looping time, slow-motion, time-lapse, multi-perspective capture, or stroboscopy. These lists are not exclusive or exhaustive.

For this assignment, one *possible* way to develop your project could be to amalgamate synchronous recordings from two simultaneous data sources, such as video plus some parallel data stream. Examples (among many others) could include:

- Video plus GPS location (using an Arduino GPS shield or mobile phone)
- Video plus eye-tracking information (using the Tobii)
- Video plus hand joint data (from a Leap controller)
- Audio plus body skeleton data (from a Kinect, OptiTrack, or OpenPose)
- Video plus breathing or pulse data (from an Arduino with sensors)
- RGBD point clouds plus thermal imaging
- Heartbeat (pulse) plus full-body motion capture
- ...

Ethical Considerations

- Keep in mind that a subject who allows you to capture and represent them is an act of generosity.
- Please collaborate with and earn the trust of your subject. Make a good faith effort to show them your project when it is complete.
- Please secure consent from your subject, beforehand, as to how you will use, display and store your captured data, especially if you are capturing any potentially compromising or embarrassing media.
- Nude photography/videography of persons under 18 years of age is prohibited in this course. For subjects over 18 years of age, you must have clear-cut written permission to capture nude images or video.
- You are prohibited from creating capture scenarios which put yourself, your subject, or someone else in mortal danger.

Please feel free to contact the professors if you have any questions. It may also be helpful to consult our course policies on Code of Conduct, Freedom of Expression, and CMU's Reasonable Person Principle.

Deliverables

Please be sure to complete all of the requirements below.

- **Create** a blog post on this WordPress site, in which you will document your project.
- **Categorize** your blog post with the WordPress category, *PersonInTime*.
- **Write** approximately 300 words (a page) discussing your process and results, in your blog post. Be sure to address the questions below.
    1. **Discuss**: What event, activity or situation did you choose to capture? Why did you select this subject (what opportunities did it present)?
    2. **Cite** (and include an image) of at least one piece of prior work that inspired you, or which you see as related to your project.
    3. **Discuss** the system you developed to capture this event. Describe your workflow or pipeline in detail, including diagrams if necessary. What led you to develop or select this specific process? What were your inspirations in creating this system?
    4. **Discuss** the relationship between form and content in your project, including type of media object you created to present your findings. (Is it a map? a collection? an immersive VR? an animated GIF?) Why did you select this form? How does your chosen capture technique or display medium help illustrate something about your subject, beyond what a normal photograph could?
    5. **Evaluate** your project. What findings does it make clear? That is, what aspects of your subject, or their activity or situation, does your process help reveal?
- **Embed** an image of your event in the blog post. This might be a screenshot, photo, CGI rendering, etc. Preferably include more than one!
- **Embed** a scan or photo of any relevant notebook sketches you made, if possible.
- If your media object is interactive and time-based (such as an interactive VR), be sure to **create** a video to document it. **Upload** this video to YouTube, Vimeo, or directly to this WordPress site. **Embed** this video in your blog post.
- **Create** a brief animated GIF of your project, no larger than 800 pixels wide, and ideally under 5MB. Make sure your GIF is set to loop infinitely. **Embed** this animated GIF in your blog post. Be sure to preview your blog post to make sure that your GIF plays correctly.

Learning Objectives

Upon conclusion of this assignment, students will be able to:

- **Design** and **construct** a novel or non-traditional capture technique, and demonstrate an understanding of its application to the production of a poetic, elucidative, and/or revelatory temporal portrait.

Final Project

Due for in-class critique on Thursday, April 30.

The **Final Project** is a culminating capstone project presented to the public in an end-of-semester exhibition. It is anticipated (but not required) that students will use this project as an opportunity to iterate or revise a previous project from the semester.

Your Final Project is due in the following stages:

- **Date TBA**: Proposal due
- **Date TBA**: Work-in-Progress check-in presentations
- **Thursday, April 30:** In-class critique
- **Date TBA:** Image, title and caption due, for our printed catalog
- **Date TBA:** Public exhibition, in the STUDIO.
- **Date TBA:** All documentation due.

Before proceeding to the details of the deliverables, please note the following two key points:

1. **Your Final Project has two components: an exhibited media object, and its documentation.** For the exhibition on May XXX (TBA), you will present a "media object" such as a video, animated GIF, printed flipbook, 3D printed sculpture, etc. etc. Be sure to speak with the professors about what sort of equipment you'll need (such as a monitor, etc.)
2. **For the documentation, which is due no later than May XXX (TBA), please include all requested deliverables in your blog post.** Please do this even if this means repeating information you've provided previously.

Deliverables:

Catalog Materials

We will be printing a small **catalog** documenting your projects, which will be distributed at the exhibition. By May XXX (TBA), please provide the professor with the following, in a blog post categorized *ForCatalog:*

- The title of your project
- A one-sentence description of your project, ideally under 200 characters
- A high-resolution image of your project (at least 1200 pixels wide), with a 2:1 (wide) aspect ratio

Blog Documentation

As usual, you are asked to document your project in a blog post. Your project itself (the "media object") is due by no later than May XXX (TBA), in time for our 5pm exhibition. **The blog documentation described below is due no later than May XXX (TBA)**, though you may submit it earlier if you wish.

- **Create** a blog post, titled *nickname-final* and categorized *Final*.
- At the top of your blog post, **place** the title of your project, the one-sentence description, and the high-resolution catalog image.
- **Write** about 200 words on the following:
  - **What *IS* your project?** (Depending on your project, it may be helpful to discuss the following things separately: the *subject* you wanted to capture; the *system* you created to capture it; and the nature of the *media object* you created in order to present the results of your capture process.)
  - **Why is your project interesting?** (Depending on your project, it may be helpful to discuss: Why were you interested in capturing your particular subject? In what way is your capture system or media object novel? What motivated or inspired you to conduct this investigation?) Note that you may need to educate your reader somewhat about your subject, tools, or techniques.
  - **Contextualize your work.** Include an image of prior or related work by others. Briefly discuss how your work continues (whether technically, or in terms of content) where previous work leaves off.
  - **Evaluate your work.** Where did you succeed, what could be better, what opportunities remain?
- **Embed** your media object. This is the thing itself, in the best quality you can. If your media object cannot be embedded in a web page (e.g. if it's an executable application, or a 3D-

printed object), please make an embeddable media object to document it, such as a screen-grabbed video recording or an animated GIF.

- After embedding the media object, **narrate the process** of creating your project. Here's the place for your "making-of" section. Include the following supporting materials:
  - Write **text** about how you made/captured the thing
  - Include process **images**: sketches from your notebook, photos of you working on your project, screenshots at intermediate stages, alternate versions of your final object, dead ends you pursued.
  - Please include redundant documentation in the form of **animated GIFs**, which are very durable.