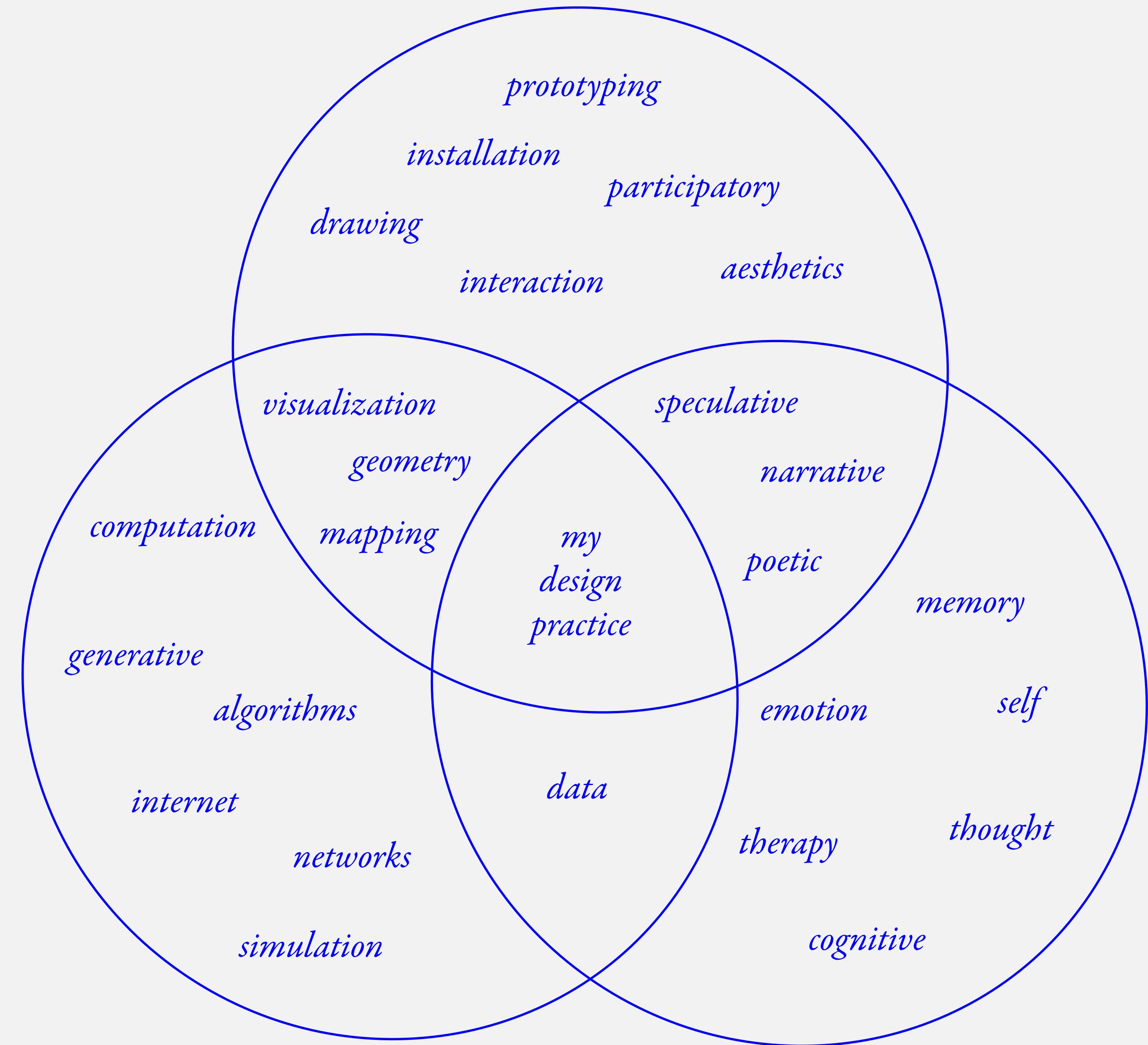


lex

@lex.csv on insta  
[www.alexaann.net](http://www.alexaann.net)

Alexa Ann Bonomo

Interactive Artist and Designer, Lecturer  
Department of Design @ UC Davis  
Instructor at Index Space  
Student at SFPC

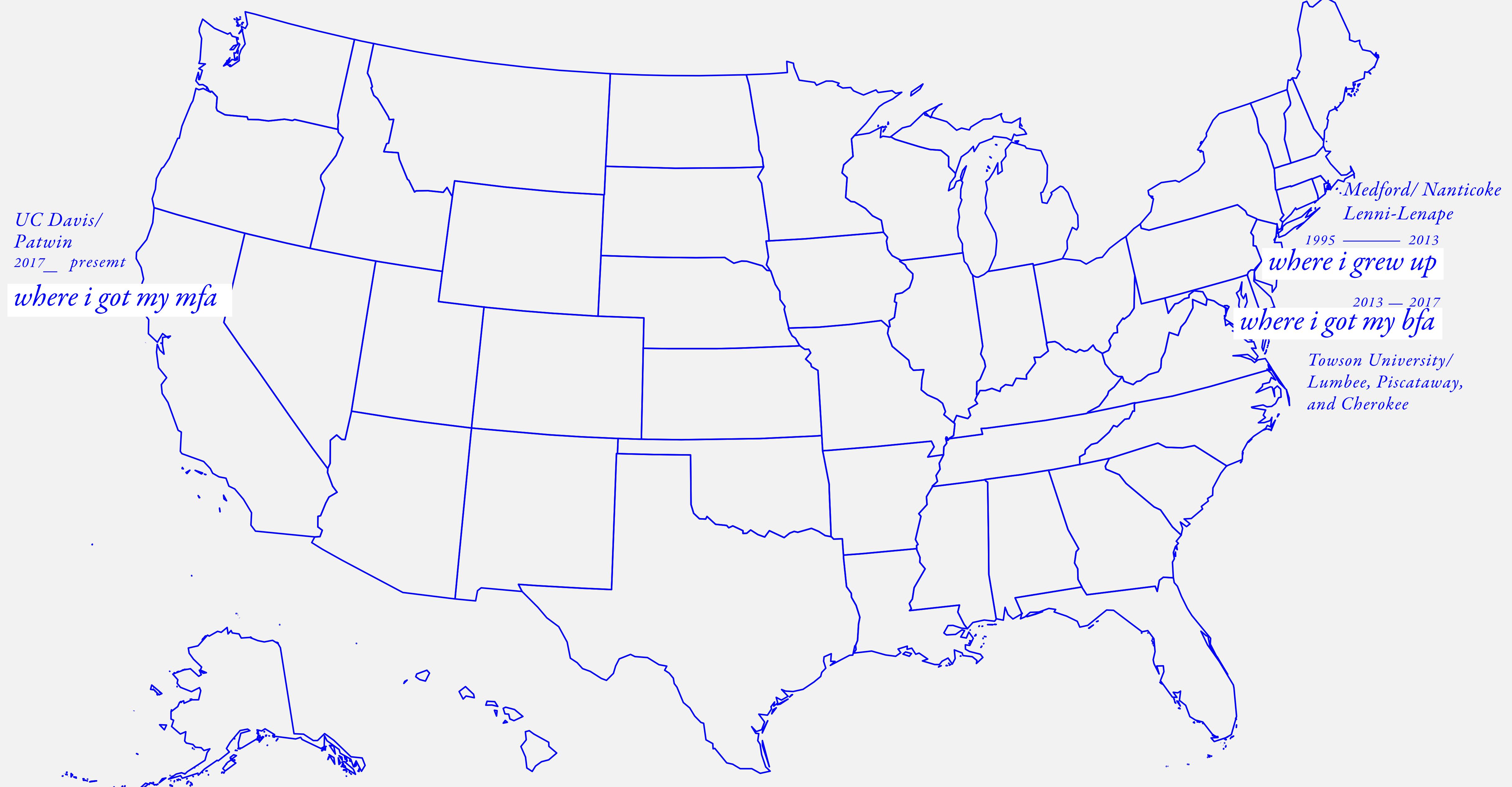


# *What normally goes on in my head ...*

*I ask a lot of the time, “how does  
the information I emit everyday  
feedback visually?”*

*When I think about  
the marks, pixels, and  
computer memory  
I leave behind I  
wonder how much  
substance is left  
unrevealed.*

*Sometimes I  
think about what  
metaphorical being  
can take the form of  
data about myself.*



*During my undergrad ...*

*Experimental processes in digital  
art and design*

*Film making and  
screenwriting*

*Printmaking*

*My first introduction into programming was an idea during my Interactive Media class during my last full semester at Towson in 2016. It was part of the physical computing module where we were learning arduino. My first ever idea that I fixated on was an orb that had LED bulbs that shifted between red and blue to show low to high global temperature throughout the past century. The farthest I got in the project was to get two leds to light up. Then we moved to the next module.*

