

# Visual Cognition in the Real World

(aka Selected Topics in Real-World Scene Perception)

## PSYC423 – Fall 2021

Syllabus

In-Person Discussions: Wednesday, 11:30am-1:00pm

MACINTOSH-CORRY RM D122

(COVID-19 Changes: will change to Zoom sessions, if in-person classes suspended)

### *General Course Information*

PSYC 423 – Visual Cognition in the Real World

Fall 2021 (September 7, 2021 – December 3, 2021)

3 credits

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

Blended Modality (on campus and online): To cope with possible future COVID-19 restrictions, this course will be blended. In-class discussions and asynchronous online presentations.

### *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 Castelhana

Office address: Craine Bldg, rm 409

Office hours: Tuesdays 11:00am-12:00pm (subject to change; please see onQ for updates)

Telephone number: 613-533-3266 (I don't use my phone, so just email)

Email: monica.castelhana@queensu.ca

About me: I have been teaching this course for a long time, but it still excites me to see what cutting edge research is being done across these areas. I hope to share this enthusiasm with you and to show you how many ways Cognitive Psychology applies to your everyday lives.

### *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 7pm, 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 5pm, one person from each group will be assigned as the presenter and will post a video of describing a new study on the topic for that week
- Every **Friday** by 5pm, 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 the thoughts of your reaction paper during the Wednesday discussion. Then, each week you will participate as *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 Flipgrid Assignment.

### *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! Participating and presenting go hand-in-hand and speaking up in class will help make the class more interesting. All criticisms, comments, and questions about the readings and topics are encouraged. You will be graded for your participation in the course, both for the in-person discussions and for the online video assignments.

#### **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 7pm 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 11, so the bottom grade is dropped.

***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.

### **FlipGrid Presentation/Response Videos**

As a presenter, you will lead discussion for your group. These will be conducted online via Flipgrid. For each presentation, you will choose a new article related to that week's topic and provide a ~5 **minute summary presentation via Flipgrid**. Flipgrid offers a platform to present a topic video and then response videos. The class will be divided into groups and you will comment on each other's presentations. To help with the summary, each presenter is to provide a **one-page handout** with key figures and list 2-3 questions that your group members can think about and include in their response. These handouts and a copy of your chosen article are to be uploaded on onQ (under Assignments for the Presentation number). The uploads and the presenter's video must be posted by **Thursday at 5pm** and each group members' response must be posted by **Friday at 5pm**.

**How it will work:** Each week I will send an invitation link to all presenting members of each group. At 5pm on Thursday, the link will be posted to the class. These videos will be a max 5 min long.

- **Presentation Videos:** For presenters, summarize the main question, experiment task and the main pattern of results. Then present 2-3 questions for your fellow group members to respond to and comment on. **Label your video with your name and Group Letter (A-D).**
- **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, but are also free to comment on others. 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 process may be updated as we go.*

### **Class Discussion Guidelines (in-class and online)**

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](mailto: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 Dec 8<sup>th</sup> at 5pm**, 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. 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 Nov 12<sup>th</sup> at 5pm**. This half-page summary will be included in your research proposal grade (submit under Assignments on onQ).

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

*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. Assignment submission folders will close 72 hours after the assignment deadline and assignments not submitted by that time will receive a '0' will apply. Short term academic consideration is therefore built into all assignment due dates and will not be extended past this 3-day grace period.*

### *Evaluation*

Class Participation	20%
Reaction Papers	20%*
Presentations	25%
Research Proposal	35%

\*Best 9 out of 11 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***

<b>Grade</b>	<b>Numerical Course Average (Range)</b>
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](http://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 of their academic activities. The Senate Policy for Accommodations for Students with Disabilities was approved at Senate in November 2016 (see <https://www.queensu.ca/secretariat/sites/webpublish.queensu.ca.uslcwww/files/files/policies/senateandtrustees/ACADACCOMMPOLICY2016.pdf>). 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 at: <http://www.queensu.ca/studentwellness/accessibility-services/>

