CPSC 100

Computational Thinking

Human Computer Interaction

Instructor: Firas Moosvi
Department of Computer Science
University of British Columbia

Agenda

- Course Admin
- Learning Goals
- Human Computer Interaction
  - Introduction + Activity

Course Admin

CPSC 100 Course Project

CPSC 100 Course Project

Class Activity

- Today we will make groups for the project on PrairieLearn!

- I will help guide this process a bit in class…

Considerations for Group Formation

You will be doing this project in teams of 3 or 4, with no exceptions, as all of the milestones and details are designed for that many students.

As you can imagine, there is a fair bit of anxiety associated with group projects but know that this particular group project has several features that should make it possible to deal with any unforeseen circumstances.

There is a little bit of additional work needed to form a team, so we can make sure that all team members are on the same page, and teamwork can happen harmoniously.

Considerations for Group Formation

Considerations when looking for a team

It may be very tempting to do this, but try to avoid making a group with people you already know and have worked with in the past. I know this will be really hard and counter-intuitive, but group dynamics are very tricky and in my experience people that don't know each other from before tend to approach the project and the code of conduct differently.

Consideration 1: Interest in the topic

As I've said, the **most important** thing you should look for in a team member, is an interest in the topic of whatever dataset you end up choosing.

Considerations for Group Formation

Consideration 2: Diversity of knowledge, experience, and skills

Here is a self-assessment form that each members of your group should do.

Traits	Beginner	Novice	Expert
General familiarity with technology			
Programming Experience (any language)			
Presentations and communication			
Organization and Logistics			
Design/Aesthetic skills			
Attention to Detail			

The ideal group would have a healthy mix of traits in each of the group members. It's very unlikely that one person will be an "expert" in everything, and we want to make sure the group experience is such that everyone can learn and benefit in different ways. We are not going to police your groups, but the groups that I "worry about" the most, are those where all members declare themselves as "experts".

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Considerations for Group Formation

Consideration 3: Availability

You should work with group members with whom you can easily find a weekly timeslot to meet, ideally in person and on campus. There is nothing more frustrating than group members who can't find a time to work on things simultaneously. If you are a morning person, try to find others who want to work in the mornings. If you stay up till 3 AM every night, it will likely not make a good match to work with team members who want to meet at 8 AM.

Considerations for Group Formation

Consideration 4: Goals for the project

You should work with group members with shared goals on what your final objective is. Your objective could be as simple as “do the bare minimum to pass the project”, or “do as much as I can given my heavy course and work load” (make sure to define what “as much as I can” means), or “try everything, and aim to do the best I can”, or “my goal is to make something I’m proud of that I can show my future employers”. Consider all those options above and make sure your team members are on the same page.

Q: Which topic are you most interested in (not finalized) ?

A. Generative AI and student learning

B. Technological inequality

C. Algorithmic Bias

D. Financial and Environmental impacts of technology

E. Technology and Crime

Participation Question

What grade do you intend to contract for?

A+

A

B

C

Considerations for Group Formation

- Share contact details with each other, and arrange for an initial meeting (Zoom, phone, instagram live, whatever y'all use these days).
  - I will give you some class time to make the initial contact and exchange information.
- In your initial meeting discuss the following items:
  - What are your interests and goals with this project (datasets, research questions, what you want to learn)?
  - How much time will you be able to dedicate to this project?
  - How frequently will you meet or discuss the project?
  - What are each of your strengths and weaknesses?
  - What will you do if there is a conflict or if issues arises within the team?
  - Do you all agree to stay in touch, and keep everyone informed despite how busy you are? I suggest setting a response time, say a response time of ~ 12-24 hours.
  - Do you think you will be able to work together for this project?
  - I suggest looking over Milestone 1 as a team and coming up with your answers together.
- Once your initial meeting is done and you have answered those questions together, **one person in the team should submit Milestone 1 on Prairielearn** and answer all the questions.

