The art of information
Information-theoretic approaches to psychology and art

Course Term: Winter 2026
Course Number: XXXX
Registration Restrictions: None
Credit Hours: 1.0

Course Dates: Jan XX–XX, 2026
Course Days and Time: MTWThF, XX–XX
Course Location: XX
Office Hours: DAY, XX–XX (Ames 101) or by appointment

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Course website: http://artofinformation.github.io/

Course overview

1. Course description

Why do some songs get stuck in your head? Why are certain things easier to remember than others? Does Jackson Pollock paint "randomly" (and if so, what does that even mean)? These questions contain both psychological components and aesthetic components. In this course, we'll unify these two kinds of questions through information theory — the statistical and mathematical principles underlying how we process, represent, and use information. We will explore how tools and principles from information theory can help us understand our minds and our aesthetic experiences. This course will contain an introduction to information theory, a discussion of its application in psychology and art, and an analysis of scholarly literature and popular media on these topics.

2. Intended audience

This class assumes no prior experience with psychology, information theory, or art. Familiarity with any of these topics is certainly welcome, but not required. A lack of familiarity should not preclude you from taking this course (in fact, maybe it should encourage you!).

This course might be a good fit for you if:

- You're curious about the fundamental principles of our mind, and how we can characterize them. Why do we remember some things and forget others? Why do we see what we see?
- You like engaging with art deeply. You enjoy reflecting on why you (or someone else) might like a certain thing and how the art accomplishes what it's trying to do.
- You're curious about analyzing these questions using tools and insights from other fields (here, information theory).

This course might not be for you if:

- You *really* don't like math. None of the assignments or materials used in the course will assume prior experience with information theory. But to get the most out of this course, it's important that you're open to a little bit of math (even though you won't be doing much yourself). (For this same reason, you shouldn't take this course if you're expecting or hoping for *lots* of math — e.g., proofs, exercises, and so on.) All to say: Some of our materials will engage with math lightly, so to get the most out of them you'll need to be open to looking at that math.
- You're looking for a broad survey or in-depth introduction to any of the specific topics or approaches used in the course (psychology, information theory, or art). After all, there are semester-long introductory courses dedicated to just one of these three! So, in such a short time, we'll focus on things at the intersection of these approaches that are fun, surprising, and important.

- You are not interested in thinking about and discussing art. It's important that everyone is open to thinking about the course material together, even if it's not your area of expertise.

3. Course goal / Learning objectives

Throughout this course, you will…

- Learn some important factors that determine what (and how) we remember, see, and decide.
- Understand basic tenets of information theory, and how they can motivate the above.
- Apply this knowledge to analyze art and aesthetic experience.
- Engage with both scientific papers (i.e., peer-reviewed journal articles) and popular media (i.e., visual essays, newspaper articles) on these topics.

4. Course website

Throughout this syllabus, you'll see mentions of a "course website." This is a website that I made for the course to hold our materials, assignments, and more. Here it is: http://artofinformation.github.io/.

I find this more interactive and easy to use (for everyone) than Canvas. So, we'll use the course website as much as possible, and Canvas as little as possible (you'll use Canvas only for submitting assignments).

Assessments & Policies

1. Course expectations

Each class will be split (roughly) in half between lectures (that will include lots of demos and participation) and seminar-style discussions. To this end, you will get the most out of this course if you finish the required readings before class, complete all assignments, and actively participate in class.

2. Academic Honesty

Refer to this statement from the Dean's Office below about plagiarism and academic integrity:

The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. You may consult the associate dean of student conduct (or designee) by calling the Office of the Dean of Students at 410-516-8208 or via email at deanofstudents@jhu.edu. For more information, see the Homewood Student Affairs site on academic ethics: (https://studentaffairs.jhu.edu/policies-guidelines/undergrad-ethics/).

2(a). Use of ChatGPT (and related tools)

Please do not use ChatGPT or related tools (Gemini, etc.). As you know, it's difficult to actually enforce a ban on these tools. However, I'm not sure that these tools will help you much throughout the class, and ideally they shouldn't be needed at all. This is true for a few reasons. First, because we have class every day, the assignments for each class are short and quick — and they're best if you experience them on your own. Second, many of the assignments draw on your own experience or personal taste (e.g., music you like), which ChatGPT doesn't know. Finally, given the nature of many of the materials (e.g., visual essays), I don't think ChatGPT will be able to give you much more information than what you can glean on your own.

For all those reasons, I highly recommend that you don't use ChatGPT. There shouldn't be much of a reason to do so in the first place. However, if you do use ChatGPT or related tools, you must make that clear in whatever you are submitting (with, e.g., just a line saying that ChatGPT helped you with this assignment). If you do so, that's fine — but you'll need to acknowledge that in whatever you submit. Failure to acknowledge ChatGPT in an assignment where it was used will count as plagiarism, and will be treated in accordance with the University's guidelines there.

3. Academic accommodations

Students with disabilities will absolutely be provided with accommodations, provided they first reach out to Student Disability Services. Anyone in need of accommodations for this course can acquire an accommodation letter by contacting them by phone at (410) 516-4720, or via email at studentdisabilityservices@jhu.edu.

If you have separate accessibility concerns related to this course that you would like to discuss with me personally, please don't hesitate to ask me after class, at office hours, or over email.

4. Required Materials

There is no required textbook for this course. All materials (e.g., PDFs of course readings, links to demos, and more) will be available for download on the course website (http://artofinformation.github.io/).

In general, we will use the course website for everything except for submitting assignments, which will be done via Canvas.

