CMPT 419 - D100 Spec.Topics/Artificial Intell.

Instructor(s): Angelica Lim
SFU Burnaby

Calendar Objective/Description:
Spec.Topics/Artificial Intell.

Instructor's Objectives:

Emotions play a central role in our daily lives as humans. The field of affective computing studies how emotions can have a major impact in the construction of interactive, intelligent agents and interfaces. This course will cover topics in affective computing as follows. First, theories and models of emotion (including core affect, mood, feelings) from psychological, neuroscientific and computational perspectives will be reviewed. Secondly, we will study techniques for automatic perception of human internal state, including using machine learning to understand sentiment using modalities such as gaze, posture, speech, text, movement and music. Thirdly, synthesis and expression of emotion and empathy in virtual agents, robots, chatbots and synthetic characters will be explored. Finally, we will delve into the implementation of emotion theories, including how to use the above techniques to make more believable, effective, enjoyable, and useful intelligent interactive systems. Pre-requisite: CMPT 310.

**Students will need access to a computer and internet to complete this course. Two 50-minute lectures will be delivered in real-time via BBCollaborate Ultra during scheduled lecture hours. Recordings of lectures will be posted after each class. Online activities will replace one hour of lecture per week, and participation in online discussions will contribute toward the final mark.

Written work for this course will be submitted via Turnitin, a third-party service licensed for use by SFU. Turnitin is used for originality checking to help detect plagiarism. Students will be required to create an account with Turnitin, and to submit their work via that account, on the terms stipulated in the agreement between the student and Turnitin. This agreement includes the retention of your submitted work as part of the Turnitin database. Any student with a concern about using the Turnitin service may opt to use an anonymous identity in their interactions with Turnitin. Students who do not intend to use Turnitin in the standard manner must notify the instructor at least two weeks in advance of any submission deadline. In particular, it is the responsibility of any student using the anonymous option (i.e., false name and temporary email address created for the purpose) to inform the instructor such that the instructor can match up the anonymous identity with the student.

Prerequisites:
see go.sfu.ca

Topics:
- Psychological theories of emotion
- Neuroscientific perspectives of emotion
- Physiology of emotion
- Computational models of affect
- Robots / agents that "have" emotion
- Multimodal affect recognition
- Expression of emotion by robots / agents / synthetic characters
- Social signal processing
- Speech/sound processing and synthesis
- Visual processing of human behaviour
- Affect detection in text
- Affect elicitation and user studies
- Machine empathy
- Ethical implications of affective computing
- Applications in socially interactive systems

**Grading:**
Grading (subject to change): Online participation: 10% Assignments: 45% Final group project: 45%

**Recommended Books:**
Affective Computing, Picard, R. W, MIT PRESS, 2000, 9780262661157

**Academic Honesty Statement:**
Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct Policies (http://www.sfu.ca/policies/gazette/student.html).