CPSC 100

Computational Thinking

Intro to Human Computer Interaction

Instructor: Firas Moosvi
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Course Admin

Learning Goals

Learning Goals

After this **today's lecture**, you should be able to:

- Describe the **historical evolution** of HCI, highlighting pioneers like Douglas Engelbart and key innovations
- Describe the concept of **IoT** and give concrete examples (e.g., smart thermostats, wearable health devices).
- Distinguish between **AR** and **VR** technologies, and identify key examples (e.g., Google Glass, Meta Quest)
- Define and explain the **five key usability attributes**: learnability, efficiency, memorability, errors, and satisfaction.

Human Computer Interaction

Introduction to HCI

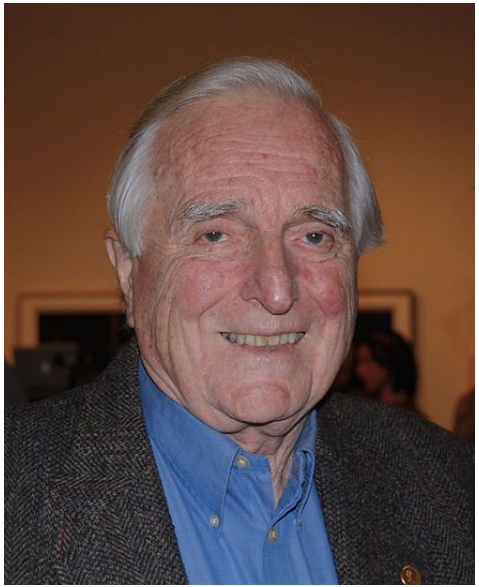
- Human-Computer Interaction (HCI) is the study and practice of **how people interact with computers** and design technologies that let humans engage with digital systems effectively and intuitively.

Where did it start from?

Douglas Engelbart

Douglas Engelbart (1925-2013)

- Founding father of HCI (one of)
- Augmentation Research Center
  - SRI International (Non-profit R&D org)
- Inventions
  - Computer mouse (1968)
  - NLS (oN-Line System - 1960s)



Douglas Engelbart: 2008

Reference: Ivan [Link]

What is challenging us now?

