

Driving, Deepfakes and Disinformation: Applications of Visual Cognition in the Real World

PSYC423 - Winter 2025

Syllabus



General Course Information

PSYC 423 – Visual Cognition in the Real World

3 credits

Pre-requisites: PSYC 221/3.0 or PSYC 220/6.0 or COGS 200/6.0

Course Description

Visual cognition has been studied extensively in the lab, but it's not always clear how theoretical questions apply to the real world. In this course, we will examine both theoretical questions on perception, attention and memory as well as see how these apply to real world situations - examining x-rays, distracted driving and gaming.

Instructor Information

Name: Dr. Monica Castelhano

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Drop-In hours: (subject to change; please see onQ)

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Important University Dates

Key dates (first day of class, tuition due date, last day to add/drop courses) are important to your academic success. Please find them at [Important Dates](#).

Equity, Diversity and Inclusivity Statement

Queen's is committed to counteracting discrimination in this institution and developing a climate of educational equity that recognizes and respects the equal dignity and worth of all who seek to participate in the life, work and mission of the University. Such a climate is created and maintained by developing a university-wide commitment to and understanding of educational equity, supported by policies, programs, curricula, practices and traditions that facilitate individuals - and equity-seeking groups- free, safe, and full participation. See [Queen's Educational Equity Policy](#) for further information.

Course Learning Objectives

By the end of this course students will be able to:

- Summarize current theories visual cognition with a special emphasis on scene processing, object recognition, visual attention, eye movements, visual memory and related applied fields
- Critically evaluate current, experimental literature in the field of visual cognition
- Develop writings skills
- Summarize and communicate research findings in one area of visual cognition
- Generate new research question in the field of visual cognition

Course Format

Each week will focus on a particular topic. Think of the class as having two meetings per week, one is in-person and one takes place over two days and participation is asynchronous and online.

Here is the structure for each week:

- **Every week** you will have two readings focused on the topic for that week.
- Every **Tuesday by 6pm**, a reaction paper is due (see below for a description).
- Every **Wednesday** we will have an in-person class discussion, in which we discuss the readings and the topic for that week (see below on how these will proceed).
- Every **Thursday by 6pm**, one person from each group will be assigned as the presenter and will post a video presentation describing a new study on the topic for that week.
- Every **Friday by 6pm**, other members of a group will post a reaction video answering a question posed by the presenter.

Generally, you will be introduced to a new topic through the weekly readings and a Reaction paper. You will have the opportunity to share thoughts of your reaction paper during the class discussion. Then, each week you will participate *either* as the presenter for your group or as a viewer for the presenter. As the presenter, you will lead discussion on an article of your choosing related to that week's topic through the video presentation discussion board (on Padlet, more info below).

Course Materials

There is no textbook. Articles will be assigned to be read for each class. You will be able to download the articles from the web/library – use your research skills! Any articles not available through the school library system or available on-line (through Google Scholar, the author's own website or other repositories such as Research Gate, bioRxiv or PsyArXiv) will be provided via onQ in advance. *Please email me if you are having trouble finding a specific article.*

Workload

Participation

Participation is always good in a seminar class! You will be graded for your participation in the course, both for the in-person discussions and for the online video assignments. All criticisms, comments, and questions about the readings and topics are encouraged. In addition, the reaction paper (described next) is designed to give you something to say and so everyone is going to have an opportunity to add to the discussion.

Reaction Paper

Each week you will be required to submit (via *onQ*) a Reaction Paper. It is not to be **no more than 1 page long** (more than that and you should edit). The reaction paper is meant to show that you have done the readings and that you have **thought about them**. I am interested in *your* ideas – not the authors'. A summary of the experiment is insufficient. Demonstrate your ability to synthesize information, critically examine or come up with your own ideas for experiments (i.e., show creativity). I suggest that you begin by coming up with something you thought of while reading, a critique of the experiment, theoretical question about the experiment, or a possible next step for a future study. By the end of the semester, you will be able to demonstrate that you can go beyond the material as presented.

