LMC 6650 Project Studio: Critical Making with Emotion ML
Fall 2021
Units: 3

Course Meeting
Tuesdays 12:30 - 3:15pm
TSRB 323 / BlueJeans https://gatech.bluejeans.com/437857222

Instructor
Noura Howell, PhD
Assistant Professor
Digital Media
Georgia Tech
nhowell8@gatech.edu
https://nourahowell.com/
she / her / hers

Important Links
BlueJeans meeting
Slack: HAPPYHAPPENINGS - shared slack with architecture project studio
Google Drive (Note: If at any point I ask you to access or edit a file and Google Drive says you
don't have permission, please email me to let you know so I can go fix the Google Drive
permissions.)

Office hours by appointment, set up an appointment via email. I do not monitor Canvas
messages or MS Teams regularly. The best way to set up an appointment for office hours with
me is via email.

Course Description
Emotion ML analyzes facial imagery to classify emotion. It is increasingly used in many
contexts, such as hiring decisions, tracking student attention, and lie detection, pulling data from
cameras in the built environment. Some computing experts expound benefits of emotion ML for
societal well-being and smart cities, while other computing experts critique emotion ML for being
culturally reductive and threatening civil liberties via surveillance. Interdisciplinary perspectives
are needed to help shape the future of this emerging technology. This class will consider
emotion ML from technical, designerly, and ethical perspectives.

This Project Studio course will explore emotion ML through critical making to raise awareness,
spark critical reflection and ethical discussion, and imagine alternative futures for emotion ML.
The class will culminate in final projects of an exhibition of interactive art with emotion ML.

These interactive art installations will involve remote collaboration with architecture students
who are creating inflatables, sewn textiles inflated with fans. Inflatables techniques can produce
large pop-up lightweight structures in unusual shapes. Digital Media students will focus on

designing creative interactions with emotion ML, while architecture students will focus on creating inflatable forms.

Students in this Project Studio will take a mini deep dive into the basics of how ML works, because this technical grounding helps think about the capabilities and limitations of emotion ML. Students will be provided with working code examples in Python of existing emotion ML systems to tinker with, and will independently adapt this code for the final projects. No background in mathematics or programming is required, just a willingness to learn. As a Digital Media Project Studio, the focus is on designing creative interactions with emotion ML that help raise awareness and prompt critical reflection on this technology.

This Project Studio offers unique challenges and opportunities. The remote collaboration with practitioners in another discipline offers project-based learning where students can create something neither discipline could do alone.

This is a remote collaboration. Creating the final projects will involve travel to North Carolina once or twice during the semester to collaborate with the architecture students. The instructor will assist with travel arrangements and health precautions as needed. Note, travel is not strictly required, and individual circumstances will be considered. The course will adapt to ongoing circumstances. Everything in this course description, syllabus, and the class itself is subject to change as needed to comply with all institutional and governmental guidelines, policies, and laws.

Technology use
Bring a computer to class every day. No use of cell phones (including texting) in class.

Inclusivity Statement
The Ivan Allen College of Liberal Arts supports the Georgia Institute of Technology's commitment to creating a campus free of discrimination on the basis of race, color, religion, sex, national origin, age, disability, sexual orientation, gender identity, or veteran status. We further affirm the importance of cultivating an intellectual climate that allows us to better understand the similarities and differences of those who constitute the Georgia Tech community, as well as the necessity of working against inequalities that may also manifest here as they do in the broader society.

Attendance
Three absences are allowed. Each additional absence lowers the student's overall grade by 5%. Health reasons and personal or family emergencies count as excused absences. Please communicate with the instructor in advance if you are missing a class. Stay home if you feel sick, to protect yourself and others. It is the student's responsibility to learn the material that was covered when they were absent.

Accommodations

Please refer to the [Office of Disability Services](#) for information on how to request [accommodations](#).

