The background of the cover is an abstract, textured composition of vibrant colors. It features a gradient from deep red at the top to bright orange and yellow in the middle, transitioning into blue and purple at the bottom. The texture is reminiscent of water ripples or a microscopic view of a material. A prominent, bright starburst with a greenish-yellow center is located in the upper left quadrant, casting a soft glow. The overall effect is dynamic and energetic.

# THE DHARMA IN THE ROBOTICIST

One Engineer's Perspective on  
Life, Buddhism, and the Heart

by Dr. Heather Knight

# mini-book



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# PREFACE

THE ACADEMIC TENURE PROCESS, after which one is either offered a job for life or summarily fired, provides many opportunities to consider one's body of work in retrospect. This book was an opportunity for me to consider my life with a similar degree of attention. After the pandemic and a heart-wrenching divorce, it was time to analyze the data, gain faith in my intuition, and invite gratitude back into my life, by first acknowledging, "Shit, girl! Pain is real." And second, "Oh, wow. Damn."

## 1ST FOUNDATION OF MINDFULNESS: BODY

About four months into the pandemic, I sprained my right ankle. Having been an active person my whole life, one who typically had had trouble sitting down<sup>1</sup>, I assumed I would be able to cross a fallen tree over a stream and impress my seven-year-old son. As it turned out, my now-sedentary lifestyle had made me vulnerable, and I fell off the tree into the shallow water with a sideways *bam!* I was only 37, but my back had started hurting after all the Spring Term zoom sessions, and now *I was having trouble walking*. Something needed to change.

At my university, we had shifted everything to video-based synchronous instruction and remote meetings in March 2020, and I noticed normal movement was minimized to reduce distraction.<sup>2</sup> Simul-

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<sup>1</sup>outside of deadline- or delight- induced flow states

<sup>2</sup>one of the rapidly developing new social norms, like when professors speak in group meetings while grad students write their thoughts in the chat"

taneously, I was required to be with my kids at all times,<sup>3</sup> so an escape for a long walk or quick run became an increasingly far-fetched fantasy. Meanwhile, I was trying to squeeze the lion's share of my work into the half-weeks my kids were with their dad. The rising tension in my neck eventually blossomed into headaches.

That's when I sought help from a dear friend and yogi who offers mindfulness coaching to women, who gave me advice on caring for my body. But I found I needed an extended crash course in self-compassion before I was able to truly make use of her advice. Almost two years later, she and I attended a five-day silent wilderness meditation, where I began authoring this book. It was there that I learned about *The Four Foundations of Mindfulness*: Body {Form}, Emotion, Mind, and Spirit {Formless}, which also serve as the structure of this Preface. These starting reflections illustrate the centrality of *Body*, breath entering and departing our lungs, and the other Foundations to our moment-to-moment experiences of and reactions to life.<sup>4</sup> This first subject of our Dharma talks<sup>5</sup>, also dubbed the *form-based world*, includes all things that are physically existent, from atomic structures to solar flares, from 700-year-old trees to robots that deliver iced coffee (plz don't forget the straw).

## 2ND FOUNDATION OF MINDFULNESS: EMOTIONS

The honest truth is I am writing this book because I have a broken heart, like some kind of tin woman in search of a solution that has been inside me the whole time. I loved my husband, but we didn't work out. After six years, I finally found another person with whom I felt a deep and true connection. Hope blossomed, wafted its lovely fragrance, and summarily dropped its petals. ☸ And do you know what the last thing

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<sup>3</sup>schools closed, grandparents forbidden

<sup>4</sup>As a teacher, I know that beginners in any field often relate best to advanced beginners, and I hope to share what I have found impactful/inspiring.

<sup>5</sup>The nature of reality: universal wisdoms accessible to anyone through insight and practice. At the retreat, our guide used the *dharmatalks* to relate the teachings of the Buddha, focusing on the Four Foundations. My mindfulness coach described dharma as being truly generous: "it really includes everything."



a heartbroken person wants to hear is? Well, I will tell you: “the wound is the way.” The only way out is in. (Nooooooooooooo!)

There is room for everything. (1) Acknowledge but do not cling to joy. (2) Open arms to the difficulties of pain, inviting anger, fear, sadness, shame, jealousy, and whomever else to tea<sup>6</sup> – not all the time, but when we can. After all, they meant me well; they were trying to keep me safe.<sup>7</sup> And, perhaps most importantly,<sup>8</sup> (3) by noticing the many things in our life that are neither positive or negative, we can center ourselves in the vast spaciousness that is neutral. Like the things we may not usually attend to but that are everywhere: parts of our body that don’t hurt, food that is okay, leaves ruffling in the wind, people we do not have strong opinions about, the feeling of clothes on our skin. This feeling is here. Now it is gone. *Neutrality* can anchor us in the constant change.