Reaction papers are submitted via onQ Assignment Folder – under each week's banner.

Reaction papers are **due by 6pm each Tuesday** prior to Wednesday class discussion.

NB: **No Exceptions** will be made for late reaction papers. Your best 9 grades count from a possible 10, so the bottom grade is dropped. You can skip a week or submit all 10 to get your highest grades.

ChatGPT & other bots: Although this new Chatbot does an ok job of summarizing things, it is not so great at generating new ideas. If you just copy and paste what it spits out, you'll likely not do well. I've tried it and all of the outputs would receive at most a C, but most would get a failing grade. It basically sounds like a repetitive highschooler. However, you can use it to get things started (so you're not staring at a blank page). Also, be aware that this thing makes stuff up – do not trust any citations it spits out. Double check it all!

TLDR: Use ChaptGPT as a starting point if you'd like, but be sure to go beyond just the basic output it provides.

Grading of Participation and Reaction Papers is based on Young's I-C-E (Ideas, Concepts, and Extensions):

- **3/3** Comments and responses reveal a capacity to analyze, synthesize, and evaluate material and give evidence of original thinking and an extensive knowledge base. They demonstrate a careful, concise, critical analysis with a clear and well-argued hypothesis based on the material. They exhibit evidence of learning that is willing to explore beyond the initial learning situation.
- **2/3** Comments and responses reveal a good analysis and some critical reasoning. They demonstrate a reasonable understanding of relevant issues and familiarity with the

material. They demonstrate a solid understanding of the relationship or connections among the basic concepts. They show a need to be more concise or precise in details and more careful in articulating arguments.

- **1/3** Comments and responses show an acceptable treatment of the subject matter. They demonstrate an understanding of the basic facts, vocabulary, details, and elemental concepts and show an ability to deal with simple issues arising out of the material. The student needs to engage the subject matter more fully and formulate ideas more clearly.

Paper Presentation/Discussion

As a presenter, you will lead the discussion for your group. For each presentation, you will choose a new article related to that week's topic and provide a **~5 minute summary presentation**. The video must feature you as a "talking head" throughout, summarizing the study's key points, including its stimuli, methods, and results, and posing three discussion questions orally. To help with the summary, each presenter can use up to 3 powerpoint slides to present visualization of stimuli or results or other key figures.

The video presentations can be done via Canva or other software and then uploaded to Padlet. Padlet offers a platform to post presentation videos and then response videos. The class will be divided into groups (see onQ for your group assignments), and you will comment on each other's presentations from your group. The powerpoint files and a copy of your chosen article are to be uploaded on onQ (under Assignments for the Presentation number). They are due at the same time as the video is due.

The uploads and the presenter's video must be posted by **Thursday at 6pm** and each group members' response must be posted by **Friday at 6pm**.

How it will work: At the start of each week, I will send *an invitation link* to all presenting members of each group. Every presenter must upload their presentation video by 6pm. At 6:30pm on Thursday, the link will be posted to the class (via Class Announcements).

- **Presentation Videos:** For presenters, summarize the main question, experiment task and the main pattern of results. Then present 2-3 discussion questions for your fellow group members to respond to and comment on. These videos can be up to a max of 5 min in length. Be sure to **label your video with your name and Group Letter (A-E)**.
- **Response Videos:** If you are not presenting in a given week, you are expected to post a response video. You are assigned to respond to the presentation of your group member. For groups who have fewer group members and no presenter on a given week, you may choose one of the other group presenters to respond to for that week. Response videos must be at least 30 sec long and a max of 5 min long.

NB: Depending on how this goes, the set-up/process may be updated.

Class Discussion/Presentation Responses Guidelines

University is a place to share, question and challenge ideas. I want you to keep in mind that each person brings a different lived experience from which to draw upon. To help one another learn the most we can from this experience please consider the following guidelines.

