Human-Machine Communication (HMC)
COMS930
SP2022

Instructor: Cameron W. Piercy, PhD.
Email: cpiercy@ku.edu
Drop-by hours: T: 11 to 1, W: 10 – 11a, and by appointment:
> https://tinyurl.com/bookwithpiercy

Office: Bailey Hall 6C
Course time/location: Thursday's 4:30 – 7:15 pm, BA401 or on Zoom

Course Overview
HMC marries research from human-robot interaction (HRI), human-computer interaction (HCI), human artificial intelligence interaction (HAII), computer science, and other fields to emphasize the importance of communication in all human-machine processes. HMC values all types of machine interaction (e.g., with robots, artificial intelligences, algorithms, and more). HMC scholarship centers on communication encouraging researchers to focus on how relationships between humans and machine partners unfold through social processes, perceptual dynamics, and interaction. HMC, thus, represents the site of meaning making for both human and machine communication partners.

This course surveys this emerging field to tackle the humanistic, ontological, epistemological, and empirical questions about how humans and machines interact. The course will survey what is known about HMC processes across domains (e.g., journalism, political communication, interpersonal communication, etc.). For the Spring 2022 semester, COMS930 students will have access to a $1,000 pool of research funds from the Institute for Digital Humanities Research (IDRH; https://idrh.ku.edu/) to support completed team projects. Students from across disciplines are invited to join and tackle the complex HMC processes emerging in their own research areas and using any method.

Course Learning Goals and Objectives
By the end of this course, you will be able to:
- Define and conduct research in human-machine communication
- Articulate clear issues associated with human-machine interaction
- Apply theories designed to explain human-machine communication processes

Course Format
This is a graduate level course comprised of both MA and PhD students. The course is discussion based, and all students are expected to have completed the class reading prior to the assigned day. Classes will feature a minimal amount of direct lecture and PowerPoint, and will focus on discussion of key ideas in the articles assigned for a given class and practice through a complete applied research project. We will mix theory and practice, and students are encouraged to bring their own experiences/data/theories into the classroom.

Expectations, Requirements and Grading

This course is a survey of a novel type of communication which is increasingly common across domains (i.e., in interpersonal relationships, at work, in politics, etc.). Students are expected to engage with content beyond their specialization, but also to personalize content from the course to apply to their unique research interests. Overall, the course is laid out to allow students to engage in a research project from proposal to completion.

Specifically, students are invited to (1) draft a letter of intent (no more than 2 pages), (2) write 5 pages on their topic area, (3) together craft a literature review on their topic, (4) engage in study design and execution, and (5) analyze results and craft a discussion. The semester is a short time to accomplish a complete research project, so students will initially present individual ideas and then are invited to work in teams or dyads and class time is dedicated to work on this project.

Writing is a critical part of communication, and in order to be successful in this class, it is important that you communicate clearly and concisely in writing. KU offers a Writing Center where students can obtain help with writing skills and assignments: http://writing.ku.edu/ku-graduate-students. Students are encouraged to take advantage of their tutoring services before handing in any written work.

Your final grade will be allocated between the required course project as follows:
- **Letter of Intent (10%)**
- **Write something (10%)**
- **Literature Review and Method (10% + 5%)**
- **Results (15%)**
- **Discussion (15%)**
- **HMC Assignment (5%)**
- **Participation (Article discussion leadership and in-class discussion; 30%)**
  - **Drafted paper (friendly) review: Uncompensated, like all reviews.**

Participation & Discussion Leadership (20% discussion leadership, 10% participation): Students will be responsible for leading discussion on given days. Students will serve as discussion leaders each class. The discussion leader will provide a summary of the readings for classmates, will pose technical questions to the instructor to clarify the readings, and will offer five to seven critical questions for the class to consider in seminar. The goal is to put the readings in terms which help to generate discussion based on:
> - The objectives of the studies and an overview of the topics covered.
> - Theories addressed in the research
> - Aspects of the design and implementation of the studies
> - Key contributions of the study and questions/issues it provokes
> - Ways in which the reading connects to other research
> - A list of several discussion questions which remain unanswered in the papers

We will follow Amazon rules for discussion; each student leading discussion will be expected to provide a 1-page summary over the topic covered that day and list key questions (both theoretical and methodological). Bullets are encouraged. Your job is to identify key aspects of the readings explained in plain language (your own words, direct quotes should be minimized as

much as possible), and to find common themes, discoveries, controversies, etc., across articles. Include an **opening comment on the connections among the articles. Upload the summary and questions for that day onto Canvas Discussion Forum by the class time.**

Class Activity of HMC Course: You will be asked to create a class activity which can be used in an undergraduate HMC course. This activity should be able to be executed in a standard 60 - 75 minute course. Assignments will become part of a shared repository of activities and the best activity will be used in a course called Problem Solving with Teams and Groups this semester.