In practicing self-compassion for what arrives, we can begin to welcome our negative experiences (“*of course you feel this way*”), discover our suffering can help us relate to others (“you are not alone”), and have gratitude<sup>9</sup> for all aspects of our life path (*gasp!*), because how else could we have arrived where we are (“this too is nature”). † † †

### 3RD FOUNDATION OF MINDFULNESS: MIND

At our retreat, they suggested that mental processes were often tightly tied to emotions. If one feels ashamed, for example, one might trace back to the context, body memory, or sequence that anticipated that feeling. For example, “I am trying to author a book, and have several degrees, why can’t I spell correctly?” [*Hello, critical Heather, welcome to the prelude.*] This is a common one for me. For most of my life I have had a love-hate relationship with my dyslexia.<sup>10</sup> When I feel good, I will

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<sup>6</sup>the key is our reaction: it is resistance that transforms pain to suffering, acceptance multiplies the largest of difficulties by a factor of zero. [*oob! an equation*] {{like offering the part of ourself that hurts an unconditional hug and warm beverage}}

<sup>7</sup>however misguidedly

<sup>8</sup>this one was a surprise for me

<sup>9</sup>the antidote to anger

<sup>10</sup>{{ *Hello judgement. Would you like some tea?* ☺ }}

argue for my mild neurodivergence: (1) perhaps it helps my creative mind; (2) not noticing mild differences in letter orders<sup>11</sup> also helps with comprehension across European languages.

As a roboticist who studies and develops artificial social and emotional expression, it may not come as a surprise to learn that I have some wonkiness myself. Ironically, my study of myself began the same year that I started my PhD; I went into counseling for the first time in 2010. I've tried various approaches, but it was Tara Brach's work that helped me see the biggest gap in my understanding. Her R.A.I.N. technique stands for recognize, accept, investigate, and nurture. As I scientist, I thought I might have an inkling of what the 'I' meant, but the rest of the letters were basically gobbledygook, particularly as they related to understanding, accepting, and offering care to *my own* emotions.

This nurture and compassion-for-self thing was eminently missing from my childhood and familial role models. My dad grew up on a farm in south Texas, where he once pulled his 5-year-old sister out of a drainage ditch by her hair, narrowly saving her life. My mother grew up in a storied Irish immigrant family that started a small business. In both, family members were expected to work hard and stifle complaints (or at the very least, not get in the way). As is common in my culture and somewhat patriarchal extended family, care is something I implicitly believed I should offer others but not myself. I was shocked to learn that self-reliance could also mean scheduling several days to cry, reflect, and battle mosquitoes. In reconsidering the stories we tell, however, mental processes can change, and that is why beginning to notice the patterns of our mind (and heart) can be so powerful.

#### 4TH FOUNDATION OF MINDFULNESS: AWARENESS

“Do not believe in something because it is reported,” the Buddha says. “Accept as completely true only that which you test for yourself and

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<sup>11</sup>kaffe, café, kaffi, caffè, kaffi, kahvi, καφέ

know to be good for yourself and others.”<sup>12</sup> Here is the poem that arrived in my notebook on our fifth day in the wilderness, some hours after we were encouraged to let awareness lead awareness.

### **Flying Cars**

The forest hums loudly if you stop to listen.

I can't help imagining a futuristic world of flying cars  
— zipping here and there.

where do you travel to, so fast, dear insect?

have you ever heard of slowing down?

have you heard of the connect to the infinite within?

What's that dear insect?

your life runs shorter, so you experience time at a different rate?

you don't want to get eaten? or slapped?

who am I to council you when your life is not mine?

stepping back, perhaps I can notice rather than direct.

To be honest,

I also find myself racing down the forest path

when a mosquito buzzes in my ear,

hoping to outrun pain, fear,

to make my way

through the beautiful shadows.

Sometimes we also need to move

beyond and through.

Shall we begin?

---

<sup>12</sup>There of 84,000 dharma doors, “a metaphor to basically state that their are innumerable paths to enlightenment, a representative teaching to the Buddha's tolerance for other religions.” Find the ones that work for you.

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*by*

*Dr. Heather Knight*

dharmabot

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# CHAPTER I

## THE EARLY YEARS

WHEN I WAS AROUND 6, AN OLDER GENTLEMAN IN the airport gave me a dollar, saying I was pretty. My mother handed him back the dollar and said, “She’s also smart.” I’ve always found airplanes [and airfoils] fascinating. Marvels of engineering, literally flying through the clouds, encased in metal. One can leap from one part of the Earth, and culture, to another in mere hours.<sup>1</sup> Aviation is a big part of my personal experience of how technology opens access to and experience of a larger world.

### I.1 WAYS OF SEEING

Earlier this year I convinced my mother to do therapy with me. She’d taught me to be a feminist at a young age, not with any mention of that cursed word *should* but rather by being a badass herself.

We put so much emphasis on romantic relationships in this culture,<sup>2</sup> but some of the most influential relationships in my life are broadly inclusive: friendship, mentorship, an interesting conversation with a dentist on an airplane, watching other mothers who do not realize I can

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<sup>1</sup>what wonder!

<sup>2</sup>or maybe I just took the Disney movies too seriously

understand their conversation at a playground in Madrid.<sup>3</sup> And yes, so many inspiring collaborators, art-makers, creators, and dreamers. Look at the objects around you that someone or a whole group of people designed. They were thinking of you sipping that coffee, and might be delighted to imagine you emanating your zest for life on their B&W picnic blanket with a view of mountains and Brie cheese that has melted into a hot mess<sup>4</sup> but still tastes amazing.