1. Make a personal commitment to learn about, understand, and support your peers.
2. Assume the best of others and expect the best of them.
3. Acknowledge the impact of oppression on the lives of other people and make sure your writing is respectful and inclusive.
4. Recognize and value the experiences, abilities, and knowledge each person brings.
5. Pay close attention to what your peers say before you respond. Think through and review your responses before you post or send them to others.
6. It's ok to disagree with ideas, but do not make personal attacks.
7. Be open to being challenged or confronted on your ideas and to challenging others with the intent of facilitating growth. Do not demean or embarrass others.

If You're Sick or Having a Rough Week...

Reaction Paper assignments, participation in class discussions and presentations have been designed with flexibility for academic consideration for all students. This means that "Short term Requests for Academic Consideration" (submitted through the Faculty of Arts and Science portal without documentation) are not needed and long-term requests will be handled on a case-by-case basis if needed. Please send me an email (monica.castelhano@queensu.ca) asap and we will work something out that works for you and your group.

Research Proposal

There is no exam in this course. Instead, you will be writing a brief research proposal.

On **Wednesday April 9th at 11:59pm**, you will be required to submit a research paper (10 pages max) on a topic of current interest within the field of scene perception/scene processing. The final paper will include a review of past research relevant to your topic, and a proposal for future research (i.e., a new experiment). Late papers will be penalized 10% per day and receive a grade of 0 after 5 days. More information will follow (submit under Assignments on onQ).

To help you get a head start on this assignment, you will choose your topic and hand-in a **one paragraph summary** (1/2 page long max) describing your idea for the final paper on **Friday March 14th at 5pm**. This half-page summary will be part of your final research proposal grade (5%; submit under Assignments on onQ). Each student will receive feedback on their idea.

Universal Accommodations...

Both these assignments (proposal idea and proposal research paper) will have a three-day grace period. That is, your assignments are due on the due date posted, but will be accepted, without penalty, up to 72 hours afterwards. After the grace period, the late penalties will apply as described above.

Evaluation

Class Participation	15%
Reaction Papers	15%*
Presentations	25%
Research Proposal	45%

*Best 9 out of 10 reaction papers

Grading Method

All components of this course will receive numerical percentage marks. The final grade you receive for the course will be derived by converting your numerical course average to a letter grade according to Queen's Official Grade Conversion Scale:

Queen's Official Grade Conversion Scale

Grade	Numerical Course Average (Range)
A+	90-100
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	67-69
C	63-66
C-	60-62
D+	57-59
D	53-56
D-	50-52
F	49 and below

Academic Integrity

Queen's students, faculty, administrators and staff all have responsibilities for upholding the fundamental values of academic integrity; honesty, trust, fairness, respect, responsibility and courage (see www.academicintegrity.org). These values are central to the building, nurturing, and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University (see the Senate Report on Principles and Priorities <http://www.queensu.ca/secretariat/policies/senate/report-principles-and-priorities>).

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments and their behaviour conform to the principles of academic integrity. Information on academic integrity is available in the Arts and Science Calendar (see Academic

Regulation 1 <http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations/regulation-1>), on the Arts and Science website (see <https://www.queensu.ca/artsci/students-at-queens/academic-integrity>), and from the instructor of this course. Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery and falsification, and are antithetical to the development of an academic community at Queen's. Given the seriousness of these matters, actions which contravene the regulation on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

Accommodation Statement

Queen's University is committed to achieving full accessibility for people with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all their academic activities. The Senate Policy for Accommodations for Students with Disabilities was approved at [Senate in November 2016](#). If you are a student with a disability and think you may need academic accommodations, you are strongly encouraged to contact the **Queen's Student Accessibility Services (QSAS)** and register as early as possible. For more information, including important deadlines, please visit the [QSAS website](#).

Copyright Statement

This material is copyrighted and is for the sole use of students registered in PSYC 423. This material shall not be distributed or disseminated to anyone other than students registered in PSYC 423. Failure to abide by these conditions is a breach of copyright, and may also constitute a breach of academic integrity under the University Senate's Academic Integrity Policy Statement.

Course Schedule

The course is roughly designed around the processing timeline, with early processing focused on initial processing leading to highly complex processes. In addition, every other week we delve into an applied area that stems from or is related to the theoretical discussion of the previous week. The whole semester will build on the previous weeks and discussions will definitely loop back to earlier discussions with a new perspective.