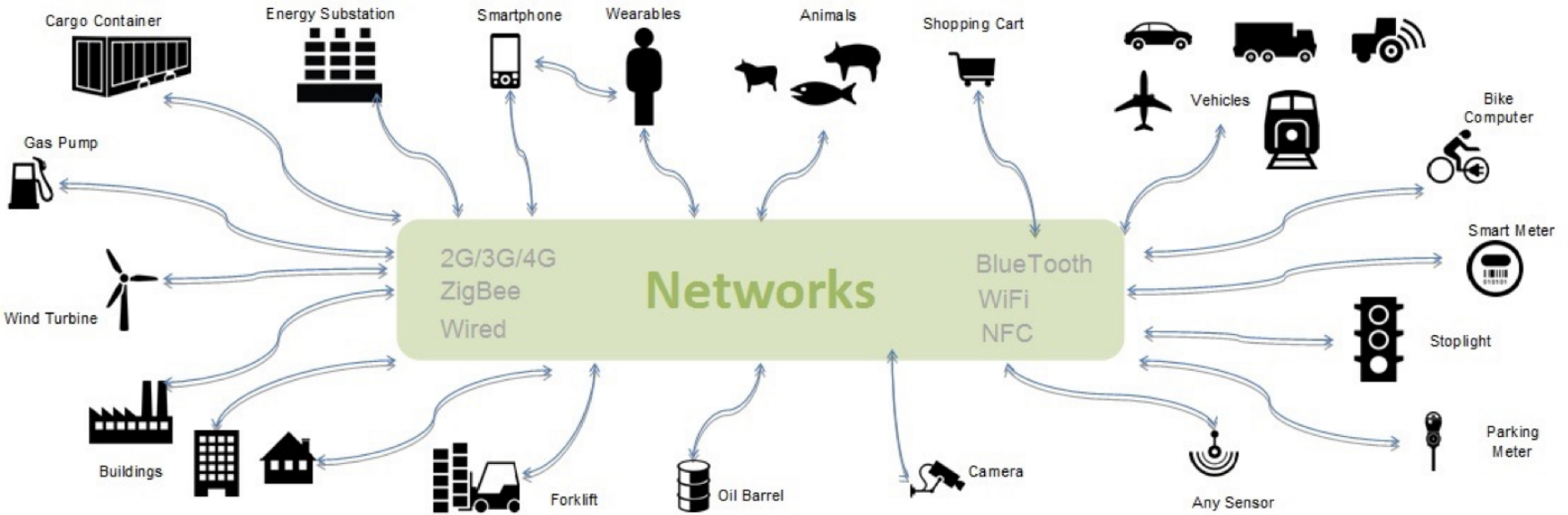

SMART TRACKER
SMART REFRIGERATOR
ASSISTANT SPEAKER
ROBOT CLEANER
SMART KETTLE
SMART SCALE
SMARTHOME SENSOR
COFFEEMACHINE
SMART WASHER
CCTV & IP CAMERA
SMART MICROWAVE
SMART HEATING PRESSURE
SMART SOCKET
SMART STOVE
InterviewBit


ORDER FOOD ONLINE
ARTIFICIAL INTELLIGENCE
Can I Help?

IoT

Internet of Things (IoT)

"**Things**" refer to any physical object with a device that has its **own IP address** and can **connect & send/receive** data via a **network**



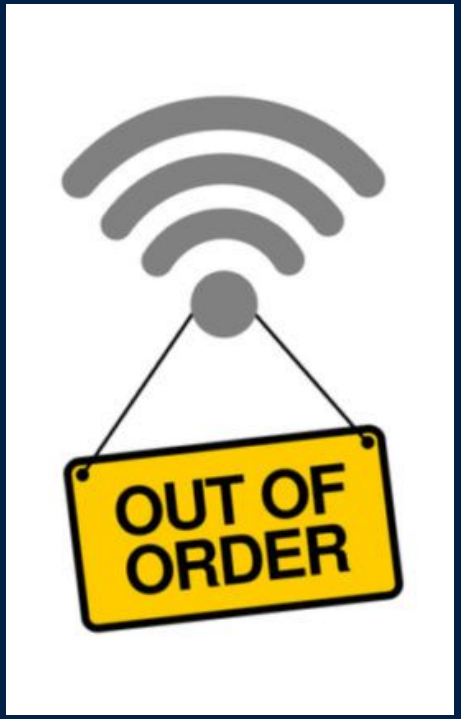
Reference: IBM [Link]