Goals
The projected learning outcomes of this course are:
- Apply a high-level understanding of emotion ML to (a) critically analyzing social implications of ML systems and (b) designing creative interaction with emotion ML
- Design and build interactive emotion ML systems
- Imagine alternative possibilities with emotion ML

Textbooks
There is no singular textbook. All readings will be provided virtually.

Schedule
Note, changes to the schedule may occur. Stay tuned for in-class announcements, Canvas, and email updates. Readings for each class day and assignment details will be released as we go along.

Date | Week # | Topic | Coding (projected) | Deliverables

Date	Week #	Topic	Coding (projected)	Deliverables
Tue Aug 24	1	Introductions: Emotion ML, Interactive Inflatables	Online demos of emotion ML: Morphcast, Enablex, Google Vision	
Tue Aug 31	2	How Does ML Work? I	Colab Face Detection and Emotion ML with Google Cloud Vision API	**1-2 min presentation on Emotion ML Tech Company**
Tue Sep 7	3	How Does ML Work? II	Teachable Machine, Colab Emotion ML Repeated Sampling	2 rough sketches of project interaction ideas
Tue Sep 14	4	How Does Facial Recognition Work? I + Introduce projects	raspberry pi hello world, explore different inputs & outputs	**1-2 min presentation on Interactive Art Piece**
Tue Sep 21	5	How Does Facial Recognition Work? II	raspberry pi + camera input	2 rough sketches of project interaction ideas
Tue Sep 28	6	How Does Emotion ML Work? I	raspberry pi + camera + emotion ML	**Project Interaction Individual Brainstorm (w/ prior sketches)**
Tue Oct 5	7	How Does Emotion ML Work? II	raspberry pi + sound output	**Project Interaction Group Brainstorm**
Tue Oct 12	8	*Fall break - no class*		
Tue Oct 19	9	Technology Development & Interaction Design		

Tue Oct 26	10	cont'd		**Tech demo**
Tue Nov 2	11	cont'd		
Tue Nov 9	12	cont'd		**BMC+AC Exhibition Nov 12-14**
Tue Nov 16	13	Final exhibition		
Tue Nov 23	14	Project documentation	TensorFlow example code (TBD)	
Tue Nov 30	15	Project documentation	TensorFlow example code cont'd (TBD)	
Tue Dec 7	16	Project documentation		**Final Exhibition on Campus (TBD?), Documentation due**

Grading

Assignment	% of final grade
1-2 min presentation on Emotion ML Tech Company	5%
1-2 min presentation on Interactive Art Piece	5%
Project Interaction Individual Brainstorm	5%
Project Interaction Group Brainstorm	5%
Tech demo	10%
BMC+AC Exhibition	20%
Final Exhibition on Campus	20%
Project Documentation	20%
Class Participation	10%

Topic of Interest Presentation: 3% extra credit

100-90% : A
89 - 80% : B
79 - 70% : C
69 -   : D

Grading of each assignment will be by percentage. Assignments are due at the beginning of the class session unless otherwise specified. Late submissions lead to automatic grade deductions unless a valid excuse is provided and proactively communicated. 1 day late will reduce the grade by 10%, 2 days late will reduce the grade by 20%, 3 days late will not be accepted. The [Georgia Tech Honor Code](#) applies.

Workload
Students are expected to work not only in class but also outside regular class meetings on assignments and projects. Coordinating with architecture students outside of class time will be essential. This class requires actually making something that 'works' in conjunction with the architecture students, for the exhibition in November.

If you are experiencing anxiety or depression or a medical, personal, or family crisis, or if you just feel overwhelmed, please do not hesitate to reach out for help. Everybody needs help sometimes, and college can be a personally challenging time. You are not alone, and many of us are available to be sympathetic listeners and to share our own strategies for coping with stressful situations. In addition, professional counselors and medical practitioners have expertise that can be very helpful. The Dean of Students has a list of services (see https://studentlife.gatech.edu/content/get-help-now).