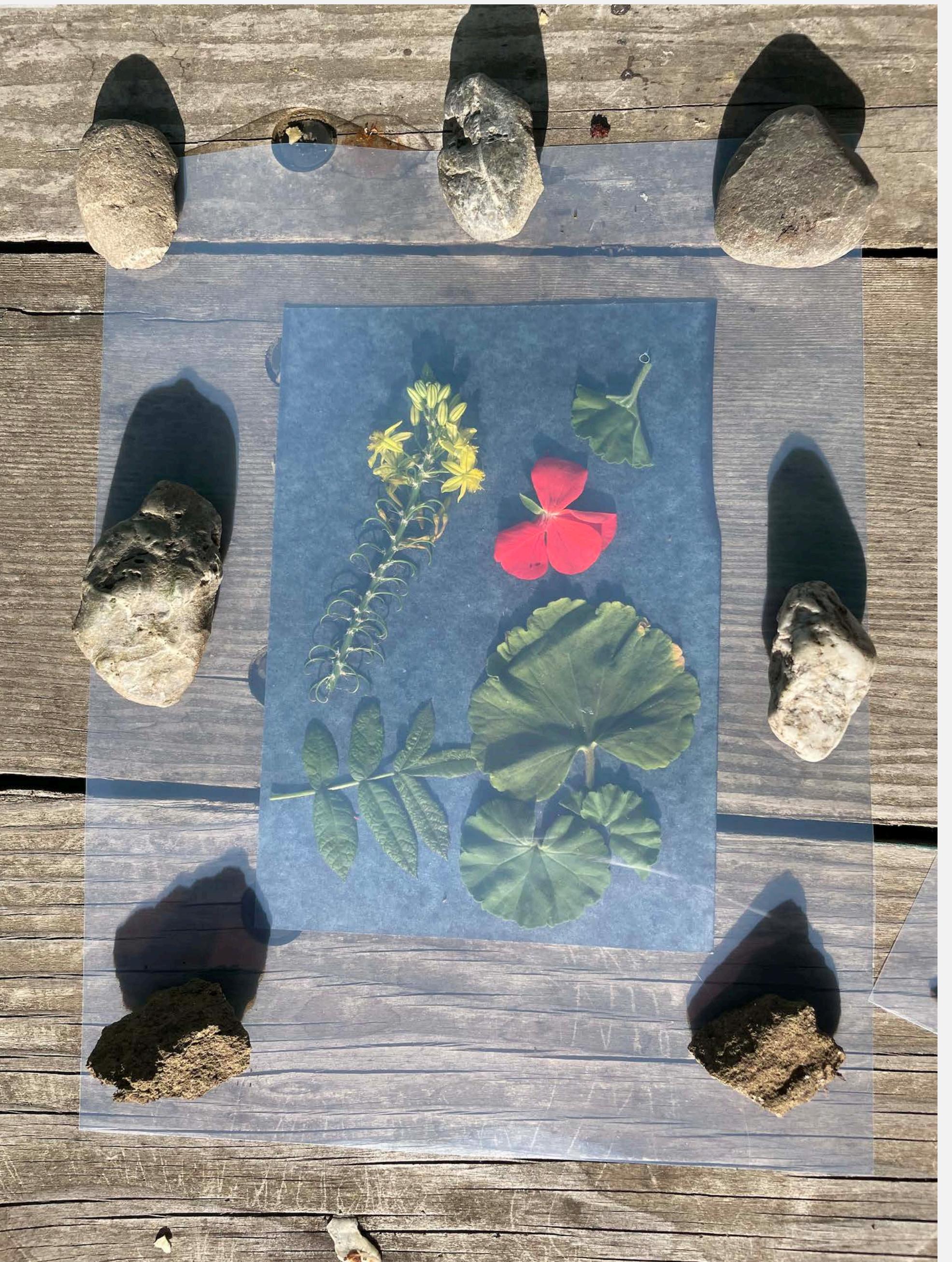
## *A love letter to a speculative liberatory learning environment*

A space that is a portal. Portals give way to growth and perspective shifts. Shifting views, morals, and connections. A shifting box that can adhere to the groups needs that day. As time goes on, artifacts collect in the space that hold meaning to the people within. The space becomes customized to the group who inhabits it.

I Imagine a collective environment where teaching is traded amongst members. Ongoing conversations and exchange of knowledge. Sharing progress on individual projects, experiments, inventions. Writing and passing notes to each other to share thoughts and feelings.

The environment adapts to the group's emotions and physical being. Maybe what you put forth manifests into a state of "weather climate" either literally or metaphysically. An entity, a deity, a very verbose handwritten letter that shares all its love for you. Provides comfort when it is needed. The portal gives light when there is darkness, and darkness when the light can be too much.

As the group progresses together, more space expands in the portal. Small rooms and nooks, gardens that hold memories and signs of care. Libraries of collected readings. But always in response to the group's actions. The portal is a mirror of everyone else.



```
~/folder-poem/sleep
alexabonomo$ tree -a

.
├── .DS_Store
├── dream
│   └── engulfed-in-a-temporary-world
│       └── where-you-fall-in-a-bed-of-oceans
│           └── let-it-wash-over-you
│               ├── _._~._~._~._~._~._~._~._~._~._~._~._~._~._~.txt
│               ├── be-not-afraid.txt
│               ├── ~._~._~._~._~._~._~._~._~._~._~._~._~._~.txt
│               └── ~._~._~._~._~._~._~._~._~._~._~._~._~._~.txt
├── rest-your-eyes
│   └── feel-your-body
│       └── expand-and-collapse
│           └── sinking-deeper
│               ├── _._~._~._~._~._~._~._~._~._~._~._~._~.txt
│               ├── be_not_afraid.txt
│               ├── ~._~._~._~._~._~._~._~._~._~._~._~._~.txt
│               └── ~._~._~._~._~._~._~._~._~._~._~._~._~.txt
└── restore
    └── your-mind
        └── look-at-my-mind
            └── reflect
                └── you-mirror-my-mind
                    ├── _._~._~._~._~._~._~._~._~._~._~._~.txt
                    ├── be-not-afraid.txt
                    ├── ~._~._~._~._~._~._~._~._~._~._~._~.txt
                    └── ~._~._~._~._~._~._~._~._~._~._~._~.txt

script.py
```

```
13 directories, 14 files
~/folder-poem/sleep
alexabonomo$
```

```
-bash
alexabonomo$ cd ~/folder-poem/sleep/dream/engulfed-in-a-temporary-world/where-you-fall-in-a-bed-of-oceans/let-it-wash-over-you
alexabonomo$ cat _._~._~._~._~._~._~._~._~._~._~._~.txt
alexabonomo$
```

```
-bash
alexabonomo$ cd ~/folder-poem/sleep/rest-your-eyes/feel-your-body/expand-and-collapse/sinking-deeper
alexabonomo$ cat _._~._~._~._~._~._~._~._~._~._~.txt
alexabonomo$
```

```
-bash
alexabonomo$ cd ~/folder-poem/sleep/restore/your-mind/look-at-my-mind/reflect/you-mirror-my-mind
alexabonomo$ cat _._~._~._~._~._~._~._~._~._~.txt
alexabonomo$
```

```
-bash
alexabonomo$ cd ~/folder-poem/sleep/restore/your-mind/look-at-my-mind/reflect/you-mirror-my-mind
alexabonomo$ cat _._~._~._~._~._~._~._~._~._~.txt
alexabonomo$
```

# *The impetus for my thesis*

## Pulse of Anonymous Memories



*Paying homage to Daniel Hertzfelt's award-winning animations, Pulse of Anonymous Images is one's memory are displayed with projections onto sheer fabric hanging from the ceiling almost like holograms. The image that is being projection-mapped onto the fabric has photos from an anonymous being. There is a pulse sensor on a pedestal. Once there is a finger on the pulse sensor, the color channels of the image start to become offset creating layered overlapping of color interactions at the rate of the current visitor's pulse. This forces an intimate interaction with the user and the anonymous being's memories.*