### *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 Timeline

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-Sep	<b>First in-class meeting and Introduction to Visual Cognition in Real World</b>	
2	Wednesday	15-Sep	<b>Initial Perception of Scenes</b>	<p>Intraub, H. &amp; Richardson, M. (1989). Wide-angle memories of close-up scenes. <i>Journal of Experimental Psychology: Learning, Memory, and Cognition</i>, 15, 179-187.</p> <p>Bainbridge, W. A., &amp; Baker, C. I. (2020). Boundaries extend and contract in scene memory depending on image properties. <i>Current Biology</i>, 30(3), 537-543.</p> <p><b>Reaction Paper #1 Due</b></p>
	Online	17-Sep	<b>Flipgrid Assignment (Group Member 1): Presentations due Thursday at 5pm; Responses due Friday at 5pm</b>	



3	Wednesday	22-Sep	<b>Memory for Scenes</b>	<p>Konkle, T., Brady, T. F., Alvarez, G. A., &amp; Oliva, A. (2010). Scene memory is more detailed than you think the role of categories in visual long-term memory. <i>Psychological Science, 21</i>(11), 1551-1556.</p> <p>Bainbridge, W. A., Hall, E. H., &amp; Baker, C. I. (2019). Drawings of real-world scenes during free recall reveal detailed object and spatial information in memory. <i>Nature communications, 10</i>(1), 1-13.</p> <p><b>Reaction Paper #2 Due</b></p>
	Online	24-Sep	<b>Flipgrid Assignment (Group Member 2): Presentations due Thursday at 5pm; Responses due Friday at 5pm</b>	
4	Wednesday	29-Sep	<b>Photos and False Memories</b>	<p>Nash, R. A. (2018). Changing beliefs about past public events with believable and unbelievable doctored photographs. <i>Memory, 26</i>(4), 439-450.</p> <p>Wilson, J. C., &amp; Westerman, D. L. (2021). Framing the past (and future): Effects of generic photos on autobiographical judgments. <i>Memory &amp; Cognition, 1-16</i>.</p> <p><b>Reaction Paper#3 Due</b></p>
	Online	01-Oct	<b>Flipgrid Assignment (Group Member 3): Presentations due Thursday at 5pm; Responses due Friday at 5pm</b>	

5	Wednesday	06-Oct	<p><b>On-Line Scene Representations</b> How much do you really see as you look around?</p>	<p>Rensink, R. A., O'Regan, J. K., &amp; 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>Solomon, T., Hasanzadeh, S., Esmaeili, B., &amp; Dodd, M. D. (2021). Impact of Change Blindness on Worker Hazard Identification at Jobsites. <i>Journal of Management in Engineering</i>, 37(4), 04021021.</p> <p><b>Reaction Paper #4 Due</b></p>
	Online	08-Oct	<p><b>Flipgrid Assignment (Group Member 1): Presentations due Thursday at 5pm; Responses due Friday at 5pm</b></p>	
6	Wednesday	13-Oct	<p><b>***FALL BREAK***</b></p>	
	Online	15-Oct		
7	Wednesday	20-Oct	<p><b>At the Movies:</b> 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>Smith, T. J., &amp; Martin-Portugues Santacreu, J. Y. (2017). Match-action: The role of motion and audio in creating global change blindness in film. <i>Media Psychology</i>, 20(2), 317-348.</p> <p><b>Reaction Paper #5 Due</b></p>
	Online	22-Oct	<p><b>Flipgrid Assignment (Group Member 2): Presentations due Thursday at 5pm; Responses due Friday at 5pm</b></p>	

