

AI & Teaching Workshop

HMC Engineering Department Workshop

2024-08-22

Workshop Resources

URL: <https://tinyurl.com/muddengai>



QR Code

What tools are part of your classroom community?

- a. Chalkboard
- b. Whiteboard
- c. Slides
- d. Tablet
- e. Think-pair-share

What are the values embedded in these tools?

- a. Chalkboard: historical context, culture, limit speed
- b. Whiteboard: cleanliness, limit speed
- c. Slides: accessibility, efficiency
- d. Tablet: accessibility, limit speed
- e. Think-pair-share: community, conversation

What are the values embedded in Generative Artificial Intelligence?

What is artificial intelligence?

Popular genAI Tools



ChatGPT (OpenAI)



Midjourney



Claude (Anthropic)



Gemini (Google)



Perplexity



Copilot (Microsoft)

Figure 1: Popular generative AI tools.

Key Terms and Concepts

Generative AI is a program capable of generating content like text, images, video, and computer code. Most genAI systems respond to a prompt entered in natural language by a user.

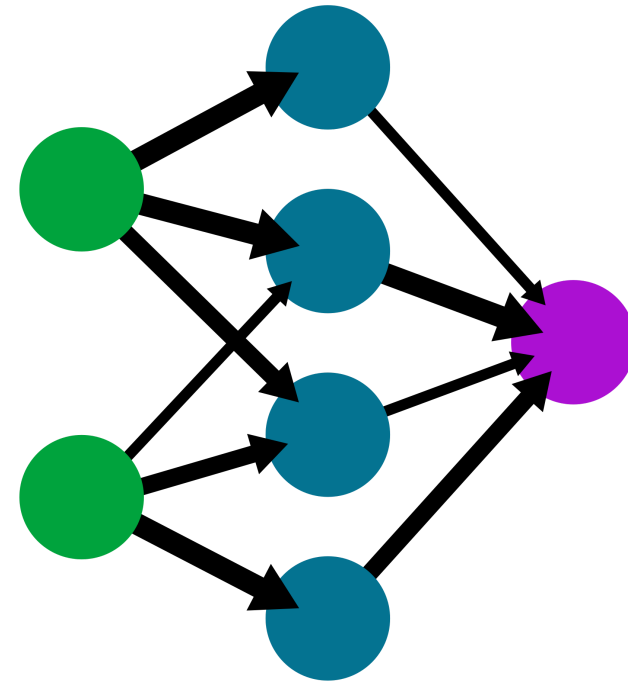
- **Large language model (LLM):** Program that behaves like very sophisticated autocomplete. Examples: [GPT-4](#), [Gemini](#).
- **Generative Pre-trained Transformer (GPT):** The specific architecture (also known as foundation model) of LLM first developed by OpenAI.
- **Multimodal:** The ability to process and generate different types of media. For example, input text and output an image or video. Examples: [Midjourney](#), [DALLE-3](#), [Sora](#).
- **Supervised machine learning:** An machine learning algorithm trained using **labeled** data.
- **Unsupervised machine learning:** A machine learning algorithm trained on **unlabeled** data.

An Abbreviated History of genAI

A rough timeline:

- 1956: Field of AI research begins at workshop at Dartmouth College.
- 1960s-1980s: Machine learning using neural networks is explored.
- Late 2000s: Development of deep learning. Deep refers to multiple hidden layers in the network.
- 2014: Generative Adversarial Networks (GANs) are developed.
- 2018: OpenAI invents the Generative Pre-trained Transformer (GPT) architecture.
- 2022: ChatGPT released to the public in November based on GPT-3.5.

A simple neural network
input layer hidden layer output layer



Discriminative AI vs. Generative AI

Discriminative models focus on classification and prediction based on given data.

- **Facial recognition:** Identify persons in photo library.
- **Speech recognition:** Siri or Alexa.
- **Medical diagnosis:** Classifying your MRI or X-ray images.
- **Autonomous navigation:** Tesla full self driving.
- **Recommendation systems:** Amazon predicting what you might want to buy.

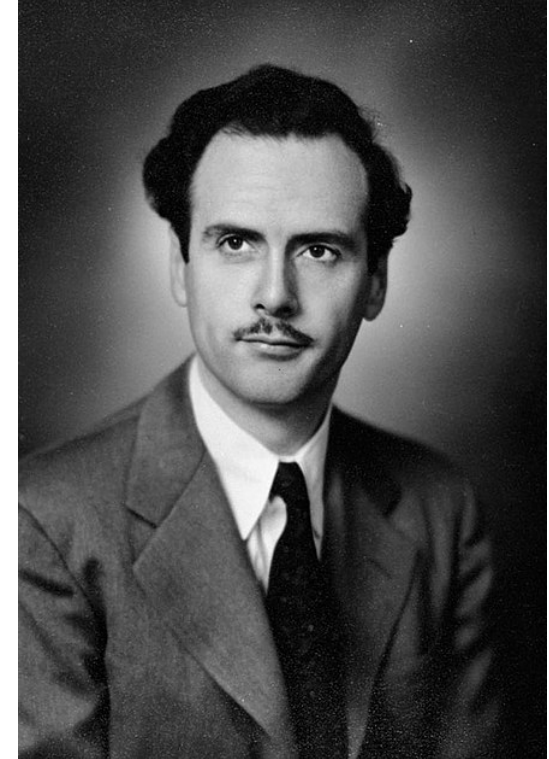
Generative models are capable of creating outputs drawn from the distribution of input data they were trained on.