Full research project:

Students are encouraged to work in dyads or as a team to complete a research project in the course this semester. This is a big job! My goal is to make the project iterative and incremental. That is, you, your co-authors, and I will work together throughout the semester to build out the idea for the project. The class offers critical waypoints to help develop the paper.

This project will reflect scholarly rigor that could be submitted to a conference commensurate with your interest upon completion of the course. The project will review and summarize/synthesize the existing research pertaining to a subtopic related to the course. It will (1) integrate, synthesize, and/or theorize an original problem or a set of conflicting findings in the field, including a call for the kinds of future research that can help assess the utility of the integration/synthesis/theory; or (2) present original empirical research that will either (a) apply HMC theory and research into a domain or purpose that is previously underdeveloped, and propose or present a test of the effects of that application, (b) address a conflict or theoretical controversy in the HMC literature, and propose or present a critical test that may reconcile the conflict, or (c) conduct an original empirical study that will provide an original extension to some theoretical question in HMC. The paper will likely be around 25 pages in length, not including cover page, abstract, references, and any figures or tables.

Papers need to be prepared according to the guidelines specified in the Publication Manual of the American Psychological Association 7th edition.

You are free to use this as an opportunity to develop ideas you have worked on in other courses or for thesis/dissertation. If you are using an idea, you have worked on in the past, inform Dr. Piercy BEFORE you begin the project: Avoid self-plagiarism.

The term paper is due on **Thursday, May 12th at 10 a.m.**. The whole paper should be complete (including any Figures, Tables, References, and Appendices), using 12-point font, double-spaced, and with 1" margins.

Students will present their term paper on the last day of the course. Presentations will be 10-15 minutes in length, including time for discussion/Q&A. The presentations are meant to be a forum for sharing the knowledge you have developed.

Students are encouraged to consider the potential for a strong secondary analysis of existing datasets. In the past this has been a very fruitful avenue (see Piercy & Lee, 2019 in *NMS* and

Parviz & Piercy, 2021 in *SM+S*). Please spend significant time exploring potential datasets before you settle. There are many publicly available datasets and I want you to find one that fits your interest, needs, and skill. Here are some potential sources of data:

- https://toolbox.google.com/datasetsearch
- http://networkrepository.com
- https://www.redeftiedata.eu/

Grades:
All grades are final. Please do not ask to have your grade changed for reasons other than mathematical error. Applying subjective standards after the fact invalidates the standards applied to the entire class and is unfair to every student.

An incomplete can only be assigned to a student who due to unforeseen (and generally emergency) circumstances cannot finish coursework within the given semester. Students should not assume that they have the option of an I grade; this option will be utilized infrequently and at the professor's discretion.

A note on communication:
- Emails for this class should always start with "COMS930: HMC" as the beginning of the subject.
- Include a salutation
- Sign your emails with your full name.
- Clearly indicate what your question is. The more relevant information you provide, the more helpful and timely my response can be.
- Use full sentences and proper grammar.

University Policies
Religious Holidays: Students observing religious holidays that may require them to miss class periods or scheduled exams, speeches, assignment due dates, etc., should contact Dr. Piercy privately within the first two weeks of class to arrange alternative times for completing assignments and/or have these absences excused. If any schedule change interferes with a religious observance, please contact me as soon as possible for alternative arrangements.

Student accessibility and success: Any student needing accommodations for the course should let the instructor know. The earlier we coordinate any accommodations, the better I can support your learning. Students who need assistance obtaining accommodations may contact Student Access Services in 22 Strong Hall and can be reached at 785-864-4064 (V/TTY). Information about their services can be found at http://www.access.ku.edu. Please contact you instructor privately in regard to your needs in this course.

Mandatory Reporting: With very few exceptions, all employees at the University of Kansas are required to contact the Office of Institutional Opportunity and Access (IOA) at 785-864-6414 or ioa@ku.edu to report incidents of discrimination and sexual harassment, including sexual violence, of which they know or have reason to believe may have occurred. For example, if a student shares information about discrimination or sexual harassment, including sexual violence,

with a faculty or staff member, the faculty or staff member must report the information to IOA. Asking faculty or staff members to keep something "confidential" does not exempt them from the mandatory reporting requirement.

