

Trevor's Mind Matter

Oberlin College Graduation

To graduate you need to also complete Vector Calculus at UCSD to satisfy the Multivariable Calculus requirement at Oberlin.

Spring Semester 2021

- NSCI400: Neuroscience Seminar
- CHEM103: General Chemistry
- MATH301: Foundations of Analysis
- MATH311: Linear Optimization
- NSCI607H: Research

Summer Semester 2021

- CHEM205: Organic Chemistry
- MATH318: Cryptography
- MATH327: Group Theory
- PSYC210: Complex Cognition
- NSCI607H: Research?
- CSCI995H: Research?

PhD Considerations

These will apply regardless of the time in which you actually decide to apply

- Perform decent work to in order to obtain three *strong* letters of recommendation.
- Consider taking the Math GRE Subject Test in April
- Consider email PhD labs and students to get a sense of the culture at the place

Project Goals

- SteveBot: A tool to classify fossils.
- FossilVerse: A global database of fossils with taxonomic indexes. This is training data for SteveBot.
- Automator: An automatic calendar, web scraper, report producer, and reminder application for my productivity.
- arch2vec-re: Reproduction of the paper arch2vec

Things TODO

- Create the drift diffusion repository: add research diagrams, interactive JavaScript code, and explanations.
- Get computer functioning, with new motherboard
- Complete the ant object detection for Professor Kamhi
- Experiment with the PCA for Professor Simen
- Learn Deep Learning Architectures, Machine Learning Refined, Hands on Machine Learning
- Learn Algebra Chapter 0, Analysis I, Numerical Optimization
- Make an icon for the website

Habits

- Exercising
- Writing: Scientific, creative, journal, etc.. writing
- Reading
- Memorizing

- Doing Math
- Researching: Includes implementations, reproductions, research projects, publishing, note taking, and presentation of concepts.
- Programming

Desires

I need to still adequately differentiate the purpose of Desires, ImagineX, What if?, and Questions.

- Look for a way to track your changing states of mind: calmness + improved ability to speak, stutter + uncoordinated, stressed + in a state of flow, manic + exceptional linguistic ability.
- Look for a way to track and improve the quality and duration of your sleep
- Look into ways to visualize brain waves.
- Research dietary effects on brain wave fluctuations and method of brain wave manipulation.
- A non-pharmaceutical mechanism to increase endogenous attention and concentration without downside.

ImagineX

I need to still adequately differentiate the purpose of Desires, ImagineX, What if?, and Questions.

- Imagine reciting poems you've memorized during intercourse; I think this would be awesome.
- Imagine explaining a phone to a 17th century intellectual.
- Imagine (visualize) a lamp post wrapping around itself.
- Imagine a life without having to defecate or urinate (maybe through bacteria that reabsorb waste into your body).

What if?

I need to still adequately differentiate the purpose of Desires, ImagineX, What if?, and Questions.

- What if people's abilities to speak or form sentences mentally were limited, to where they could only speak 1,000 words each day before having to regain the capacity to form new words.
- What if societies of Neanderthals and Sapiens existed concurrently?
- What if people could scroll through their memories like scrolling through an album of photos on their phone?
- What if people could simply undergo some biological operation (maybe via nanorobotics or stem cells) that commanded the body's hormones to change the proportionality of any appendage, organ, or body part?
- What if something could be downloaded to the brain, like a DMT experience of something learning program from the movie *The Matrix*?

Unfiltered Insights

- Will you care about this in the long run?
- What is the hardest you've ever worked on something?
- Look people in the eyes.
- Stand up and sit up straight.
- Is there any easier way to do this?
- Think before you speak and avoid saying dumb things.
- Remind yourself everyday of what you want to achieve.
- You can't learn everything.
- What should guide what you choose to study? Impact, future opportunities, enjoyment?
- Potentially avoid remaking what's already made.
- Actually think about what you are copying, when you need to.
- Focusing on something right before bed seems to help in doing that thing the following morning.
- Avoiding idleness and low diversity in thought environments.
- Avoid reacting quickly as much as possible.
- Not exercising produces gradually degradations in thinking and motivation.
- Keep close to smart, honest, and ambitious people.

- There seems to be a trend towards things getting more complex. Futuristic inventions and solutions will probably involve many things operating and integrated smoothly. They will probably be very complex and if you are to aid in this development, it would help to have domain knowledge in more than a single discipline.
- Motos: Robust science, rigorous skepticism

Unbranched and Biased Questions / Things Worth Studying

These questions have not themselves been subjected to scrutiny, scrutiny that would reduce their latent bias and would help to branch the question into multiple other questions which are more specific. For example, asking How should human society handle drugs? assumes drugs need to be handled, uses the word "handle" which has a negative connotation and indicates that the drugs in question are probably those that are abused, and ignores that there are many different types of human societies.