- **Text generation:** LLMs which generate text from a prompt.
- **Image generation:** Midjourney or DALL-E to generate new images.
- **Drug discovery:** Alpha Fold for predicting protein structure.

The medium is the message

A technology becomes a medium as it employs a particular symbolic code, as it finds its place in a particular social setting, as it insinuates itself into economic and political contexts. A technology, in other words, is merely a machine. A medium is the social and intellectual environment a machine creates.

Understanding Media (1994)



Marshall McLuhan

Neil Postman on the message in the medium

A news show, to put it plainly, is a format for entertainment, not for education, reflection or catharsis. And we must not judge too harshly those who have framed it in this way. They are not assembling the news to be read, or broadcasting it to be heard. They are televising the news to be seen. They must follow where their medium leads. There is no conspiracy here, no lack of intelligence, only a straightforward recognition that “good television” has little to do with what is “good” about exposition or other forms of verbal communication but everything to do with what the pictorial images look like.



Neil Postman

Amusing Ourselves to Death (2005)

Whose interest?

[Y]ears from now..it will be noticed that the massive collection and speed-of-light retrieval of data have been of great value to large-scale organizations but have solved very little of importance to most people and have created at least as many problems for them as they may have solved.

Amusing Ourselves to Death (2005)

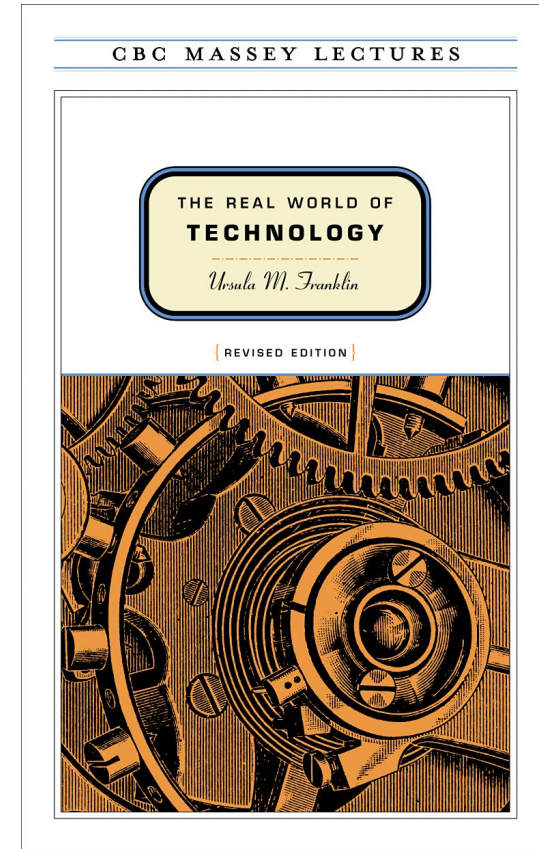


Neil Postman

What is technology?

Recently, people have become particularly interested in technology's social impact. I myself am overawed by the way in which **technology has acted to reorder and restructure social relations**, not only affecting the relations between social groups, but also the relations between nations and individuals, and between all of us and our environment. **To a new generation, many of these changed relationships appear so normal, so inevitable, that they are taken as given and are not questioned.**

The Real World of Technology (1989)



Ursula Franklin's 1989 CBC Lectures

Workshop Goals

Goals for today

By the conclusion of this workshop you will have...

- **Reflected on your values** as an educator and how they are expressed in your classes.
- **Developed a curiosity to experiment** with generative artificial intelligence.
- **Outlined text for your syllabus** to articulate your pedagogical values and examples of how those values work themselves out in your courses.
- **Developed an AI policy** for your courses.

HMC Engineering Department Goals

- **Exceptionally Competent Graduates:** Produce graduates who are exceptionally competent engineers whose work is notable for its breadth and its technical excellence.
- **Hands-On Curriculum:** Provide a “hands-on” approach to engineering so that graduates develop an understanding of engineering judgment and practice, including ethics.
- **Foster Life-long Learning:** Prepare and motivate students for lifetime of independent, reflective learning.
- **Societal Impact:** Produce graduates who are aware of the impact of their work on the world.
- **Reasonable Curriculum:** Offer a curriculum that is current, exciting and challenging for both students and faculty, but can be completed in four years by any motivated student who is admitted to Harvey Mudd College.