Academic Misconduct: Academic misconduct is a serious offense. Academic misconduct is described in *Article II, Section* 6 of the University Senate Rules and Regulations. You are responsible for knowing the standards of academic conduct. The document is available here: policy.ku.edu/governance/USRR

> *Plagiarism:* Plagiarism is a serious offense. Using the words and ideas of others is borrowing something from those individuals. It is always necessary to identify the original source of supporting information. **You must cite the source of any material, quoted or paraphrased, in both written work and oral presentations.**
> Sometimes writers are uncertain about what to cite. Here are two firm guidelines:
> - If you write word for word what appears in another source, put quotation marks around it and cite the source (author, year, page number).
> - If you borrow and summarize ideas, arguments, data, or other information from another source, cite the source even if you put the material in your own words (author, year).
> - Agreeing with the material does not make it your own; if it originated with someone else, give that person credit according to a formally recognized style. Helpful websites:
>   - http://writing.ku.edu
>   - https://owl.purdue.edu/

Course Readings
Required:
American Psychological Association (2019). *Publication manual of the American Psychological Association* (7th Ed.). Washington, DC: APA.

Optional (but very useful):
Guzman, A. L. (2018). *Human-machine communication: Rethinking communication, technology, and ourselves*. Peter Lang.

Tentative Schedule
**Subject to change based on class needs and demands

January 20th
What is Human Machine Communication?
Guzman, 2018 – *What is HMC anyway?*
Fortunati & A. Edwards, 2020 - *Opening space for theoretical, methodological, and empirical issues in human-machine communication*
Guzman, 2016* – *The messages of mute machines: Human-Machine Communication with industrial technologies.*
Fox & Gambino, 2021 - *Relationship development with humanoid social robots: Applying interpersonal theories to human–robot interaction*
-DH activity (in class): *https://play.aidungeon.io/main/home*

January 27th with conversation with Dr. Andrea Guzman
The Agency Question in HMC
Guzman & Lewis, 2019 - *Artificial intelligence and communication: A human–machine communication research agenda*
A. Edwards, 2018 – *Animals, humans, and machines: Interactive implications of ontological classification*
Piercy et al., in press - *Agency in computer-mediated communication: Bots and U.S. political elections*
Gunkel, 2018* - *The other question: Can and should robots have rights?*

February 3rd
Computers as Social Actors
Nass & Moon, 2000 - *Machines and mindlessness: Social responses to computers*
Gambino et al., 2020 - *Building a stronger CASA: Extending the Computers Are Social Actors paradigm*
Lombard & Xu, 2021 - *Social responses to media technologies in the 21st century: The media are social actors paradigm*
Banks, 2020 – *Theory of mind in social robots: Replication of five established human tests*
Gibbs et al., 2020 - *Negotiating agency and control: Theorizing human-machine communication from a structurational perspective*

2-page Letter of Inquiry/Intent is Due - Individual

February 10th
Biases, heuristics, and machines

Banks et al., 2021 - *The space between: Nature and machine heuristics in evaluations of organisms, cyborgs, and robots*

A. Edward & C. Edwards, 2022 - *Does the correspondence bias apply to social robots?: Dispositional and situational attributions of human versus robot behavior*

Broadbent, 2018 - *Interactions with robots: The truths we reveal about ourselves*

Smedegaard, 2019 - *Reframing the role of novelty within social HRI: From noise to information*

Aroyo et al., 2021 - *Overtrusting robots: Setting a research agenda to mitigate overtrust in automation*

Optional- Das, 2021 - *Subversive AI: Resisting automated algorithmic surveillance with human-centered adversarial machine learning*

February 17th
Machine Learning Bias, Trust, and Decision Processes

Benjamin, 2019*- *Chapter from: Race after technology: The new Jim Code*

Noble, 2018* -*Chapter from: Algorithms of Oppression*

Howard & Borestein, 2018* - *The ugly truth about ourselves and our robot creations: The problem of bias and social inequity*

Yalcin et al., 2022 - *Thumbs up or down: Consumer reactions to decisions by algorithms versus humans*

Optional: Meshbah et al., 2021 – *Whose advice counts more – man or machine? An experimental investigation of AI-based advice utilization*

Optional: Sundar, 2008 - *The MAIN Model: A heuristic approach to understanding technology effects on credibility*

==Writing check in: 5 pages of work - Individual==

February 24th ==Guest conversation with Marco Dehnert==
Sociotechnical Networks

Contractor et al., 2011 – *Multidimensional networks and the dynamics of sociomateriality: Bringing technology inside the network*

Dehnert, 2021* - C*ommunication geographies of human-machine understanding: Entangled agencies, synthetic aesthetics, and machine matterings*

Fisher et al., 2015 – *Searching for explanations: How the internet inflates estimates of internal knowledge*

Ringel & Ribak, 2020* - *'Place a book and walk away': Archival digitization as a socio-technical practice*

Choi et al., 2020* - *Situated automation algorithmic creatures in participatory design*

Optional: Yan et al., 2019 - *Conceptualizing Online Groups as Multidimensional Networks*

==Literature Review (8 pages) due - Team==

March 3rd – ==Guest conversation with Dr. Chad Edwards==
Expectations of and Evaluations by Machines