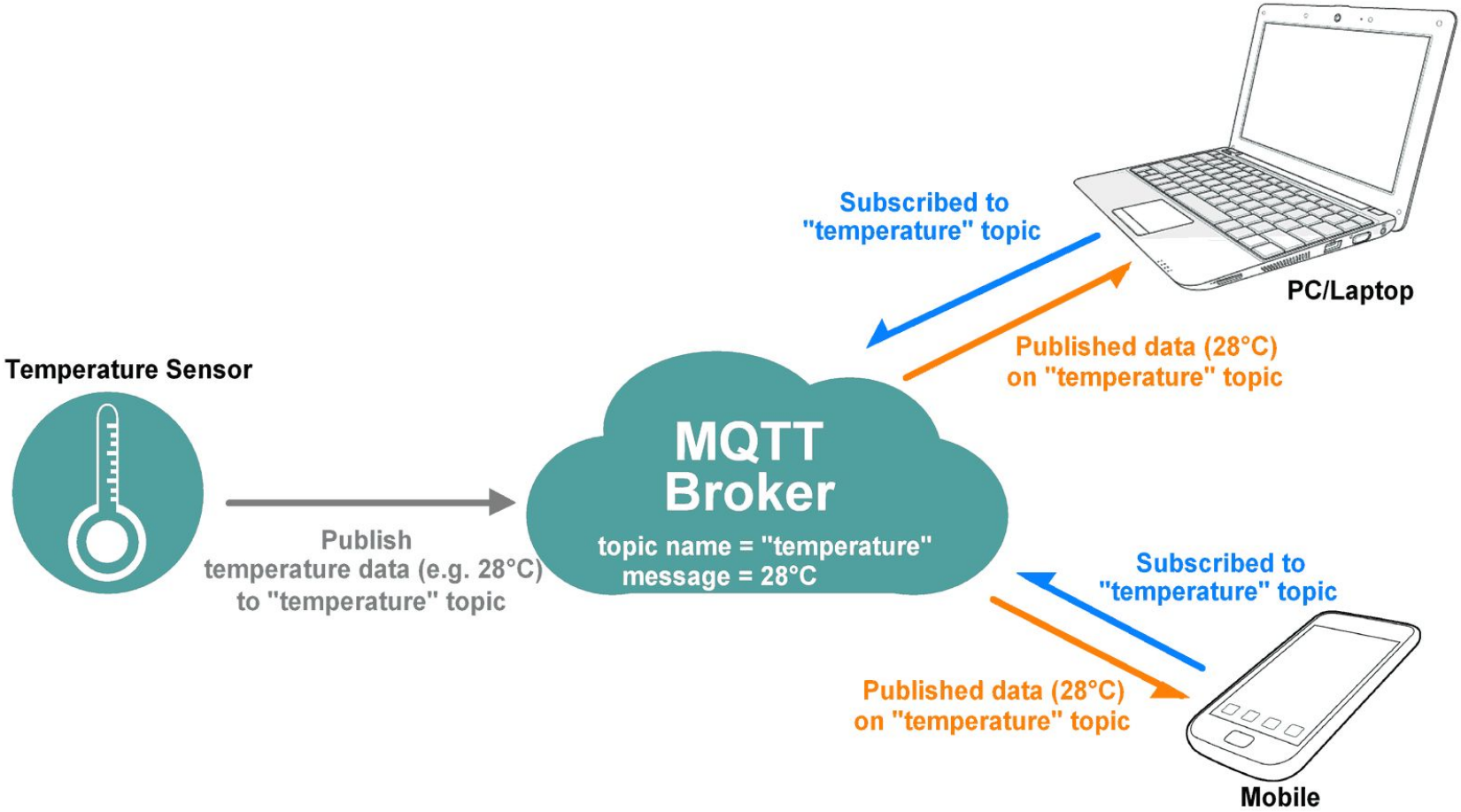
Internet of Things (IoT)

Everyday objects with connectivity, sensing abilities, and increased + embedded computing power.

- Connected home technology
  - Thermostats, lighting, energy monitoring
- Wearables
  - Activity/fitness trackers
- Medical/wellness devices
  - Bathroom scales, blood pressure monitors

What happens to IoT devices when there is no internet?




Subscribed to
"temperature" topic
PC/Laptop
Published data (28°C)
on "temperature" topic
Temperature Sensor
MQTT
Broker
topic name = "temperature"
message = 28°C
Publish
temperature data (e.g. 28°C)
to "temperature" topic
Subscribed to
"temperature" topic
Published data (28°C)
on "temperature" topic
Mobile

AR + VR

Augmented + Virtual Reality

Virtual Reality (VR)

- Use of computers to simulate a real or imagined environment
- Three-dimensional (3-D) space

Meta Quest 2019-now

Augmented Reality (AR)

- Uses an image of an actual place or things that adds digital information to it

Google Glass 2014-15


Introducing
Vision Pro


ORDER FOOD ONLINE
ARTIFICIAL INTELLIGENCE
Can I Help?

How do we *design* for the future?

HCI: User Centered Design

HCI: Usability

- Quality attribute
  - Assesses how easy user interfaces are to use
  - Improving ease-of-use during the design process
- Defined by 5 quality components

HCI: Usability Components

1. Learnability
2. Efficiency
3. Memorability
4. Errors
5. Satisfaction

HCI: Usability Components

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  - How easy is it to learn task the first time?