5. Assignments

All assignments should be uploaded via Canvas in accordance with the instructions for that day. (Instructions will be available both on the Canvas submission portal and on the course website.) There will be two types of assignments (both are required):

1. **Daily assignments** (*due by 11am **before** the start of each class, except for the first and last classes*): The assignments for each day will be specified both on Canvas and on the course website. (I recommend checking the course website first, as that will often be the most updated source for all things related to the course.) These will be short, low-stakes assignments to help you reflect on the material for class. Sometimes, they will be short reading responses (100–150 words) to a scientific paper; other times, they may be short reflections on what you were curious about or would like to discuss in class. In all cases, you should feel free to write what you liked, what you disliked, and so on — the most important thing is just that you're engaging with the material seriously! For that same reason, the writing in these assignments need not be polished. These assignments will be graded pass/fail.
2. **Final assignment** (*due by 11:59pm EST on the last day of class*)
   Below are 3 different options for a final assignment. Please select **one** of the three to complete. If you have another idea for a final assignment (e.g., one that might be more tailored to something you're researching or something you're creating), please don't hesitate to ask me about it and we can try to figure something out.

In any case, please submit to me a proposal for what you'd like to do with the final assignment by January XX. This should be just a few sentences describing what you're thinking of doing. This is so that I can make sure whatever you have in mind sounds reasonable before you start doing it! The assignment options are:

Option A: Scientific article critique (400–500 words total). Choose one of the scientific papers we read in class (or a related one if you find something cool — for example, something that is cited in or cites one of the papers we read together). In 200–250 words, describe the paper's main question, experiments, results, and conclusions. In another 200–250 words, describe the strengths and weaknesses of the paper, and how they relate to the general approach of the class. You might try to synthesize different themes here; for example, if the paper is about information-theoretic approaches to memory, you might try to think about how this could provide interesting insights into art (and vice versa).

Option B: Popular media proposal (400–500 words total). Throughout the course, we've relied on not only scientific papers, but also media or news articles more broadly (for example, some articles from my absolute favorite website, pudding.cool). Imagine you're a freelance writer, and the Editor of one of these venues (e.g., *The Pudding*, *The New York Times*, etc.) has asked you to write a brief piece about information-theoretic approaches to psychology or art. Specifically, they want a non-scientific discussion of why we should care about information theory when thinking about psychology or art; i.e., what can information theory help us do? What are some cases where it has been used effectively? What are some open questions that could be studied with this approach? Choose any of these angles and write a brief article about them.

Option C: Artistic critique (400–500 words total). Choose a piece of art you'd like to analyze. (Here, "art" can be broadly construed; it can be visual art, a song, an album, a piece of writing, etc. In just the Baltimore Museum of Art, you might examine a painting, an exhibit, or even the design and layout of the building itself!) Critique the piece while integrating some of the psychological or information-theoretic approaches discussed in class.

6. Grading

This course will be graded pass/fail. A grade of 80% will be considered a pass.

Grades will be calculated as follows:

- Attendance and participation: 30%
- Daily assignments (5% each, 8 total): 40%
- Final assignment: 30%

Class schedule

Note: I will try to keep the schedule here in the Syllabus as updated as possible. However, as above, I recommend checking the course website (http://artofinformation.github.io/) for the most updated schedule and materials. All PDFs will be available on the course website.

Session	Class topics	What to do before class
1/6	Introductions! *(Class policies, what will this class cover, etc.)*	Read the syllabus!
1/7	An introduction to information theory *(What is information theory? Where does it come from? Why do drums — and music more generally — seem to be culturally universal?)*	Chapter 1 of *The Information: A history, a theory, a flood* by James Gleick.
1/8	Compression in information and in music *(What is compression? What makes something compressible? Are songs really getting more repetitive?)*	https://pudding.cool/2017/05/song-repetition/ https://pitchfork.com/features/resonant-frequency/6327-resonant-frequency-36/
1/9	Compression in psychology: A case study of memory *(Why do we remember certain things but not others? Where do typical 'memory limits' come from? Why is "12345" easier to remember than "15324"?)*	What's magic about magic numbers? Chunking and data compression in short-term memory, Mathy & Feldman, *Cognition* (2012). https://pitchfork.com/features/overtones/9340-word-is-bond-black-hippy-and-the-power-of-repetition/
1/10	Complexity and its consequences *(What kinds of things do we like listening to? What makes a beat groovy?)*	The sound of beauty: How complexity determines aesthetic preference, Delplanque et al., *Acta Psychologica* (2019). https://pudding.cool/2023/06/groove/

1/11	Complexity: one thing or many? *(But what even is complexity? Can our minds appreciate it in the multitude of ways that it exists out in the world?)*	Domain-general representation of complexity, Boger & Firestone, *under review*.
1/12	Randomness in the world *(What does it mean for something to be 'random'? Why do we care what things are random and what things aren't? Does Jackson Pollock paint randomly?)*	Randomness and mathematical proof, Chaitin, *Scientific American* (1975). Revisiting Pollock's drip paintings, Jones-Smith & Mathur, *Nature* (2006). https://www.wsj.com/articles/could-your-child-really-paint-that-1539959482
1/13	Randomness in the mind *(Are we random? Do we have a 'random' device?)*	Highlighted selections of: The perception of randomness, Bar-Hillel & Wagenaar, *Advances in Applied Mathematics* (1991). Random behavior is stable across tasks and time, Boger et al., *JEP:General* (2025).
1/14	Information and language *(Why are some words long while others are short?)*	Word lengths are optimized for efficient communication, Piantadosi et al., *PNAS* (2011). https://pudding.cool/projects/vocabulary/index.html
1/15	End of class! *(Special topics, the last hurrah)*	Final paper due! No reading.