Week	Day	Date	Topic	Readings & Assignments
1	Wednesday	08-Jan	Introduction	
	Online	10-Jan	Introductory Video Presentation Assignment Due Thursday at 6pm	
2	Wednesday	15-Jan	Initial Perception of Scenes How predictions about the world misleads us and helps us	Intraub, H. & Richardson, M. (1989). Wide-angle memories of close-up scenes. <i>Journal of Experimental Psychology: Learning, Memory, and Cognition</i> , 15, 179-187. Peelen, M. V., Berlot, E., & de Lange, F. P. (2024). Predictive processing of scenes and objects. <i>Nature Reviews Psychology</i> , 3(1), 13-26. (link) Reaction Paper #1 Due
	Online	17-Jan	Video Presentation Assignment (Group Member 1): Presentations due Thursday at 6pm; Responses due Friday at 6pm	

3	Wednesday	22-Jan	Memory for Scenes	<p>Hall EH, Bainbridge WA, Baker CI. Highly similar and competing visual scenes lead to diminished object but not spatial detail in memory drawings. Memory. 2022 Mar;30(3):279-292.</p> <p>Kaunitz, L. N., Rowe, E. G., & Tsuchiya, N. (2016). Large capacity of conscious access for incidental memories in natural scenes. Psychological science, 27(9), 1266-1277.</p> <p>Reaction Paper #2 Due</p>
	Online	24-Jan	<p>Video Presentation Assignment (Group Member 2): Presentations due Thursday at 6pm; Responses due Friday at 6pm</p>	
4	Wednesday	29-Jan	Photos and False Memories	<p>Wang, J., Otgaar, H., Howe, M. L., Lippe, F., & Smeets, T. (2018). The nature and consequences of false memories for visual stimuli. Journal of Memory and Language, 101, 124-135.</p> <p>Prasad D, Bainbridge WA. The Visual Mandela Effect as Evidence for Shared and Specific False Memories Across People. Psychol Sci. 2022 Dec;33(12):1971-1988.</p> <p>Reaction Paper#3 Due</p>
	Online	31-Jan	<p>Video Presentation Assignment (Group Member 3): Presentations due Thursday at 6pm; Responses due Friday at 6pm</p>	

5	Wednesday	05-Feb	<p>What you see: Mental Representations How much do you really see as you look around?</p>	<p>Rensink, R. A., O'Regan, J. K., & Clark, J. J. (1997). To see or not to see: The need for attention to perceive changes in scenes. <i>Psychological science</i>, 8(5), 368-373.</p> <p>Barzy, M., Morgan, R., Cook, R., & Gray, K. L. (2023). Are social interactions preferentially attended in real-world scenes? Evidence from change blindness. <i>Quarterly Journal of Experimental Psychology</i>, 76(10), 2293-2302.</p> <p>Reaction Paper #4 Due</p>
	Online	07-Feb	<p>Video Presentation Assignment (Group Member 4): Presentations due Thursday at 6pm; Responses due Friday at 6pm</p>	
6	Wednesday	12-Feb	<p>At the Movies: How well do people remember details at the scene of a movie? Does it impact how the story is interpreted?</p>	<p>Smith T J, Lamont P, Henderson J M. (2013). Change blindness in a dynamic scene due to endogenous override of exogenous attentional cues. <i>Perception</i> 42(8) 884-886.</p> <p>Levin, D. T., Baker, L. J., Wright, A. M., Little, J. W., & Jaeger, C. B. (2022). Perceiving versus scrutinizing: Viewers do not default to awareness of small spatiotemporal inconsistencies in movie edits. <i>Psychology of Aesthetics, Creativity, and the Arts</i>.</p> <p>Reaction Paper #5 Due</p>
	Online	14-Feb	<p>Video Presentation Assignment (Group Member 5): Presentations due Thursday at 6pm; Responses due Friday at 6pm</p>	