# *The impetus for my thesis*

## Rain Beakon



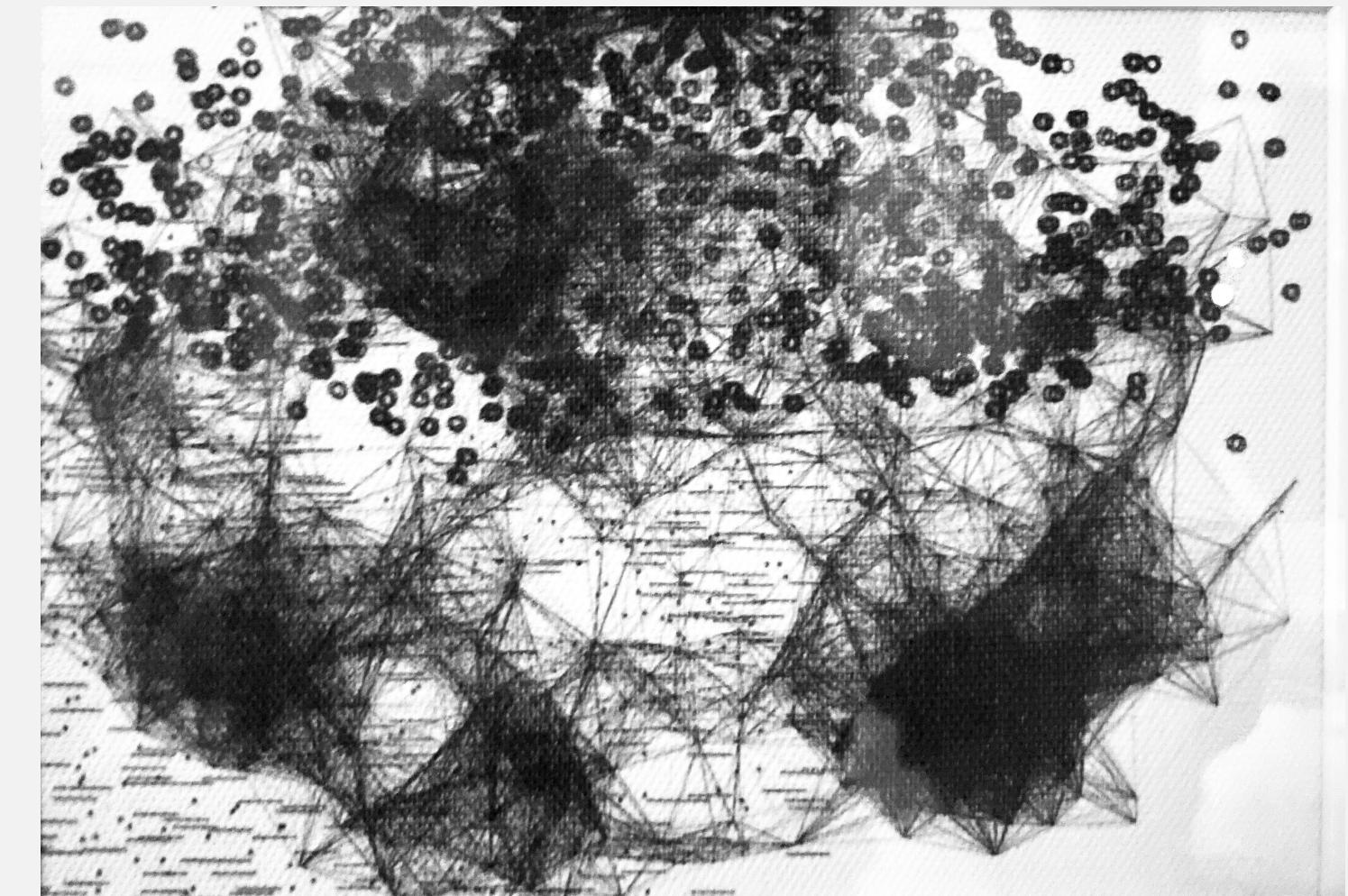
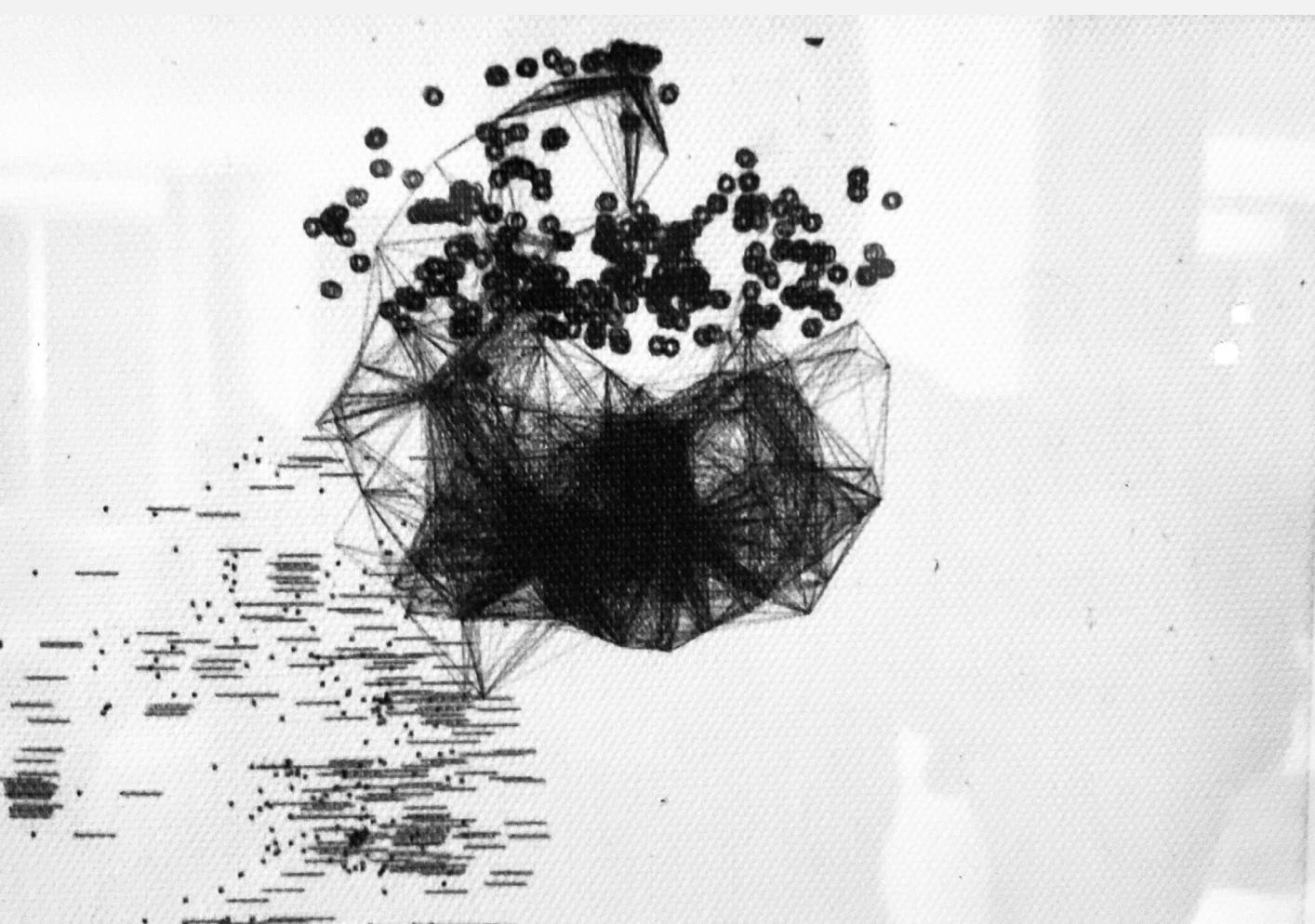
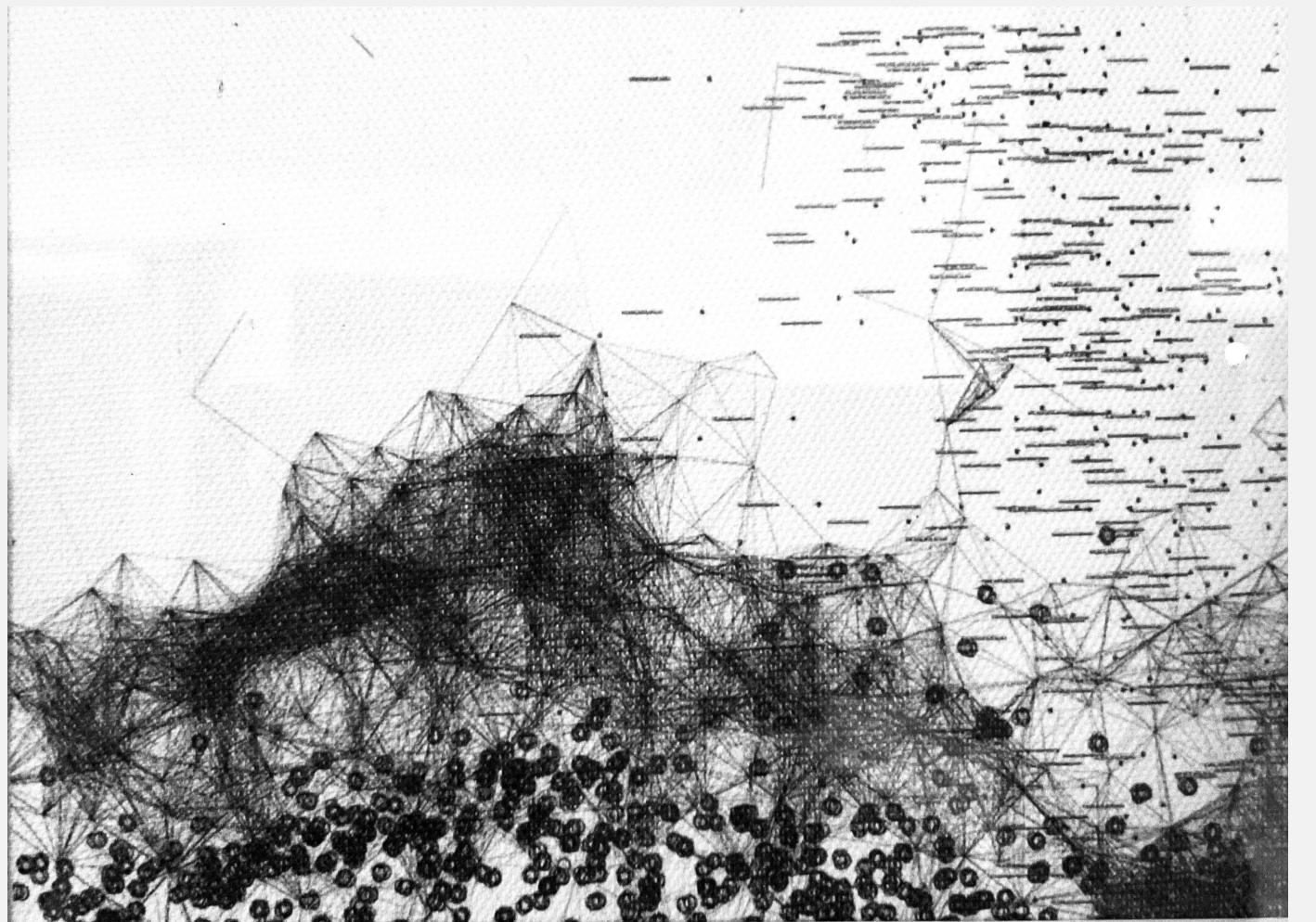
*Rain Beakon is an ode to the longing for rain and solace. Three panels of sheer fabric hang from the ceiling with a projection of rain falling projection-mapped so that only the fabrics are illuminated in the space. Rain sounds are strong when no one is present, rain sounds are calm when people are present.*