HMC Engineering Core Values

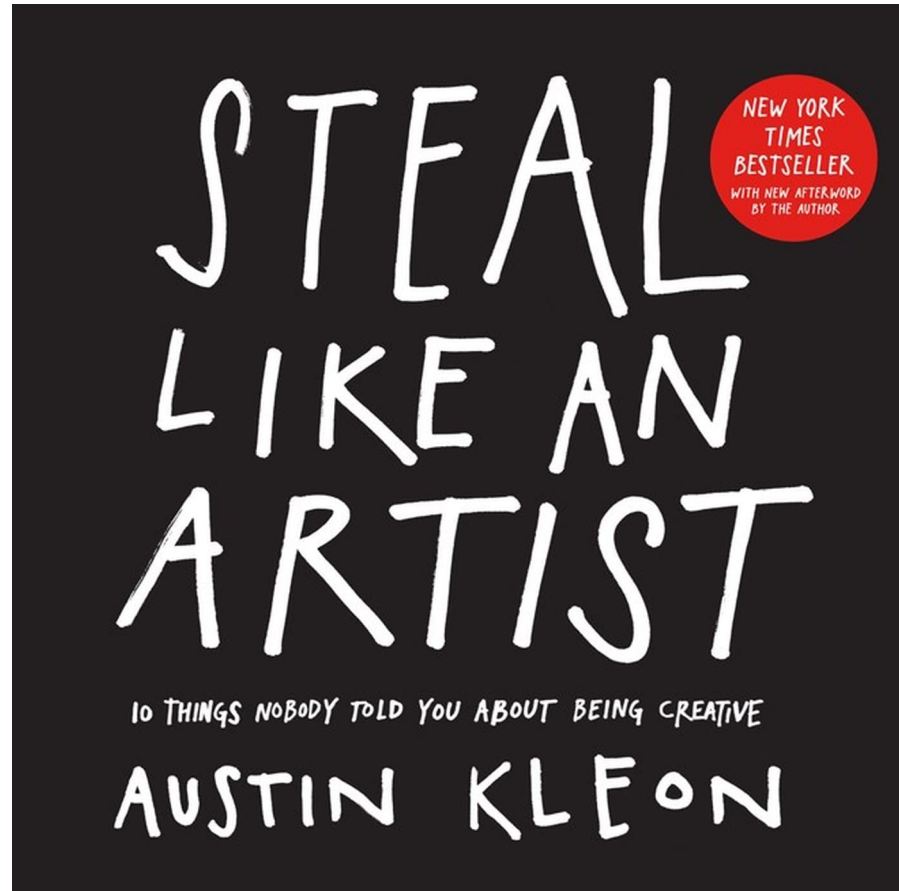
1. We focus on our students. We care deeply about their education, their well-being, and their growth, and we build lasting relationships with them.
2. We mentor and include our students in strong, healthy, curious teams to create positive impact on the world.
3. We listen and learn, seeking to understand each other and the world more deeply. We foster inclusion and belonging.
4. We embrace a prototyping mindset: we believe that progress emerges through trying and failing.
5. We have high expectations - including technical excellence, leadership, and integrity - and we provide a high level of support.
6. We believe combining hard work with joy and play enhances our creativity, productivity and well-being.

HMC Engineering Values Condensed

1. Student Focus
2. Teamwork
3. Societal Impact
4. Empathy
5. Belonging & Inclusion
6. Prototyping Mindset
7. High Expectations
8. Joy
9. Play

Josh's (Unofficial) Engineering Program Goals

Great Artists Steal



Department of Mathematics Goals

Home / Academics / Mathematics / About the Department / Department Goals

Mathematics Menu



Mathematical Practice

P1. (Affection)
Students should appreciate the beauty, fun, and power of mathematics, and be able to articulate what mathematics is about and what mathematicians do.

P2. (Application)
Students should be able to link applications and theory, and be able to apply mathematics in a variety of settings.

P3. (Inquiry)
Students should develop mathematical independence and experience open-ended inquiry, so they have the competence and confidence to build on their knowledge

HMC Engineering Practice Goals

1. **Affection:** Mudd engineers should appreciate the beauty, fun, and power of engineering and be able to articulate what this looks like in practice.
2. **Application:** Mudd engineers should be able to link theory to application and apply concepts in a variety of settings.
3. **Curiosity:** Mudd engineers should develop a deep sense of curiosity about the world and experience open-ended inquiry.
4. **Communication:** Mudd engineers should develop effective thinking and communication skills.
5. **Technology:** Mudd engineers should be able to use technological tools appropriately and effectively.
6. **Society:** Mudd engineers should strive to be good citizens who understand the impact of their work on society.
7. **Teamwork & Leadership:** Mudd engineers should be able to function well as part of a team and demonstrate leadership skills.
8. **Diversity:** Mudd engineers should be able to work and communicate with diverse groups of people across a wide range of different backgrounds and identities.

HMC Engineering Content Goals

1. **Breadth:** Mudd engineers should be competent across a broad range of engineering skills and topics.
2. **Perspective:** Mudd engineers should demonstrate that they can see engineering topics from a variety of perspectives.
3. **Conceptual Unity:** Mudd engineers should see the connection between topics across the various field of engineering.
4. **Experimentation:** Mudd engineers should be able to design, build, execute, and analyze engineering experiments.
5. **Tools:** Mudd engineers should be able to apply concepts and methods from design, computing, modeling, and experimental engineering.
6. **Depth:** Mudd engineers should see at least one engineering topic in depth.
7. **Projects:** Mudd engineers should work in teams on a substantial engineering project that involves techniques and concepts beyond the typical content of a single course.
8. **Careers:** Mudd engineers should be aware of the wide range of careers for engineers.