- How does temperature affect human behaviour and cognition?
- How does aging work?
- How should human society handle drugs?
- What are the differences between spoken language / written language?
- What would a society without privacy look like?
- If Google, Apple, or Amazon wanted to rule the world, what would they have to do to do it?
- How can machine learning be speed up?
- Is there an alternative to neural networks that performs just as well?
- Can biological substrates be manipulated to outperform neural networks?
- What should the average citizen do to avoid harm done unto them psychologically by corporations?
- How can human intelligence be improved?
- How much can be learned about someone from their handwriting?
- How can humans best live on Earth?
- How can societies increase interest in the scientific process?
- What considerations must be had for a NN to be able to work for any type of data?
- Quantifying what people value?
- How what is the co-future of technology and politics?
- How can consistent energy levels be increased in humans?
- Can innovation be automated?
- What is attention and how can it be improved?
- What is collective memory and how can we strengthen it to prevent tragedies from repeating?
- What are some epigenetic changes induced by internet use? Has the internet irreversibly altered humanity in some way?
- What is the best way to go about understanding how brain work at different levels of complexity?
- When would censorship be a good thing? A bad thing?
- What are the neural correlates of respect?
- What is the smallest thing?
- What is creativity and how can it be increased?
- Are there other intelligent civilizations?
- What components underlie the stability of society?
- How can humans prevent habitat loss?
- Could people subsist off of only lab grown food and still be healthy?
- How can a person become more intelligent?
- What is the maximum possible human healthspan?
- How can humans survive or prevent astronomical or geological catastrophes?
- What doth life? jk, What is life in terms of information and how can it be synthesized?
- What are the general conditions for life in the universe?
- What is the smallest robot that can be constructed?
- Is there a more optimal way to achieve the same outcome as a neural network?
- What is consciousness? How can it be leveled out -> does it come in degrees?
- Can fresh water be synthesized at scale from hydrogen and oxygen?
- What are the neural correlates of personality?

- Can organismal experiences be quantified meaningfully?
- What is the best way to learn something? If this is unique to each person, how can this best way be discovered?
- Can life be represented mathematically in such a way that each life form can be indexed and all possible forms of life are known?
- Is DNA or RNA necessary for life?
- What is information?
- What are the general principles governing human structures (tribe, society, civilization, state, etc..)?
- What is the minimum amount of energy that can be used for all of humanity to live comfortably?
- Is there enough energy for widespread geoengineering?
- What would likely happened if an asteroid were forecasted to hit Earth in 1, 10, 100, 1000 years?
- What are the limits of data compression?
- Could the Earth's magnetism be harvested locally and used for antigravity vehicles?
- Can volcanoes be prevented from erupting?
- Why is cloning your brain not a reality?
- When will the precious ores of the Earth be depleted?
- Look into whether or not induced gamma waves are a signal of concentration or induce concentration themselves.
- How can human energy levels be sustainably increased?
- Is there a form of light (maybe luminescence) that doesn't emit light pollution and can be scaled?
- What are the parameters that affect neuroplasticity?
- Why would someone want to have heightened neuroplasticity?
- Can the rate of human learning be enhanced noninvasively?
- What limits the rate of information processing and retention in the brain?
- How can the rate of information processing in the brain be enhanced?
- If the "learning", "comprehension", and "memory" limiting factors be over-written, would there be any drawbacks?
- How does brain wave activity correspond to endogenous attention?
- How can BDNF production be promoted without adverse consequences?
- Are there proteins or chemicals that accrue following sustained concentration that prevent further concentration from occurring? How can this be ameliorated?
- How can neuroticism be hampered or lessened?
- What are processes that reduce anxiety or improve coping mechanisms with anxiety?
- Are there paradigms for changing human habits (like algorithms that guarantee continued change)?
- Are there paradigms for reimagination of some concept perceived as difficult to a perception of triviality so as to increase how often someone approaches what they need to get done?
- What occurs in the brain during concentration or endogenous attention?
- What are the effects of the gut microbiome on intelligence?
- Is there a way to produce and sustain in a human the gut microbiome that provides them with their optimal choice of thoughts, urges, effects of the microbiome, etc..?

Things to Explain in Detail

- MLPs
- CNNs
- VAEs
- NAS
- YOLOv3 with custom images

Essay Topics

This includes creative writing topics

- ☒ Write about two people seeing each other for the first time.
- ☒ How do you feel when you love someone who does not love you back?
- ☐ How much should people care about the prosperity of the entire human race?

- ☐ Write about the thoughts swirling in the mind of the first human to create fire.

Favorite Quotes

- Imagine a flashy spaceship lands in your backyard. The door opens and you are invited to investigate everything to see what you can learn. The technology is clearly millions of years beyond what we can make.
This is biology

Project Ideas

Make things that people will love using and that look beautiful

- GANs for optical illusions
- Raspberry Pi alarm and reminder controlled by Automator
- Using RL to understand evolutionary behaviour and complexity in living systems
- Some sort of randomly generated and diverse JavaScript puzzles

Potential Skills to Learn

- AWS
- C++
- Docker
- Flask
- JavaScript
- Three.js
- CUDA
- Creation of a website

Reading List

There are books that could be here but are in todo, as they involve exercises.

- X-Risk
- The Satanic Verses
- Against the Grain
- The Great Silence