# *The impetus for my thesis*

## Sense



*Sense was the first idea to track myself using various devices and use the data output to draw on a canvas. The canvas drew out a network-like pattern that cooresponded to an accelerometer. The idea was that I could connect several sensors on a wristband and have it constantly emit data throughout the day. The result of the day would be an artistic representation generated purely by self data.*

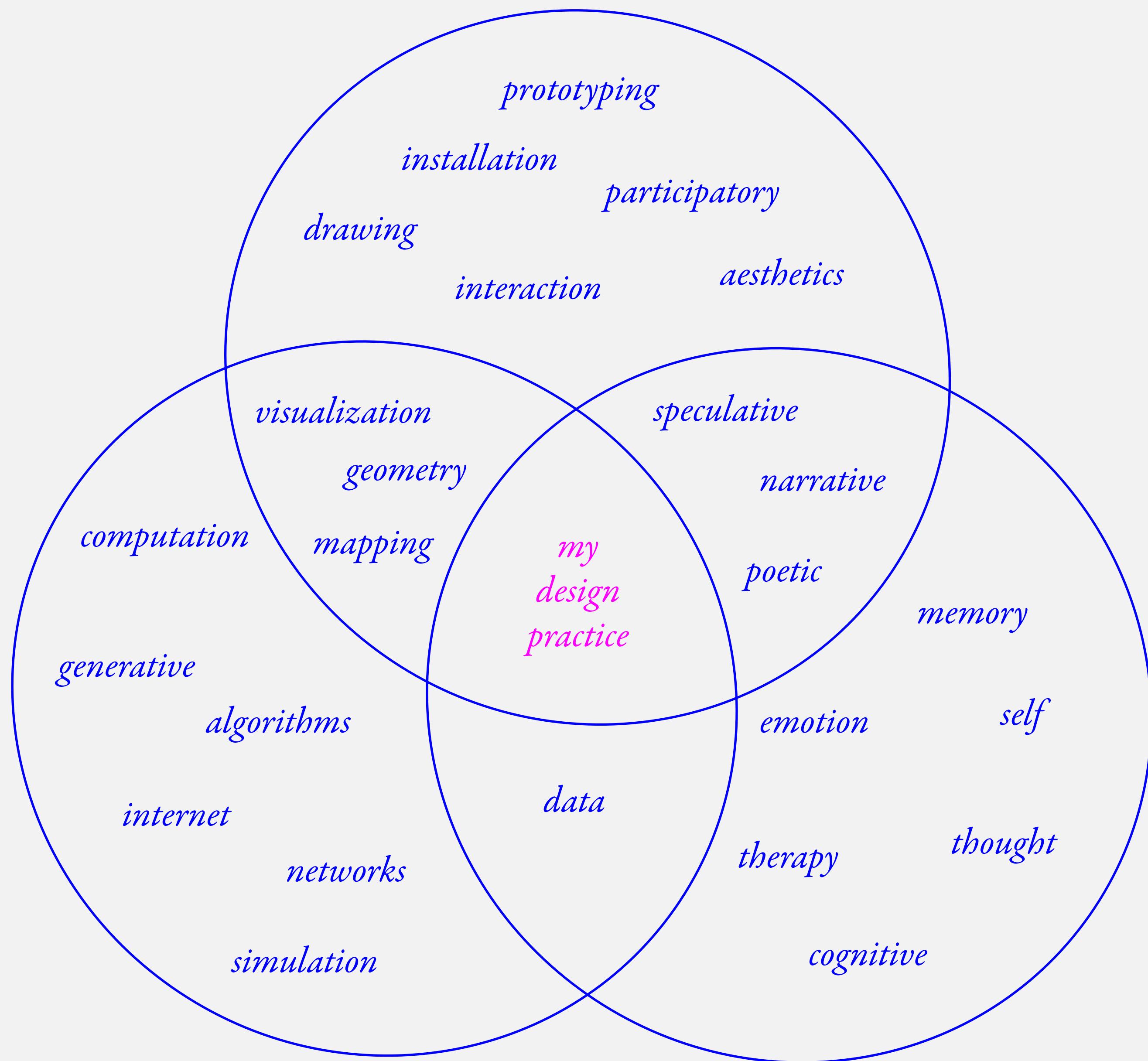


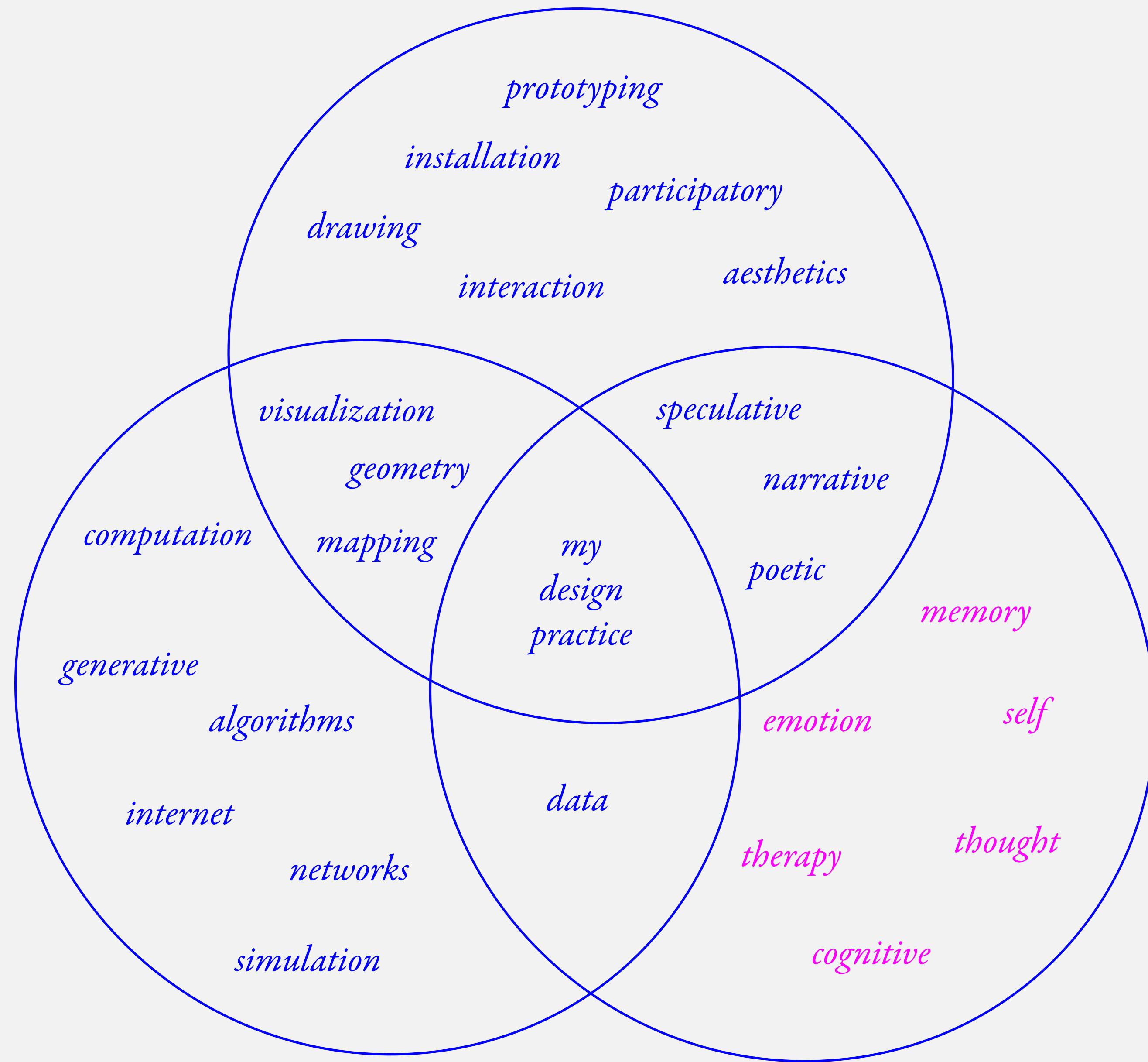
*Three captures of different activities. Playing piano, hugging, and running*

# *The Thesis Abstract ...*

*The Quantified Self is best described by Gary Wolf as “self-knowledge through numbers.” William James’ theory of the consciousness of the self and the study of coping inspires drawings that retell personal narratives at the same time reveal traces of the subtle emotion associated with intentional forgetting. Codex Endogenous is a project that reveals and visualizes the beauty and morphology of a “self” and its environment. Here, “codex” refers to a collection of pages stitched together, and “endogenous” is a term in cognitive neuroscience used to describe phenomena that is spontaneously generated from an individual’s internal state. Every day, quantifiable information about the self is produced; left unrevealed would leave the spirit of a self undiscovered. In this project, the self information is transformed into self-knowledge. Data is tracked throughout a day, categorized into implicit and explicit information, visualized as daily data drawings. Analogous to the practice of keeping a daily journal, Codex Endogenous is a digital journal in a screen-based format. It is composed of drawings that embody data representation of the quantified self in the context of environmental habituation including the intentional redaction of information rather forgotten.*

[https://vimeo.com/manage/videos/418238737?embedded=true&source=video\\_title&owner=55403415](https://vimeo.com/manage/videos/418238737?embedded=true&source=video_title&owner=55403415)





# Self

*James divided the history of self into three parts – its constituents, the feelings and emotions they arouse, the actions to which they prompt.*