Agenda for Today

Activities

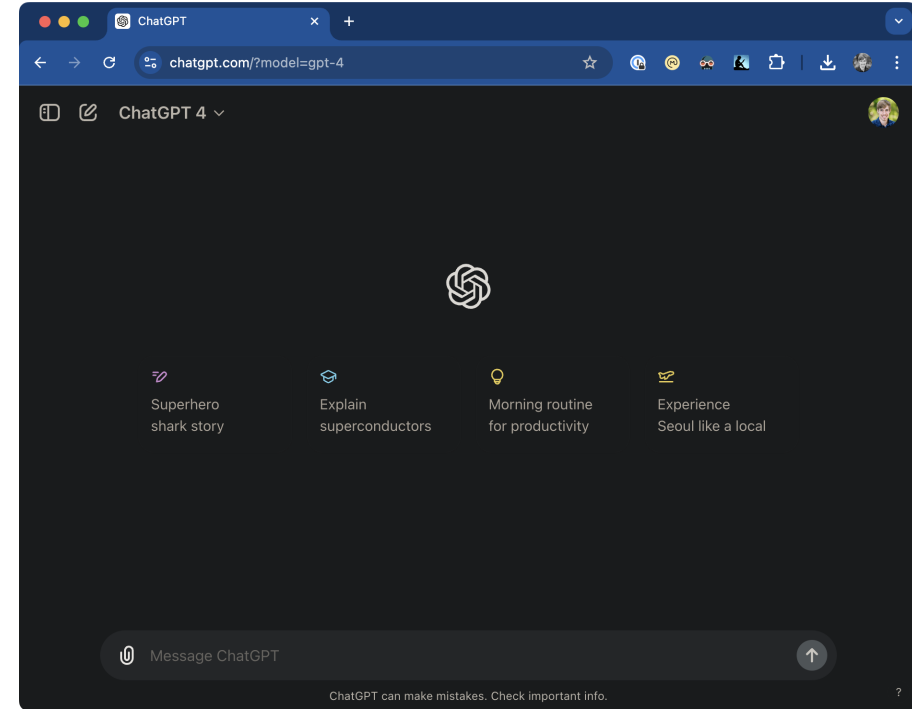
1. [GenAI Demo](#)
2. [GenAI Value Mapping](#)
3. [Syllabus Revision](#)

GenAI Demo

Lookee what he can do!



Yukon Cornelius and the Abominable Snow Monster



ChatGPT

ChatGPT Takes E155

Now it's your turn to take the wheel and create your own design and dust off your digital design chops! Your goal is to write some Verilog modules to further test the hardware on your board and operate a 7-segment display. The system should have the following inputs and outputs:

Signal Name	Signal Type	Description
clk	input	48 MHz clock on FPGA
s[3:0]	input	the four DIP switches (on the board, SW6)
led[2:0]	output	3 LEDs (you may use the on-board LEDs)
seg[6:0]	output	the segments of a common-anode 7-segment display

Write the SystemVerilog to meet this design spec. Write well commented code and make sure to use SystemVerilog syntax (e.g., logic instead of wire/reg). Put this in a module. Be concise.

ChatGPT Takes E155



Here's a SystemVerilog module based on the provided design specification. This module handles the inputs and outputs, driving a 7-segment display based on the state of four DIP switches, and also controls three LEDs.

```
systemverilog Copy

module design_example (
    input logic clk,           // 48 MHz clock on FPGA
    input logic [3:0] s,       // Four DIP switches (on the board, SW6)
    output logic [2:0] led,     // 3 LEDs (on-board LEDs)
    output logic [6:0] seg     // Segments of a common-anode 7-segment display
);

    // Internal signals
    logic [6:0] seg_pattern;    // Pattern to drive the 7-segment display

    // Map the switch input to the corresponding 7-segment display pattern
    always_comb begin
        case (s)
            4'b0000: seg_pattern = 7'b0111111; // '0'
            4'b0001: seg_pattern = 7'b0000110; // '1'
            4'b0010: seg_pattern = 7'b1011011; // '2'
            4'b0011: seg_pattern = 7'b1001111; // '3'
            4'b0100: seg_pattern = 7'b1100110; // '4'
            4'b0101: seg_pattern = 7'b1101101; // '5'
            4'b0110: seg_pattern = 7'b1111101; // '6'
            4'b0111: seg_pattern = 7'b0000111; // '7'
            4'b1000: seg_pattern = 7'b1111111; // '8'
            4'b1001: seg_pattern = 7'b1101111; // '9'
            4'b1010: seg_pattern = 7'b1110111; // 'A'
            4'b1011: seg_pattern = 7'b1111100; // 'b'
            4'b1100: seg_pattern = 7'b0111001; // 'C'
            4'b1101: seg_pattern = 7'b1011110; // 'd'
            4'b1110: seg_pattern = 7'b1111001; // 'E'
            4'b1111: seg_pattern = 7'b1110001; // 'F'
            default: seg_pattern = 7'b0000000; // Display off
        endcase
    end

    // Assign the segment pattern to the output
    assign seg = seg_pattern;

    // Simple LED control logic: LEDs reflect the state of the least significant 3 bits of the DIP
    always_ff @(posedge clk) begin
        led <= s[2:0];
    end
endmodule
```

ChatGPT Takes E155

Explanation:

- `c1k`: The 48 MHz clock input, used to update the state of the LEDs.
- `s[3:0]`: The 4-bit input representing the state of the DIP switches.
- `led[2:0]`: The output to drive three LEDs, reflecting the state of the lower three bits of the DIP switches.
- `seg[6:0]`: The output for driving a common-anode 7-segment display.