7	Wednesday	19-Feb	***Reading Week***	
	Online	21-Feb		
8	Wednesday	26-Feb	Eye Movements in Real-world Scenes What grabs our attention? How do we prioritize where to look first?	Henderson, J. M. (2017). Gaze control as prediction. <i>Trends in Cognitive Sciences</i> , 21(1), 15-23. Helbing, J., Draschkow, D., & L.-H. Vö, M. (2022). Auxiliary scene-context information provided by anchor objects guides attention and locomotion in natural search behavior. <i>Psychological Science</i> , 33(9), 1463-1476. Reaction Paper #6 Due
	Online	28-Feb	Video Presentation Assignment (Group Member 1): Presentations due Thursday at 6pm; Responses due Friday at 6pm	
9	Wednesday	05-Mar	Marketing and Ads	Kaspar, K., Weber, S. L., & Wilbers, A. K. (2019). Personally relevant online advertisements: Effects of demographic targeting on visual attention and brand evaluation. <i>PloS one</i> , 14(2), e0212419. Beuckels, E., Hudders, L., Cauberghe, V., Bombeke, K., Durnez, W., & Morton, J. (2021). To fit in or to stand out? An eye-tracking study investigating online banner effectiveness in a media multitasking context. <i>Journal of Advertising</i> , 50(4), 461-478. Reaction Paper #7 Due
	Online	07-Mar	Video Presentation Assignment (Group Member 2) Presentations due Thursday at 6pm; Responses due Friday at 6pm	

10	Wednesday	12-Mar	***No Class***	
	Online	14-Mar	***No Video Presentation Assignment***	
			Research Proposal Idea Due Proposal Idea Summary Due (Friday Mar 14 at 11:59PM)	
11	Wednesday	19-Mar	Detecting Deepfakes How do you tell what's real from what's fake? Are there differences in conscious and unconscious processing?	Köbis, N. C., Doležalová, B., & Soraperra, I. (2021). Fooled twice: People cannot detect deepfakes but think they can. <i>Iscience</i> , 24(11). Jin, X., Zhang, Z., Gao, B., Gao, S., Zhou, W., Yu, N., & Wang, G. (2023). Assessing the perceived credibility of deepfakes: The impact of system-generated cues and video characteristics. <i>New Media & Society</i> , 0(0). Reaction Paper #8 Due
	Online	21-Mar	Video Presentation Assignment (Group Member 3): Presentations due Thursday at 6pm; Responses due Friday at 6pm	
12	Wednesday	26-Mar	Navigation, Spatial Perception in VR How does movement around a scene affect how you represent space?	Pastel, S., Chen, C. H., Bürger, D., Naujoks, M., Martin, L. F., Petri, K., & Witte, K. (2020). Spatial orientation in virtual environment compared to real-world. <i>Journal of Motor Behavior</i> , 53(6), 693–706. De Back, T.T., Tinga, A.M. & Louwerse, M.M. Natural- and redirected walking in virtual reality: Spatial performance and user experience. <i>Multimed Tools Appl</i> (2024).

				Reaction Paper #9 Due
	Online	28-Mar	Video Presentation Assignment (Group Member 4): Presentations due Thursday at 6pm;	
			Responses due Friday at 6pm	
13	Wednesday	02-Apr	Driving What do you pay attention to when you drive? What happens in more complex environments? What about distractions?	Grahn, H., & Kujala, T. (2020). Impacts of Touch Screen Size, User Interface Design, and Subtask Boundaries on In-Car Task's Visual Demand and Driver Distraction. <i>International Journal of Human-Computer Studies</i> , 142, 102467. Wood, G and Hartley, G and Furley, P and Wilson, MR (2016) Working Memory Capacity, Visual Attention and Hazard Perception in Driving. <i>Journal of Applied Research in Memory and Cognition</i> , 5(4), 454-462. Reaction Paper #10 Due
	Online	04-Apr	Video Presentation Assignment (Group Member 5): Presentations due Thursday at 6pm; Responses due Friday at 6pm	
			Final Paper Due (Wednesday April 9)	