*William James grouped all of the components of the empirical self into three subcategories:*

- (1) the material self,*
- (2) the social self*
- (3) the spiritual self.*

*In this work, items of data like:*

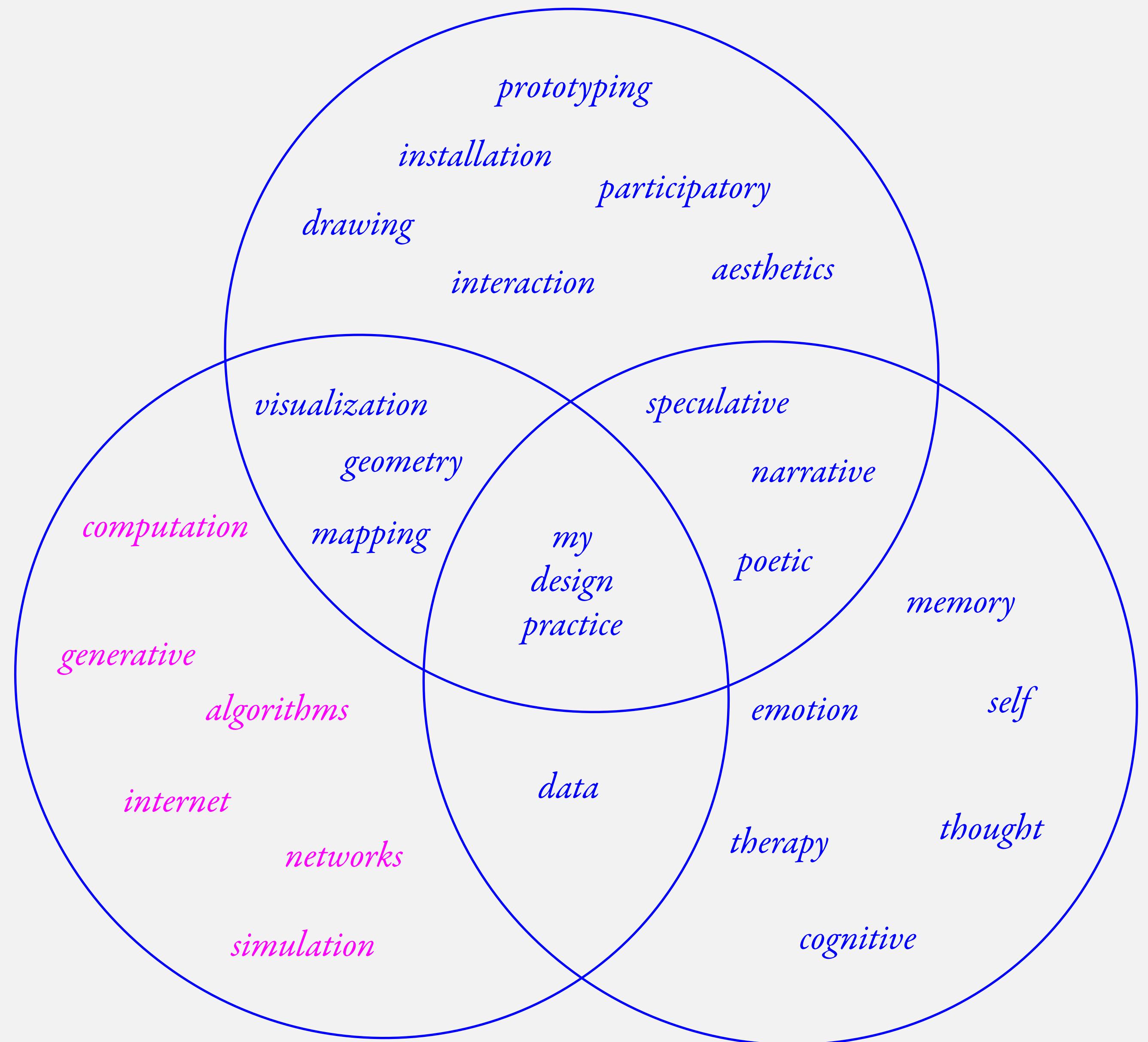
*bio-metric data,  
weather data,  
emotional data,  
thought data,  
social data.*

# Memory

The way in which personal narratives are recalled from memory structured the inflow of data that was used in developing drawings each day. The term implicit memory refers to when a participant does not deliberately attempt to collect information from the past yet memory is still expressed in the performance of a task (e.g. walking or playing a learned song on the piano). Explicit memory is exhibited when participants consciously and deliberately attempt to recollect information from the past, such as life events that are primarily sensory experiences (e.g. recounting a childhood memory of having dinner at their grandparents house) (Marsolek). Self Knowledge requires both implicit and explicit memory to form a personal narrative. The following describes the ways in which data collection parallels memory and functions as the data that makes up the self to be used for daily data drawings.

# *Emotion*

The Discrete Emotions Questionnaire developed by Harmon et al. includes “basic by prominent emotion theories” that allows individuals to distinguish emotions and determine a level of which they are feeling them. The questionnaire declares eight different broader categories of discrete emotions: Anger, Disgust, Fear, Anxiety, Sadness, Desire, Happiness, and Relaxation. Amongst these larger categories, subcategories consisting of more specific emotions.



# Generative

*Generative art is defined as:*

*Art that has been produced by the activation of a set of rules*

*The artist lets a computer system take over at least some of the decision-making*

*An intrinsic quality to generative art relies on the step-by-step rules from which it creates graphics from (Boden and Edmonds).*

*The looping nature of an algorithm can automatically generate patterns based on these rules. For instance, a simple pattern one can generate using code may be a program to create a vertical line from one point to another. The pattern would follow a rule to add an integer to the x-coordinate of the two points from which the line segment is drawn from. Then a function of looping through this rule for a corresponding number of times would generate a row of vertical lines.*

```

const d = new Date();
const date = d.toDateString();
const daysThought = document.getElementById("thought-box");

function displayThoughts(){
  const dbRef = firebase.database().ref('thoughts');
  dbRef.orderByChild("date").equalTo(date).on("child_added", function(snapshot) {
    const id = snapshot.key;
    var sunlight = weather.sys.sunset - weather.sys.sunrise; //sunrise in minutes in Unix
    const thought1 = snapshot.val().thought1;
    const thought2 = snapshot.val().newThought.thought2;
    const thought3 = snapshot.val().Thought.thought3;
    r.setUTCSeconds(sunrise);
    var rh = r.getHours();
    var rs = r.getSeconds();
    var rm = round(rh * 60 + rs + (1/60));
    daysThought.innerHTML = `Today is ${rm} minutes, ${thought2}, and ${thought3}`;
    daysThought.innerHTML += `

${date}${thought1}${thought2}${thought3}sig

`;
  });
}

displayThoughts();

var myTodaysEmotion = [];
console.log(`sunrise is: ${rm} sunset is: ${sm}`);
// ellipse(500, 500, sunlight, sunlight);

function displayEmotions(){
  let sunr = map(rm, 0, 1440, 0, 360);
  const dbRef = firebase.database().ref('sunr').push(suns);
  dbRef.orderByChild("date").equalTo(date).on("child_added", function(snapshot) {
    const id = snapshot.key;
    noLoop();
    const todaysEmotions = snapshot.val().newEmotion;
    start = 0;
    end = 360;
    d1 = start + sunr;
    d2 = end - sunr;
    d3 = d1 + light;
    myTodaysEmotion.push(d3);
  });

  console.log(myTodaysEmotion);
}

displayEmotions();

var mySocial = [];
let names;

function displaySocial(){
  const dbRef = firebase.database().ref('social').orderByChild("date").equalTo(date).on("child_added", function(snapshot) {
    const id = snapshot.key;
    const todaysSocial = snapshot.val().newSocial;
    console.log(todaysSocial);
    mySocial.push(todaysSocial);
    names = Object.values(todaysSocial);
    console.log(names);
  });

  console.log(mySocial.length);
}

displaySocial();
}

//nightime
setGradient(50, start, 15, end);
//setGradient(50, d1, 30, light, c2, c3, Y_AXIS);

console.log(`start is ${start}, sunr is ${sunr}, suns is ${suns}, d1 is ${d1}/add is ${d2}; domino is ${d3}`);
console.log(daylight);
}