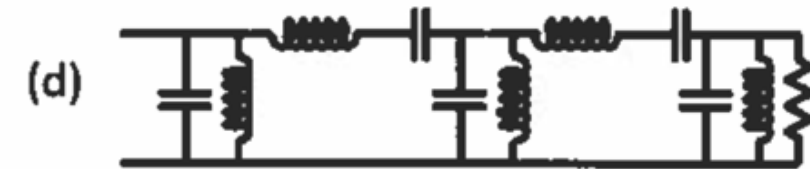
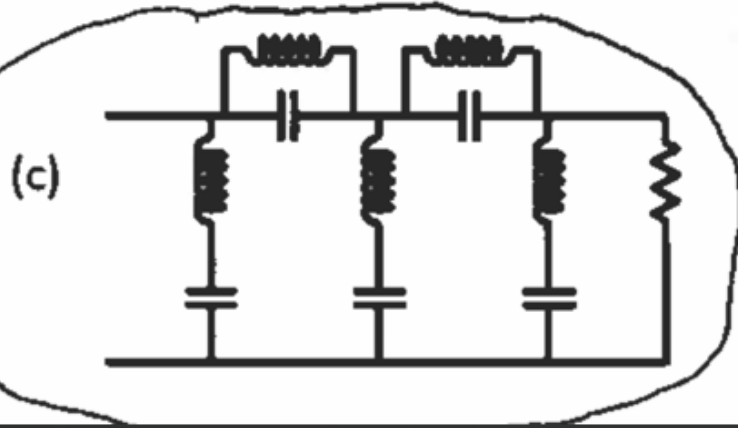
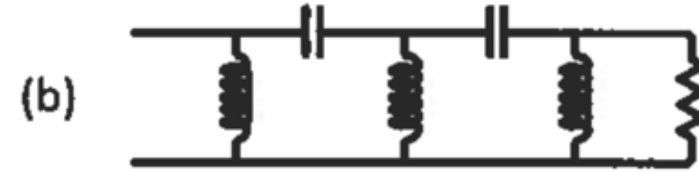
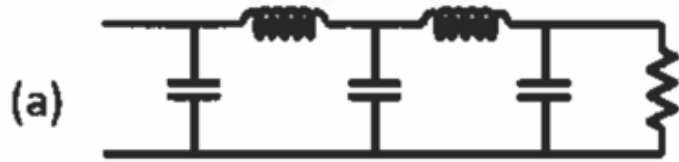
The `seg_pattern` is generated using a case statement that maps the 4-bit switch input to the appropriate pattern for displaying hexadecimal digits (0-F) on the 7-segment display.

The LEDs are updated on the rising edge of the clock, simply reflecting the three least significant bits of the DIP switches.

This module meets the requirements by providing the necessary logic to interface with both the 7-segment display and the LEDs based on the state of the switches.

ChatGPT Takes E157

Which of the following is a band stop filter?



[Solve this question](#)

ChatGPT Takes E157



The correct answer is **option (c)**.

Explanation:

- A band stop filter, also known as a notch filter or band reject filter, is designed to block or attenuate a specific range of frequencies while allowing frequencies outside this range to pass.
- In option (c), the configuration of inductors and capacitors is such that they create a resonance at a specific frequency band, leading to attenuation of that band while allowing other frequencies to pass. This is the typical setup for a band stop filter.

The other options represent different types of filters:

- Option (a) represents a low-pass filter.
- Option (b) represents a high-pass filter.
- Option (d) represents another configuration of a low-pass or high-pass filter, depending on the values and arrangement of the components.

ChatGPT Takes E157 Pt. 2

If a filter table specifies a normalized inductance of 2, what inductance should you use for a filter matched to 50 ohms with a bandwidth of 1Grad/s

Solve this one

ChatGPT Takes E157 Pt. 2



To solve this problem, we can use the relationship between normalized inductance, actual inductance, and the impedance and bandwidth of the filter. The formula for the actual inductance L is:

$$L = L_n \times \frac{Z_0}{\omega_c}$$

Where:

- L_n is the normalized inductance (given as 2).
- Z_0 is the characteristic impedance (given as 50 ohms).
- ω_c is the cutoff angular frequency, which is related to the bandwidth.

Given that the bandwidth is 1 Grad/s (which is 10^9 rad/s), we can plug in the values:

$$L = 2 \times \frac{50 \Omega}{10^9 \text{ rad/s}}$$

$$L = \frac{100}{10^9} \text{ Henries}$$

$$L = 100 \times 10^{-9} \text{ Henries}$$

$$L = 100 \text{ nH}$$

So, the required inductance is **100 nH** (nanohenries).

