CS 4462 Syllabus (cross listed with CS 7462)

Animal-Centered Computing
Fall 2026

Instructor Information

Instructor	**Email**
Melody Jackson	melody@cc.gatech.edu

General Course Information

Description

Can animals use computers? How can technology help animals communicate, monitor their health, enable them to have jobs, keep them safer, and enrich their lives? In this course, we will examine the nascent field of Animal-Centered Computing, covering the latest research in technology for understanding animal cognition, animal communication, animal welfare, behavior-recognition, and strategies for conservation. As background, we will examine animal training techniques such as classical and operant conditioning and shaping, contrasting them to "traditional" training methods. We will examine a variety of animal domains, including pets, livestock, captive wild animals, and animals in natural wild environments. The course will survey the animal interaction literature, including enrichment and games, remote communication technologies, and wellness monitoring between humans and animals. Our goal is to explore the possibilities of technology to improve animal lives, and to mediate and improve human-animal relationships.

Course Learning Outcomes

Upon successful completion of this course, students should be able to:

- Understand the state of the art in Animal-Centered Computing for domestic animals, captive wild animals, and wild animals in nature (what is the history of animal interaction, and how can technology be used to benefit animals and human-animal relationships?)
- Comprehend aspects of animal training and communication and begin to understand animal cognition (how do animals' minds work compared to humans? How do we train animals kindly and effectively using operant conditioning and positive reinforcement?)
- Explain how Human-Computer Interaction methods and techniques can be adapted or evolved (how do you get qualitative data from a non-human user? Can animals participate in design?)
- Understand how technology can be used to monitor animals' health and keep them safe (how is computing used in conservation, and how is it used for medicine?)
- Discuss ethics in the context of animals and technology (how can animals consent to participate in research? How can animals opt out of a study?)

Required Course Materials

We will read a number of papers during the semester that describe the latest research in Animal-Centered Computing. We will also read a short book (PDF is in the readings on canvas):

- *Reaching the Animal Mind*, Karen Pryor

Other recommended (but not required) books that we will discuss during the semester:

- *Chasing Doctor Dolittle: Learning the Language of Animals*, Con Slobodchikoff, Ph.D.
- *The Genius of Dogs*, Brian Hare Ph.D. and Vanessa Woods.
- *Survival of the Friendliest,* Brian Hare, Ph.D. and Vanessa Woods.
- *How to Speak Dog,* Stanley Coren Ph.D.
- *How Dogs Love Us*, by Greg Berns, Ph.D.
- *Animals in Translation,* Temple Grandin, Ph.D.
- *Dog Behavior, Evolution, and Cognition,* Adam Miklosi, Ph.D.
- *Zoo Animals: Behavior, Management, and Welfare,* Geoff Hosey, Vicky Melfi et al
- *Successful Dog Adoption,* Sue Sternberg
- *Dogs are from Neptune,* Jean Donaldson

Grading Policy:

Assignment	Weight (Percentage, points, etc)
Project (components P1, P2, P3, P4, P5)	30%
Homework assignments (4)	20%
Midterm	20%
Final (not cumulative)	20%
Attendance and participation (including quizzes over readings)	10%

Description of Graded Components

Project Prototype
Each student will develop an animal-related technology project as their major deliverable this semester. Students may work in teams of up to 4 people. The team will design and implement an interface that facilitates interaction with the animal(s) of their choice. Each project will produce a working animal-centered technology prototype. Students will evaluate the technology to the extent allowed by the IACUC. The written deliverables for the project include:
P1 - Project concept – idea and brief description of the problem domain; preliminary approach to be explored. IACUC mock application. (10%)

P2 – Requirements – more detailed project description; related work from the literature; motivation; significance; experiment design; plan of work (20%)

P3 – Prototyping - Design and implementation of interaction technology: design alternatives; approach; description of prototype. Design pilot study of your technology – methods; protocol; data to be collected; analysis methodologies (40%)

P4 – Evaluation – Conduct usability study or experiment, collect and analyze data, produce paper describing results and conclusions (20%)

P5 - Presentation to the class (10%)

Homework Assignments

We will have four homework assignments associated with readings and lectures for class. Rubrics for graduate students will contain extra components in addition to the undergraduate assignment.

Midterm Exam

The midterm exam will cover the first half of the course and will be a one-hour test of short answers and essay questions. The exam will be closed book and closed notes, and will be written on paper. No electronic devices (including a cell phone or laptop) may be on your person during any exam. Graduate and undergraduate students will have different tests, with the graduate test being longer and answers expected to be more extensive.

Final Exam

The final exam will cover the second half of the course and will be a one-hour test of short answers and essay questions. The final will be closed book and closed notes, and will be written on paper. As with the midterm, no electronic devices will be allowed. Also Graduate and undergraduate students will have different tests, with the graduate test being longer and answers expected to be more extensive.

Attendance and Participation

Attendance is required unless excused, and we will take attendance. Participation by asking questions and contributing thoughts is encouraged. We will have quizzes over the reading that will count for attendance on those days. Quizzes will be short-answer based on the papers assigned for that class day. Graduate students will have two questions, and undergraduates will have one question. We may also have in-class assignments that will also measure attendance and participation.

Grading Scale

Your final grade will be assigned as a letter grade according to the following standard scale:

A 90-100%
B 80-89%
C 70-79%
D 60-69%
F 0-59%

USG Required Course Policies

Attendance and/or Participation

This will be an active classroom, where you will be expected to participate. I have noticed a drastic difference in the exam performance between students who regularly attend class and those who don't. Therefore, I will count attendance in determining your final grade.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct.

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Core IMPACTS

Not applicable

Additional Georgia Tech Required Policies

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Course Expectations, Policies, and Resources

Pre- &/or Co-Requisites

There are no required pre- or co-requisites, but a background in Human-Computer Interaction (CS 3750 or 6750) and Mobile and Ubiquitous Computing (CS 7470) can be useful.

Collaboration, Group Work, and Use of Generative AI

Homeworks are individual efforts, and projects are team efforts, but any work you turn in must be written in your own hand. In-class tests and exams are to be your own work. All in-class tests and exams will be closed book and notes. Generative AI is not allowed in any form.

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

Late homework will be penalized accordingly. Make-up exams are given for illness, approved Institute activities or religious observances.