```

```

// Your web app's Firebase configuration
var firebaseConfig = {
  apiKey: "AIzaSyA-Pbr8kzKiwlEm_VKj0qramJang5XPc",
  authDomain: "self-data-3aa35.firebaseio.com",
  databaseURL: "https://self-data-3aa35.firebaseio.com",
  projectId: "self-data-3aa35",
  storageBucket: "self-data-3aa35.appspot.com",
  messagingSenderId: "419685489555",
  appId: "1:419685489555:web:dbece4ea3f4759bfb9e666",
  measurementId: "G-ZMKVLZ32J6"
};

//weather data
var weather;
//main x and y
let x = 300;
let y = 300;
var counter = 0;
var x1, x2, y1, y2, yStep;

//sleep x and y
let sx = 300;
let sy = 300;
//framrate
var fr = 15;

function setup(){
  var canvas = createCanvas(windowWidth, 1000);
  //drawBackground();

  x = 300;
  y = 300;
  x1 = x;
  x2 = x;
  yStep = 0;

  canvas.parent('data-viz');
  //loadJSON('http://api.openweathermap.org/data/2.5/weather?id=5341704&APPID=f49674ab8325154a34a42d1cff090bf9&units=metric', gotData);
  frameRate(fr);
}

console.log(mySleep);
window.onload = (event) => {
  console.log('page is fully loaded');
};

console.log(myHeartRate);
function draw(){
  //newMakeHrLine();
  makeSleepShapes();
}

function newMakeHrLine() {
  var countLength = myHeartRate.length;
  hr = myHeartRate[counter];
  y1 = y - hr + yStep;
  y2 = y + 20 - hr + yStep;
  line(x1, y1, x2, y2);
  console.log(`x1 is ${x1}, y1 is ${y1}, x2 is ${x2}, y2 is ${y2}`);
  counter+=5;
  x1 += 10;
  x2 += 10;
  if (x1 >= windowWidth - 300){
    x1 = 300;
    x2 = 300;
    yStep += 100;
  }
  if (counter > countLength - 1){
    noLoop();
    console.log("Finished HR Line!");
  }
}

function makeSleepShapes(){
  var countLength = mySleep.length;
  sleep = mySleep[counter];
  //console.log(sleep)
  if (sleep == "wake") {
    //makeSemiCircle
    push();
    arc(sx-10, sy+5, 20, 20, PI, 0, CHORD);
    pop();
  } else if (sleep == "light") {
    //makeSemiCircle
    push();
    rect(sx-10, sy-10, 20, 20);
    //arc(sx, sy+5, 20, 20, PI, 0, CHORD);
    pop();
  } else if (sleep == "rem") {
    //make triangle
    push();
    triangle(sx-10, sy+10, sx , sy - 10, sx + 10, sy + 10);
    pop();
  } else if (sleep == "deep") {
    //make triangle
    push();
    ellipse(sx-5,sy-5, 20, 20);
    //triangle(sx-10, sy+10, sx , sy - 10, sx + 10, sy + 10);
    pop();
  }
  counter++;
  sx+=40;
  if(sx > 450){
    sx = 300;
    sy += 40;
  }
  if (counter > countLength - 1){
    //noLoop();
    console.log("Finished Sleep!");
  }
}

function setup() {
  var canvas = createCanvas(windowWidth, 1000);
  loadJSON('http://api.openweathermap.org/data/2.5/weather?id=5341704&APPID=f49674ab8325154a34a42d1cff090bf9&units=metric', gotData);
}

function drawMode() {
  if (drawMode == 1) {
    stroke(206, 118, 104);
  } else {
    stroke(0, 0, 0);
  }
}

function draw() {
  if (mouseIsPressed && mouseButton == LEFT) {
    var d = dist(x, y, mouseX, mouseY);
    if (d > stepSize) {
      var angle = atan2(mouseY - y, mouseX - x);
      translate(x, y);
      rotate(angle);
      stroke(206, 118, 104);
      line(0, 0, 0, lineLength);
      pop();
    }
  }
}

function displayEmotions(){
  const dbRef = firebase.database().ref('emotions').orderByChild('NewEmotion/happy');
  dbRef.on("child_added", function (snapshot) {
    const emotions = snapshot.val();
    const ids = snapshot.key;
    if (drawMode == 1) {
      x = x + cos(angle) * stepSize;
      y = y + sin(angle) * stepSize;
    } else {
      x = mouseX;
      y = mouseY;
    }
    displayEmotions();
  });
}

function resetFormFields(){
  for (let i=0; i<inputs.length; i++) {
    inputs[i].checked = false;
  }
}

function mousePressed() {
  x = mouseX;
  y = mouseY;
  col = color(0);
  //lineLength = random(15, 50);
}

for (let i=0; i<getEmotion.length; i++) {
  getEmotion[i].addEventListener("click", function(event) {
    const theListItem = document.createElement("li");
    const theCheckbox = document.createElement("input");
    theListItem.setAttribute("id", `keyCode${i}`);
    theCheckbox.setAttribute("type", "checkbox");
    theListItems.append(theListItem);
    theListItems.innerHTML += `



`;
    theListItems.append(theCheckbox);
    if (key == 's' || key == 'S') saveCanvas(gd.timestamp(), 'png');
    if (keyCode == DELETE || keyCode == BACKSPACE) background(255);
    theListItems.innerHTML += `



`;
    emotionList.append(theListItems);
    if (key == '1') drawMode = 1;
    if (key == '2') drawMode = 2;
  });
}

function keyReleased() {
  if (key == 's' || key == 'S') saveCanvas(gd.timestamp(), 'png');
  if (keyCode == DELETE || keyCode == BACKSPACE) background(255);
  theListItems.innerHTML += `

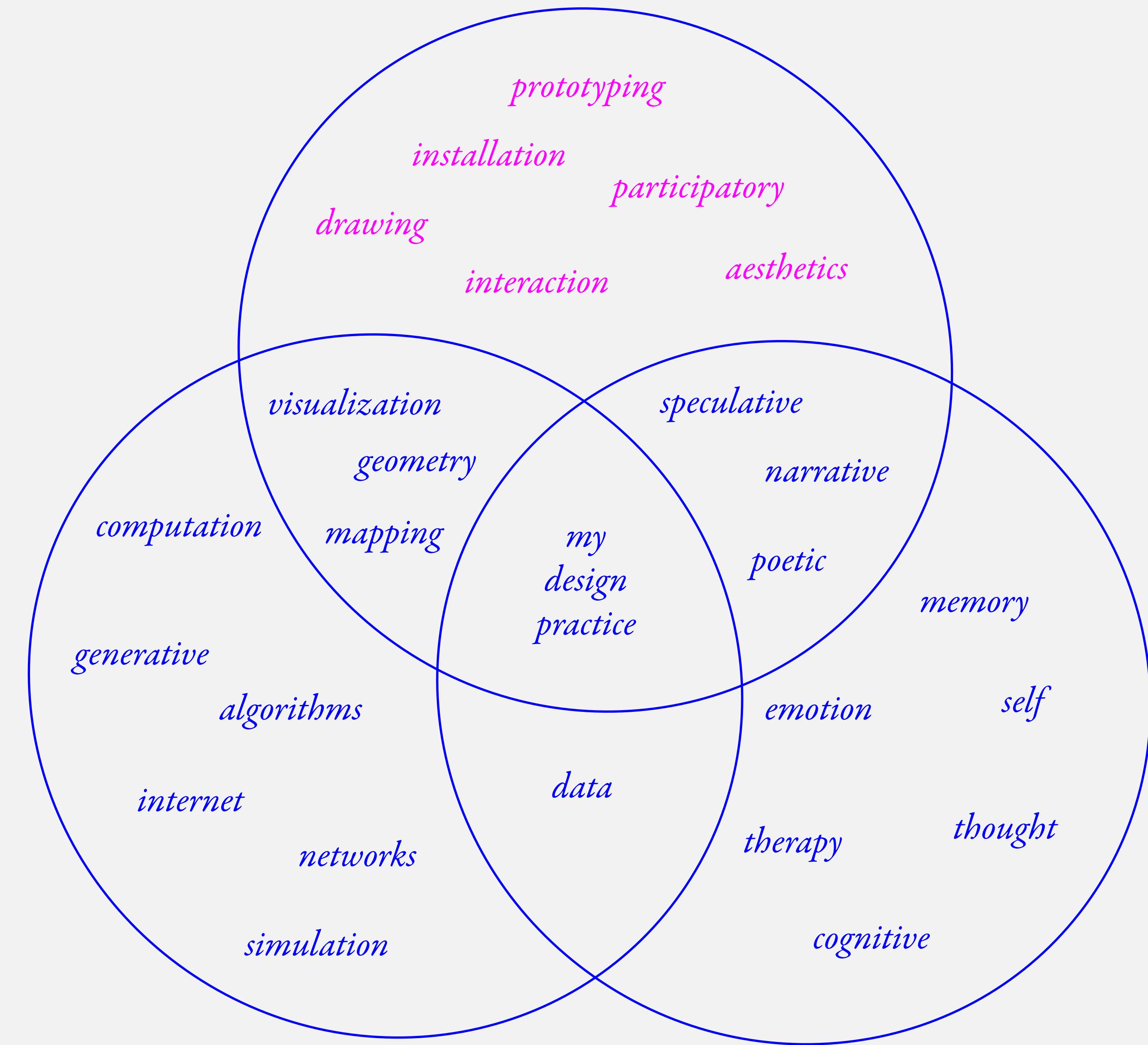


`;
  emotionList.append(theListItems);
  if (key == UP_ARROW) lineLength += 5;
  if (key == DOWN_ARROW) lineLength -= 5;
}

function draw() {
  canvas.parent("weather");
  console.log(data);
  weather = data;
}

function keyPresses() {
  console.log(getEmotion[i]);
  //lineLength ctrls arrowkeys up/down
  if (keyCode == UP_ARROW) lineLength += 5;
  if (keyCode == DOWN_ARROW) lineLength -= 5;
}