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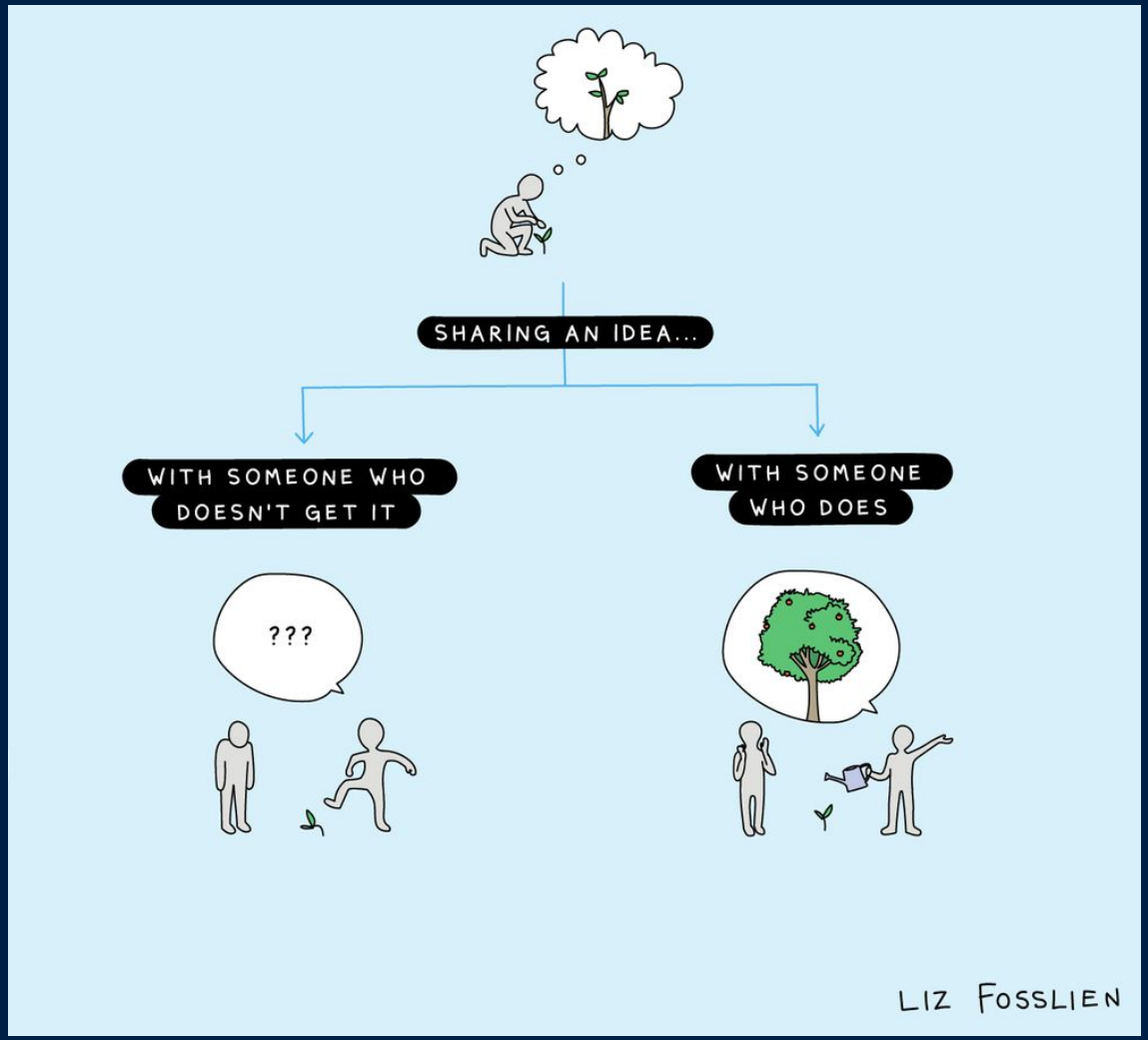
SHARING AN IDEA...
WITH SOMEONE WHO DOESN'T GET IT
WITH SOMEONE WHO DOES
???
LIZ FOSSLIEN