ChatGPT Takes E4

Help me design and build a new beach toy for kids. The goal is for the toy to be inserted into the ground at the beach so that it can pump water up from the water table below the ground to keep water features in a sandcastle continuously going like a fountain. Help me walk through each step of the design process and make sure that I empathize with the user and define the problem correctly before suggesting any ideas to build and execute.



ChatGPT Takes E4



Memory updated

Step 1: Empathize with the User

To begin, we should deeply understand the user—children playing at the beach—and the environment in which they'll use the toy. Consider the following aspects:

- **User Characteristics:**
 - **Age Range:** The toy should be usable by children, likely between 4-12 years old, who are playing independently or with minimal supervision.
 - **Physical Capabilities:** The toy should be easy to operate, requiring minimal strength and coordination.
 - **Interests:** Children are often fascinated by water play, building sandcastles, and seeing the direct impact of their actions (e.g., water flowing through a castle).
- **Context of Use:**
 - **Environment:** The beach, with loose sand, varying water table depths, and a need for durable materials that can withstand exposure to saltwater and sunlight.
 - **Goals:** The toy should enhance the sandcastle-building experience, allowing children to create more dynamic structures with flowing water.
- **Pain Points:**
 - **Manual Effort:** Pumping water can be tiring or difficult for children.
 - **Complexity:** A toy that is too complex may frustrate children or require too much adult assistance.
 - **Portability:** The toy needs to be easy to carry, lightweight, and not take up much space.

ChatGPT Takes E4

Step 2: Define the Problem

With the user in mind, let's clearly define the problem:

- **Problem Statement:**
 - "Children at the beach want to enhance their sandcastle-building experience by incorporating flowing water features. Current methods of bringing water to their sandcastles are either manual and labor-intensive or do not allow for continuous water flow, leading to frustration and limiting creativity."

ChatGPT Takes E4

Step 3: Ideation

Now that we've defined the problem, let's brainstorm potential solutions. We want to generate a variety of ideas that address the user needs and the problem we've defined.

- **Key Features to Consider:**

- **Ease of Use:** The toy should be simple to insert into the sand and operate.
- **Continuous Water Flow:** The design should allow for a continuous flow of water with minimal effort.
- **Safety:** All parts should be safe for children to handle, with no sharp edges or small parts.
- **Durability:** The materials should be able to withstand sand, water, and rough play.

- **Possible Ideas:**

1. **Hand-Pumped Water Toy:** A simple hand-pump mechanism that children can easily operate, drawing water from the ground and channeling it into their sandcastle.
2. **Solar-Powered Water Pump:** A small, solar-powered pump that provides a continuous flow of water when exposed to sunlight.
3. **Foot-Powered Water Pump:** A design that allows children to pump water by stepping on a pedal or squeezing a bladder with their foot.
4. **Bucket and Siphon System:** A system where water is drawn up into a container, and gravity allows it to flow out in a controlled manner through channels in the sandcastle.

ChatGPT Takes E4

Step 4: Prototype and Test

Before moving to full-scale production, it's crucial to prototype the most promising ideas:

- **Prototyping:**
 - **Materials:** Use easily accessible materials to create simple prototypes, such as PVC pipes, hand pumps, and basic solar panels.
 - **Testing:** Take the prototypes to a beach environment to test with real users (children). Observe how they interact with the toy, what challenges they face, and how much they enjoy the experience.
 - **Feedback:** Gather feedback from both children and parents to refine the design.

ChatGPT Takes E4

Step 5: Iterate and Improve

Based on the feedback, refine the design. This might involve simplifying the operation, improving the durability, or making the toy more portable. The goal is to enhance the user experience and ensure the toy meets the needs of children effectively.

Step 6: Final Design and Production

Once satisfied with the prototype, move to the final design phase:

- **Materials Selection:** Choose durable, child-safe materials that can withstand the beach environment.
- **Manufacturing:** Consider how the toy will be manufactured, keeping in mind cost, safety standards, and ease of assembly.
- **Marketing:** Think about how to market the toy—emphasizing its ease of use, fun factor, and ability to make sandcastles even more exciting.

Would you like to explore specific ideas further or move on to prototyping?

ChatGPT Takes E4 Pt. 2

Give me 50 different ideas for how I could build the system to bring the water up out of the ground. Do not constrain the answer to practical or functional ideas. They need not be physically possible.

ChatGPT Takes E4 Pt. 2



Certainly! Here are 50 creative and imaginative ideas for how you could bring water up out of the ground at the beach:

1. **Magic Wand:** A child waves a wand over the ground, and water magically flows up like a fountain.
2. **Gravity-Defying Water:** A special device reverses gravity in a small area, pulling water up instead of down.
3. **Sand Vortex:** Spinning a small device in the sand creates a vortex that draws water up to the surface.
4. **Singing Shell:** A seashell that, when sung into, draws water up from the ground.
5. **Animal Helper:** A robotic crab or seagull digs into the sand and pumps water up with its movements.
6. **Wishing Well:** A small well that grants wishes when coins are tossed in, and water flows up as a result.
7. **Magnetic Water:** A device that uses magnetism to attract water molecules and pull them to the surface.
8. **Echo Chamber:** A tube that, when a child shouts into it, causes water to rise from the ground in response.
9. **Plant Pump:** A plant-like structure with roots that suck water up from underground and channel it to the surface.
10. **Rainbow Straw:** A long straw that children blow into, causing a rainbow effect and water to rise up through the straw.
11. **Cloud Catcher:** A device that captures moisture from the air and condenses it, causing it to rain into the sandcastle.
12. **Sunbeam Collector:** A solar-powered device that heats the ground, creating steam that condenses into water above.
13. **Dancing Sand:** A mat that vibrates when danced on, causing water to be drawn up through the sand.
14. **Moonlight Pump:** A device that only works at night, using the power of moonlight to draw water from the ground.
15. **Infinite Straw:** A straw that extends infinitely down into the earth, always finding water no matter where it is.
16. **Dragon's Breath:** A small dragon figurine that "breathes" hot air into the sand, drawing water up like steam.
17. **Echoes of the Ocean:** A conch shell that, when held to the ear, causes the sound of the ocean to pull water up.
18. **Time-Travel Spade:** A spade that digs into the past, retrieving water from when the beach was an ocean.
19. **Water-Summoning Amulet:** A magical amulet that, when placed on the sand, summons water to the surface.
20. **Dreamcatcher Net:** A net that catches dreams at night, and when shaken, the dreams become water.
21. **Geyser-In-A-Box:** A small box that, when opened, releases a controlled geyser of water.
22. **Invisible Pump:** A pump that operates invisibly, with no apparent source of power, but draws water nonetheless.
23. **Soundwave Diverter:** A device that converts sound waves into pressure, forcing water up from below.
24. **Kite-Powered Pump:** A kite that, when flown, generates power to pump water from the ground.
25. **Windmill Fountain:** A tiny windmill that uses wind power to draw water up and create a small fountain.

ChatGPT Takes E4 Pt. 2

26. **Footstep Activator:** A pad that, when stepped on, activates a pump beneath the surface, drawing water up.
27. **Sand Compass:** A compass that, when pointed in a certain direction, causes water to flow towards that point.
28. **Gravity Harness:** A harness that a child wears, using their own gravitational force to pull water up.
29. **Musical Pipes:** A set of pipes that, when played like a flute, draw water up from underground.
30. **Echoing Stomps:** A platform that amplifies the sound of stomping, causing water to resonate and rise.
31. **Whispering Sands:** A sand dune that, when whispered to, responds by drawing water up through the grains.
32. **Sunken Ship Pump:** A model ship that "sails" below the sand, bringing water up like a shipwrecked treasure.
33. **Color-Changing Sand:** Sand that changes color to signal where water is, and a scoop that draws it up.
34. **Crab Claw Dig:** A crab claw toy that digs deep into the sand and pumps water up as it burrows.
35. **Solar Balloon:** A balloon that inflates with sunlight and creates suction, pulling water up through a tube.
36. **Seashell Echo Pump:** A set of connected seashells that, when blown into, create a suction effect drawing water up.
37. **Infinite Fountain Pen:** A pen that, when drawn in the sand, leaves a trail of water instead of ink.
38. **Rainbow Siphon:** A siphon that uses the power of rainbows to draw water up in colorful streams.
39. **Mirror Reflection Pump:** A mirror that reflects sunlight in a way that creates pressure to pull water up.
40. **Gravity Well:** A localized gravity well that pulls water up to the surface in a controlled stream.
41. **Thunderstorm Straw:** A straw that "charges" with energy during a thunderstorm, then draws water up when used.
42. **Miniature Tornado:** A device that creates a small tornado in the sand, drawing water up as it spins.
43. **Magnetized Pebbles:** Pebbles that, when arranged in a certain pattern, create a magnetic field that pulls water up.
44. **Wishing Pebble:** A pebble that, when placed on the sand, grants a wish for water, causing it to rise up.
45. **Hydraulic Sand Sculptor:** A tool that shapes the sand into channels while simultaneously drawing water up.
46. **Pulse Beat Pump:** A pump that operates in sync with the pulse of the user, drawing water up rhythmically.
47. **Solar-Powered Shrubs:** Shrub-like structures that soak up sunlight and draw water up through their "roots."
48. **Echoes of the Deep:** A device that simulates the sound of deep-sea creatures, causing water to rise in response.
49. **Floating Buoy Pump:** A buoy that floats just below the surface, drawing water up as it moves with the waves.
50. **Light Beam Extractor:** A device that focuses light into a beam that "drills" into the sand, pulling water up as it goes.

These ideas range from the wildly fantastical to the slightly more plausible, encouraging out-of-the-box thinking for your project!

High-level Observations

- LLM-generated text can reproduce the type of structure and format of problem solving we would like to see.
- Clean syntax is no longer a worthy proxy for clear thought.
- The types of errors in LLM-generated text are tricky to detect.
- The LLMs “solves” the blank page problem.
- Generating *a* solution is now effectively free.
- The floor for communicating in writing has been raised.

Activity #1: GenAI Value Mapping

Exploring alignment

GenAI Value Mapping Exercise

For each of the following values, rank how significantly you anticipate generative AI will impact it (the inner product, if you'll humor me). Then jot down a few notes on how you expect generative AI to have either a positive or negative impact.