```



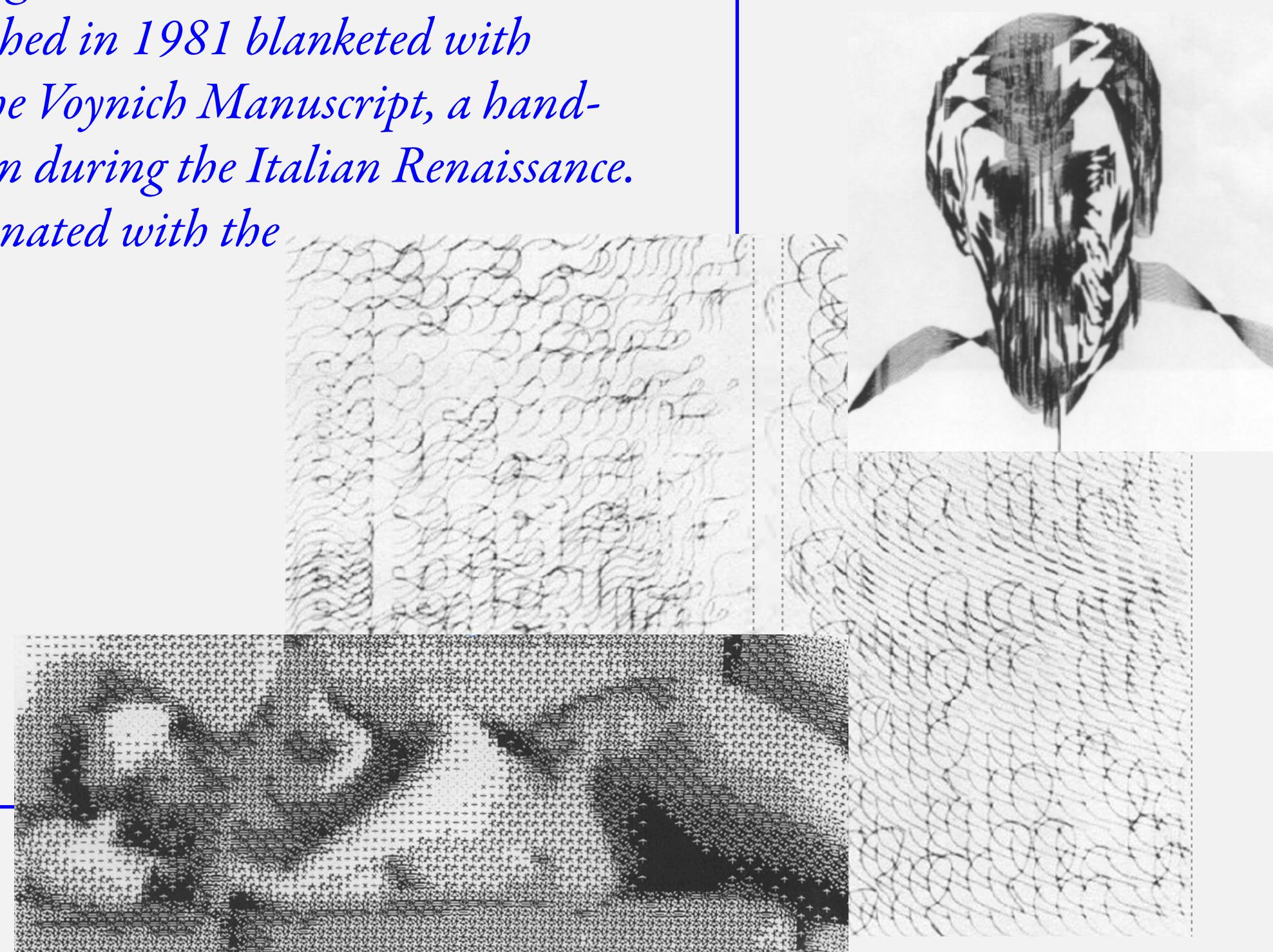
# *Meditative Drawing*

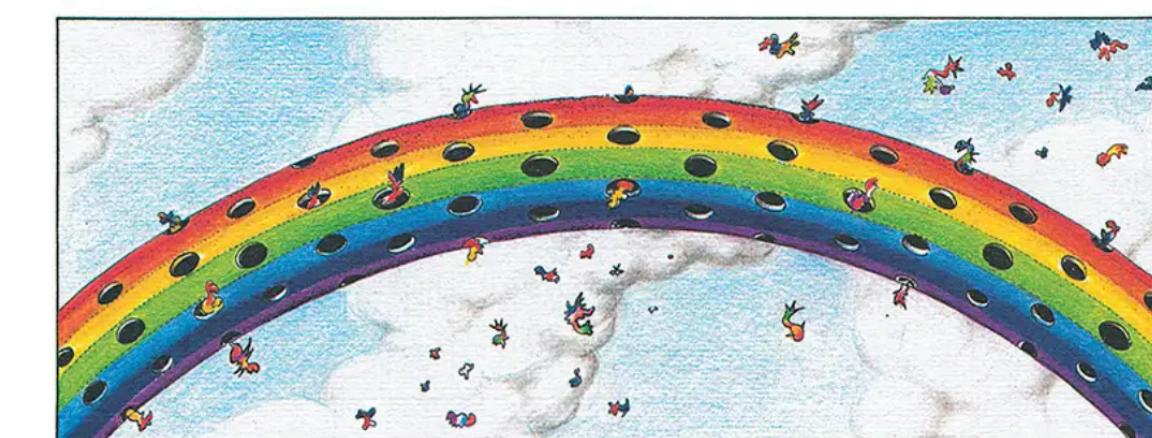
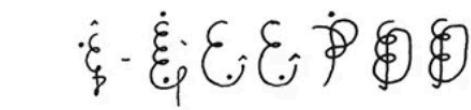
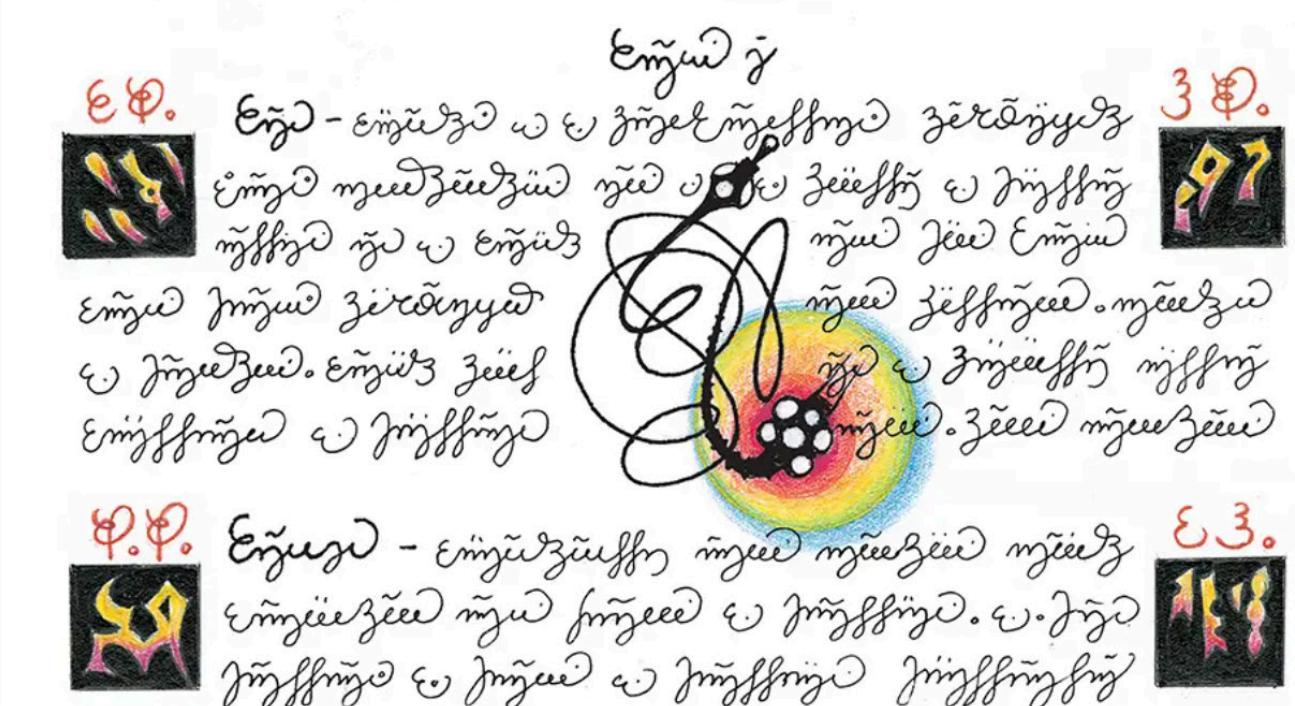


*Before I started with coding, I had a habit of creating meditational drawings as therapy. The drawings consist of patterns that are drawn in meditation over and over for a long period of time. Each pattern symbolized a new path of thinking or a new subject.*

# Aesthetics

*The visual decisions of Codex Endogenous is informed by modernist paintings, early computer art dating back to the late 70's and current research in information visualization. Starting with the name of the project, Codex Endogenous is a direct reference to Codex Seraphinianus. A mysterious 360 page book written with an asemic language by Italian architect Luigi Serafini and published in 1981 blanketed with surrealist imagery and diagrams. Even further back, the Voynich Manuscript, a hand-written codex using an unknown writing system written during the Italian Renaissance. It is still unable to be decoded to this day. I felt this resonated with the difficulty to decode one's self concept accurately.*





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# Emotion

happy												
	liking	pleasure	enjoyment	happy	enthusiasm	satisfaction	contentment	thankful	excitement	adoration	affection	optimism
relaxation												
	easy-going	love	attraction	savoring	relaxation	hoping	caring	eager	calm	chilled out		
desire												
	longing	wanting	craving	desire	need	anticipation						
anxiety												
	anxiety	alarm	stressed	horror								
fear												
	fear	scared	panic	terror	nervous	worry	dread					
anger												
	anger	pissed off	rage	hate	frsustration	shock						
lonely												
	lonely	sad	grief	empty	depression	devastation						
disgust												
	grossed out	revulsion	nausea	sickened	disgust							