8	Wednesday	27-Oct	<p><b>Eye Movements in Real-world Scenes</b></p> <p>How do we know where to look first?</p>	<p>Henderson, J. M. (2017). Gaze control as prediction. <i>Trends in Cognitive Sciences</i>, 21(1), 15-23.</p> <p>Lalla, A., Agostino, C., &amp; Sheldon, S. (2020). The link between detail generation and eye movements when encoding and retrieving complex images. <i>Memory</i>, 28(10), 1231-1244.</p> <p><b>Reaction Paper #6 Due</b></p>
	Online	29-Oct	<p><b>Flipgrid Assignment (Group Member 3):</b>  <b>Presentations due Thursday at 5pm; Responses due Friday at 5pm</b></p>	
9	Wednesday	03-Nov	<p><b>Marketing and Ads</b></p>	<p>Pieters R. &amp; Wedel, M. (2007). Goal Control of Attention to Advertising: The Yarbus Implication. <i>Journal of Consumer Research</i>, 34, 224-233.</p> <p>Kaspar, K., Weber, S. L., &amp; 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.</p> <p><b>Reaction Paper #7 Due</b></p>
	Online	05-Nov	<p><b>Flipgrid Assignment (Group Member 1):</b>  <b>Presentations due Thursday at 5pm; Responses due Friday at 5pm</b></p>	

10	Wednesday	10-Nov	<p><b>Searching Through Scenes</b> How do you quickly and accurately find what you're searching for?</p>	<p>Hayes, T. R., &amp; Henderson, J. M. (2019). Scene semantics involuntarily guide attention during visual search. <i>Psychonomic bulletin &amp; review</i>, 26(5), 1683-1689.</p> <p>Boettcher, S. E., Draschkow, D., Dienhart, E., &amp; Vö, M. L. H. (2018). Anchoring visual search in scenes: Assessing the role of anchor objects on eye movements during visual search. <i>Journal of Vision</i>, 18(13), 11.</p> <p><b>Reaction Paper #8 Due</b></p>
	Online	12-Nov	<b>***No Flipgrid Assignment***</b>	<p><b>Research Proposal Description Due (Friday Nov 12 at 5pm)</b></p>
11	Wednesday	17-Nov	<p><b>Radiology and Search</b></p>	<p>Drew, T., Cunningham, C., &amp; Wolfe, J. M. (2012). When and why might a computer-aided detection (CAD) system interfere with visual search? An eye-tracking study. <i>Academic radiology</i>, 19(10), 1260-1267.</p> <p>Du-Crow, E., Astley, S. M., &amp; Hulleman, J. (2019). Is there a safety-net effect with computer-aided detection? <i>Journal of Medical Imaging</i>, 7(2), 022405.</p> <p><b>Reaction Paper #9 Due</b></p>
	Online	19-Nov	<p><b>Flipgrid Assignment (Group Member 2): Presentations due Thursday at 5pm; Responses due Friday at 5pm</b></p>	

12	Wednesday	24-Nov	<p><b>Navigation and Spatial Perception in Scenes</b></p> <p>How does movement around a scene affect how you represent the scene?</p>	<p>Brown, T. I., Gagnon, S. A., &amp; Wagner, A. D. (2020). Stress disrupts human hippocampal-prefrontal function during prospective spatial navigation and hinders flexible behavior. <i>Current Biology</i>, 30(10), 1821-1833.</p> <p>van der Ham, I. J., Claessen, M. H., Evers, A. W., &amp; van der Kuil, M. N. (2020). Large-scale assessment of human navigation ability across the lifespan. <i>Scientific Reports</i>, 10(1), 1-12.</p> <p><b>Reaction Paper #10 Due</b></p>
	Online	26-Nov	<p><b>Flipgrid Assignment (Group Member 3):</b>  <b>Presentations due Thursday at 5pm; Responses due Friday at 5pm</b></p>	
13	Wednesday	01-Dec	<p><b>Driving</b></p> <p>What do you pay attention to when you drive? What happens in more complex environments? What about distractions?</p>	<p>Grahn, H., &amp; 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.</p> <p>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.</p> <p><b>Reaction Paper #11 Due</b></p>
	Online	03-Dec	<p><b>***No Flipgrid Assignment***</b>  Research Proposal due next week:  Wednesday, December 8<sup>th</sup> at 11:59pm</p>	