Value	genAI · Value	Comments
P1: Affection	-2 -1 0 1 2	
P2: Application	-2 -1 0 1 2	
P3: Curiosity	-2 -1 0 1 2	
P4: Communication	-2 -1 0 1 2	
P5: Technology	-2 -1 0 1 2	

Course intersections

Instructions: For your course, fill out the table below. List the elements of your course in the rows of column A at whatever level of specificity best suits your course. For example, you could focus on high-level elements (e.g., homeworks, exams, projects) or focus at a more granular level with specific lectures, assignments, or exams.

Once you've listed out the course elements, put an "x" in the columns that correspond to the relevant values that the element addresses (e.g., group projects might naturally address the values of application, communication, teamwork, and tools).

[illegible]

Experimenting with AI in your courses

Some Principles

1. Build trust
2. Build agency
3. Encourage reflection
4. Explain what learning looks like
5. Make values and learning goals explicit
6. Find ways to show your students you trust them
7. Build socio-technical thinking

Prototypes

For Students

1. Homework Helper
2. Interactive Encyclopedia
3. Ideation Partner

For Instructors

1. Pedagogy Coach
2. Active Learning Activity Generation
3. Feedback Summarization

Activity #2: Syllabus Revision

Elements of a Syllabus Policy

1. A brief explanation of what generative AI is (here's a nice [interactive demo](#) of transformers from the Financial Times)
2. Your policy on generative AI use in the classroom
 - Avoid
 - Embrace
 - Critical Exploration
3. An explanation of the reasoning behind your policy
4. An articulation of your expectations around use if you are allowing genAI to be used (e.g., norms around disclosure, reporting requirements, etc.)

Resources

<https://bit.ly/AI-Syllabi>

Syllabi Policies for Generative AI ☆ 📄 ☁						
File Edit View Insert Format Data Tools Extensions Help						
🔍 Menus 🖨️ 📄 100% 👁 View only						
A1	Course					
	A	B	C	D	E	F
1	Course	Discipline	Policy in the Syllabus	Contributor	Rights for Reuse	Institution
2	ACM271 - Intro to Arts & Cultural Management	Arts	Use of generative AI in class and for assignments You are welcome to use generative AI tools (e.g. ChatGPT, Dall-e, etc.) in this class as doing so aligns with the course objectives of Creating Mission and Vision Statements, Creating a Sample Budget, and Creating Plans for your own Performing Arts Organization or Museum. You may not use generative AI for the remaining assignments. You are responsible for the information you submit.	Max Evjen Twitter: @cantus94 Bluesky: @cantus94.bsky.social		Michigan State University
3	CD115 Design Studio 1	Arts	Submit your own work. If you use a source for support, include quotes and a citation. Academic dishonesty includes taking content from an Internet search, another person/entity, or AI technology such as ChatGPT (either directly or with modification) and representing it as your answer.	Susan Leopold		Fashion Institute of Technology
4	Digital Design Studio	Arts	Use of AI such as Chat GPT: This is somewhat new territory at academic institutions and policies are being developed to address the potential negative impact of AI, which might lead to acts of plagiarism as well as diminish learning overall. In this course all your work must be your own, including the small bits of writing that are part of the course project criteria. In an ideal world, Chat GPT can be/become an excellent	Maura Jurgrau		Fashion Institute of Technology
5	BIOSC_3750 General Microbiology	Biology	Ethical Use of Generative AI in this Course Generative AI (GAI) tools, such as ChatGPT, Google Gemini, DALL-E 2, and others, are transforming various aspects of society, including academic and scientific fields. In this course, you may utilize GAI as an editor, translator, idea generator, data visualization tool, or tutor. GAI can be a powerful learning tool.	Caroline Grunenwald	Contact me for specific permissions	University of Missouri
6	Business	Business	I expect you to use AI (ChatGPT and image generation tools, at a minimum), in this class. In fact, some assignments will require it. Learning to use AI is an emerging skill, and I provide tutorials in Canvas about how to use them. I am happy to meet and help with these tools during office hours or after class. Be aware of the limits of ChatGPT.	Ethan Mollick		Wharton School University of Pennsylvania

Closing Thoughts

Some things you should discuss with students

- When to use an LLM vs. talk to your classmate or instructor
- The environmental considerations: the computational horsepower to run these things takes a lot of electricity and water.
- Data privacy concerns: The ethical issues surrounding training data
- Embedded biases

Contact Me

You know where to find me!



Substack: joshbrake.substack.com

Email: jbrake@hmc.edu

Twitter: [@JoshuaBrake](https://twitter.com/JoshuaBrake)

Bluesky: [@joshbrake.com](https://bsky.app/profile/joshbrake.com)



The Absent-Minded Professor

Technology, education, and human flourishing.
All through the lens of a prototyping mindset.

By Josh Brake · Over 2,000 subscribers

Subscribe

Check it out first >

"Brake's insights on teaching, technology, and the flourishing life always make me look deeper and think well about these themes in my own life."

Megan J. Robinson, [Megan J. Robinson](#)

"Awesome thoughts on teaching, learning and growth in higher education, through the lens of experimentation and prototyping."

Mary Chris Escobar, [The Healthier Hustle](#)

"Thoughtful essays on the social impacts of technology from someone who builds and teaches technology."

Rob Nelson, [AL Log](#)