# Other Marks

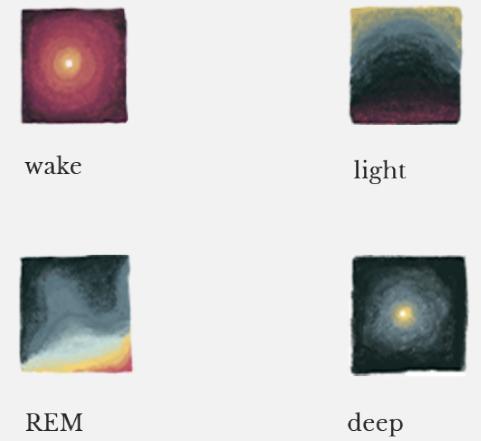
## heart-rate

b pm  
recorded every min per day



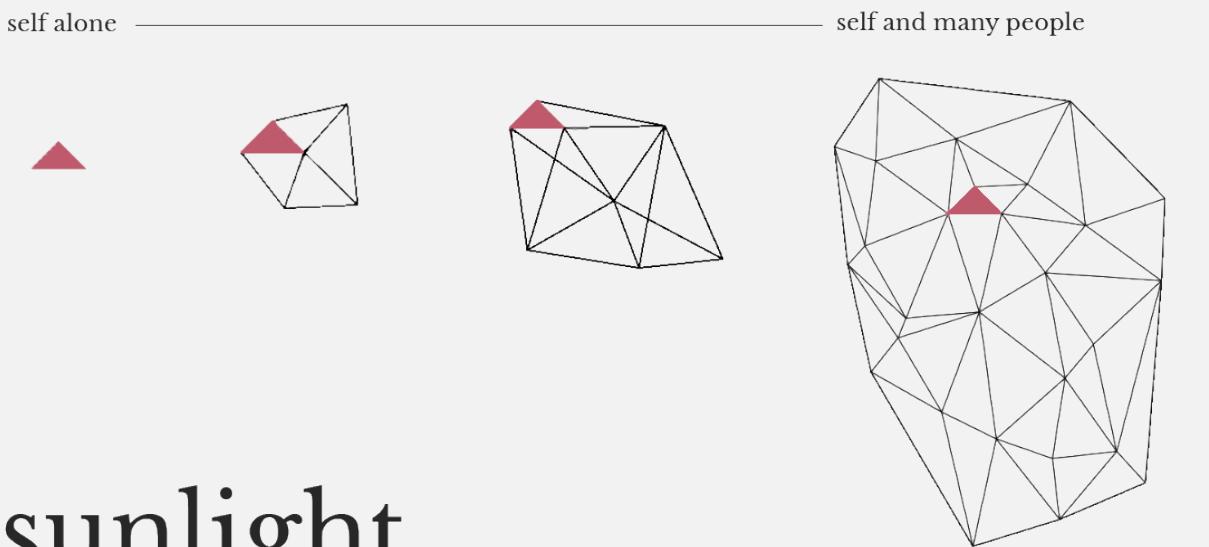
## sleep

sleep states  
recorded throughout the preceding night



## social

number of people  
each triangle represents 1 person, you are the red



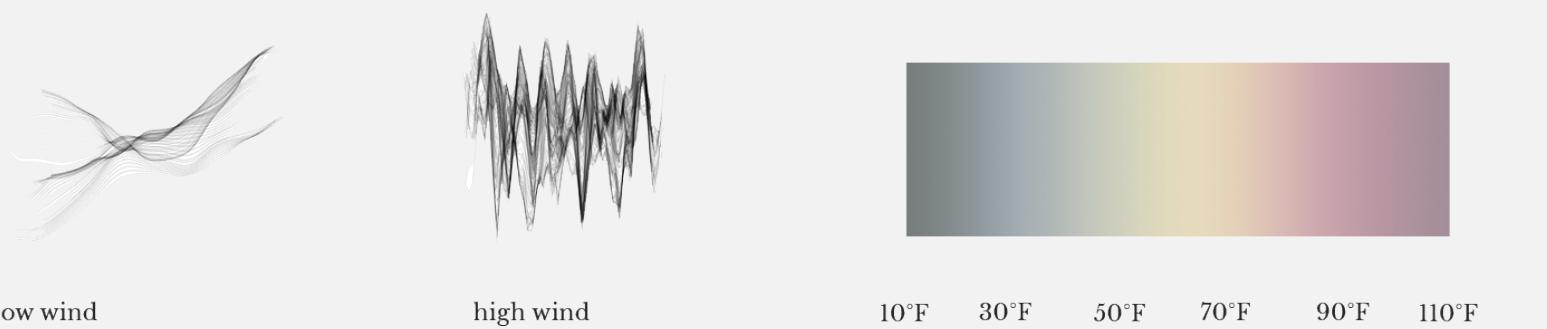
## sunlight

time  
line represents one day where color represents level of sunlight



## weather

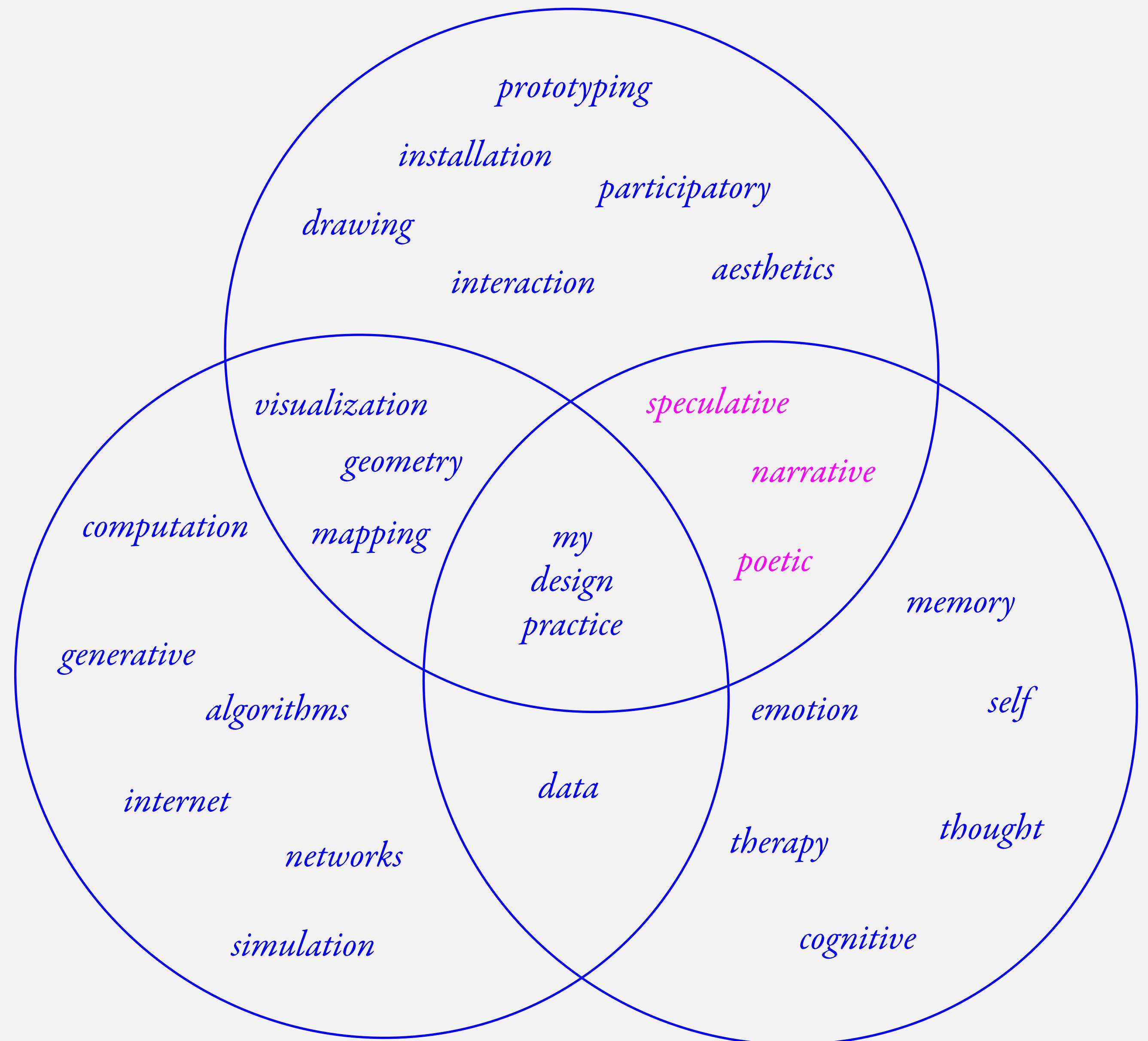
wind speed in mph at the moment  
temperature in °F at the moment



# *Interaction*

*The interface has two parts. A drawing page and an entry page.*

*Demo*



Patients with PTSD show a startling *lack of activation* in the self-sensing parts of the brain. Neurofeedback is used as a treatment that uses visualization of the “electrical symphony” of a patient’s brain waves to cause emotional *arousal* and in *return* enhances the sense of identity. Codex Endogenous aims to complete a similar feedback process to *enhance sense of self*.

# *Small Exercise*

*Think of three aspects of yourself that can be quantified or listed*

*Create a glyph for each aspect. Consider making marks that change based on its value. Why is it this glyph?*

*Construct a model drawing of patterns that represents your self data.*

*One more thing*

<https://alexaann.net/experiments/exquisitecorpse/>

# *Thank You!*

@alex.csv on instagram

lexcsv@gmail.com on email

[www.alexann.net](http://www.alexann.net)