      C. Edwards et al., 2021 - *Interpersonal impressions of a social robot versus human in the context of performance evaluations*

      C. Edwards et al., 2016 - *Initial interaction expectations with robots: Testing the human-to-human interaction script*

      A. Edwards et al., 2019 - *Initial expectations, interactions, and beyond with social robots*

      Grimes et al., 2021 - *Mental models and expectation violations in conversational AI interactions*

March 10th
Social Presence

      Reeves et al., 2020 - *Social robots are like real people: First impressions, attributes, and stereotyping of social robots*

      Lombard, 2019 – *Presence Past and Future: Reflections on 25 years of Prescence Technology, Scholarship, and Community*

      Ishii et al., 2021 - *Social presence in computer-based receptionists: Experimental study towards organizational automation*

==Methods (and IRB materials, if needed) Due==

SPRING BREAK: March 14th – March 18th

March 24th ==– guest conversation== ==with Dr. Sunny Lee==
Domestic Technologies in our Cities and Homes

      Corbett et al., 2021 – *Voice-activated virtual home assistant use and social isolation and loneliness among older adults*

      Woods, 2018* - *Asking more of Siri and Alexa: feminine persona in service of surveillance capitalism*

      Woods, 2021* - *Smart homes: domestic futurity as Infrastructure*

      Lee et al., 2021 - *Social interactions and relationships with an intelligent virtual agent*

      Lim et al., 2021* - *Social robots on a global stage: Establishing a role for culture during human–robot interaction*

March 31st ==guest conversation with Dr. Bryan Abendschein==
Groups and Support

      Abendschein et al., 2021a – *The influence of agent and message type on perceptions of social support in HMC*

      Page & Gehlbach, 2019 – *How an artificially intelligent virtual assistant helps students navigate the road to college*

      Haggadone et al., 2021 -*Of robots and robotkind: Extending intergroup contact theory to social machines*

      Ling & Björling, 2020 - *Sharing stress with a robot: What would a robot say?*

      Prahl & Van Swol, 2021 - *Out with the humans, in with the machines?: Investigating the behavioral and psychological effects of replacing human advisors with a machine*

April 7th
Ethical Questions and Machines

Banks & Ouytsel, 2020 - *Cybersex with human- and machine-cued partners: Gratifications, shortcomings, and tensions*

Richards et al., 2016 - *Exploration of relational factors and the likelihood of a sexual robotic experience*

Coleman, 2021* - *Leveraging the rhetorical energies of machines: COVID-19, misinformation, and persuasive labor*

Ess, 2019 * – *Ethics in HMC: Recent developments and case studies*

Schmidt, 2016* - *Do digital humanists need to understand algorithms?*
https://dhdebates.gc.cuny.edu/read/untitled/section/557c453b-4abb-48ce-8c38-a77e24d3f0bd#ch48

Optional: Fritz, 2019 * – *Child or product? The rhetoric of social robots*

Due: Assignment idea for undergraduate course focused on HMC

April 14th guest conversation with Dr. Autumn Edwards
Robots and Educational Spaces

Abendschein et al., 2021b - *Human-robot teaming configurations: A study of interpersonal communication perceptions and affective learning in higher education*

A. Edwards et al., 2021 - *Using robot animal companions in the academic library to mitigate student stress*

A. Edwards et al., 2019 - *Robots in the classroom: Differences in students' perceptions of credibility and learning between "teacher as robot" and "robot as teacher"*

Rosenthal-von der Pütten & Hoefinghoff, 2018 - *The more the merrier? Effects of humanlike learning abilities on humans' perception and evaluation of a robot*

April 21st
Machines in News and Politics

Lewis et al., 2019 – *Libel by algorithm? Automated journalism and the threat of legal liability*

Lewis et al., 2019b - *Automation, journalism, and human–machine communication: Rethinking roles and relationships of humans and machines in news*

Chang et al., 2022 - S*ocial bots and social media manipulation in 2020: The year in review*

Risam, 2019* – *New Digital Worlds, Chapter 1: The postcolonial digital record*

April 28th
Work day

Due May 2nd: Draft of final paper for peer reviews

May 5th
Machines in Health and Disability Support

Piercy & Gist-Mackey, 2021 - *Automation anxieties: Perceptions about technological automation and the future of pharmacy work*

Beane, 2019 - *Shadow learning: Building robotic surgical skill when approved means fail.*

Dehnert & Leach, 2019* - *Becoming human? Ableism and control in Detroit: Become Human and the implications for human-machine communication*

Davis & Stanovsek, 2019 - *The machine as an extension of the body: When identity, immersion and interactive design serve as both resource and limitation for the disabled*

Benjamin, 2019* - *Assessing risk, automating racism: A health care algorithm reflects underlying racial bias in society*

May 12th

==***Celebration and final presentations of team papers ***==