Look at existence itself. Sure, it sucks sometimes, but not all the time! We have sent spacecraft beyond our solar system. Elon Musk is convincing millions of people that UFOs are real.<sup>5</sup> And if technology, human society, and product design are not your jam, perhaps you would appreciate the strange wonders of biology: the way fuzzy fruit bats can repopulate rainforests by pooping out seeds; the fact that there are animals that eat mosquitoes; the majesty of considering how much of our planet is fully populated but untouched by humans.

So if the world has the potential to have so much wonder and consideration,<sup>6</sup> why do we all walk around wearing so much armor?<sup>8</sup> Are we like those little flying cars? Driven by fear (or hope), motivated by hunger and curiosity?



## I.2 THE END OF SUFFERING

I deliver these words to you not because they are new, but so you can have them at your easy reference. The Buddha teaches one thing and

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<sup>3</sup>yes, you guys seemed totally cool; if we hadn't had a flight home the next day, I was fantasizing about becoming your friends

<sup>4</sup>shoot, it is just like me to forget napkins on an imaginary picnic ♥

<sup>5</sup>Editor's note: the author is not arguing that Elon Musk is in league with the aliens, but rather that a string of lights passed some receptive meditators on a starry night. We now think it was SpaceX's Starlink, offering internet via strings of satellites.

<sup>6</sup>my younger son told me I was too happy when I fell in love,<sup>7</sup> and asked me to say one complaint for every happy reflection, such that the sum would be zero

<sup>8</sup>I mean, I have a pretty good excuse for shiny armor with my name and all ✨



one thing only: *the end of suffering*. Pain is inevitable; suffering is optional. We are always capable of changing. Our cells completely replace themselves every two years or so. Everything will change. That is the nature of life. I am no more special than you. If I can struggle and recover, and struggle and recover again, so can you.

As a high-achieving “gifted child,” with two parents who departed their families<sup>9</sup> like 4th of July fireworks, I sometimes have a bit of savior complex, thinking I could fix their marriage, help the world with my robots,<sup>10</sup> and teach young minds not just to make amazing, impactful things, but also to believe in themselves. Would that our interactions leave you with a sense of hope.

Post-divorce, post-pandemic, post-being a person in these trying, awful, wonderful, and neutral times, it has come to my attention that what we seek to offer others is often what we need to offer ourselves. It turns out it was not you; it was me.<sup>11</sup> I am the one who needs to change, to find hope, to do something different. Just like you are for yourself. The fact that we’re the source of the problems and solutions is a truly terrifying insight, but confidence is built by repeated positive experiences. And as I meet my promises to myself, I feel a growing faith.

### I.3 TEN HINDRANCES

I read this list in the Sisters Mountains, OR on our silent retreat. It is from *Right Understanding in Plain English: The Science of The Buddha’s Middle Path*, published by the Vipassana Foundation in 2000:

1. The belief in a permanent personality / ego.

---

<sup>9</sup>Both of my parents were in the first generation of their families to attend college. After her psychology degree, my mother served in the Peace Corps in Brazil in the 1970s, and my father, who had only able to attend university because of a football scholarship to Texas A&M, went on to earn a PhD in aeronautical engineering, moving to Boston area to do a postdoc at Harvard, eventually meeting my mother.

<sup>10</sup>Honestly, I was afraid my mother would stop loving me otherwise.

<sup>11</sup>forgiveness offers me freedom, and can coexist with taking space from actions that would otherwise cause me harm

2. Doubt / extreme scepticism.
3. Clinging to rites, rituals, and ceremonies.
4. Attachment to sense desires.
5. Ill-will / anger.
6. Craving for non-existence or existence in the Form World.
7. Craving for non-existence or existence in the Formless World.
8. Conceit.
9. Restlessness.
10. Ignorance.

## I. 4 SANGHA & THE MIDDLE PATH

Perhaps you are thinking, “I don’t think I can do this by myself.” I feel similarly. It is literally impossible.<sup>12</sup> Sangha refers to the community of people who support each other along their spiritual paths.<sup>13</sup> I was on the track team in high school, and since then it has never been so easy to motivate myself to exercise. There were spaghetti suppers the night before meets, T-shirts to decorate, slogans to shout, and a community of other women, all of us cheering each other on, each completing our independent competitions,<sup>14</sup> but also working toward a common goal.

In the six years I have lived in Oregon, I have noticed locals are peer pressured to take the middle path between existing in society and disappearing into the mountains. The joke in Portland is that “going out” means they are leaving the city: driving to a *shimmering* river, or heading backpacking during flower-break on a mountain with limited, coveted passes for hikers. Sangha via trees, water, and nature.

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<sup>12</sup>[[*Wait a second, didn't you say two subsections ago that you are the source of both the problems and the solutions?* ]] {{ Sometimes plants need sunshine to grow. ☺ ☺ It's that simple. Lean toward what is nourishing }}

<sup>13</sup>Sangha is considered one of the three forms of refuge while seeking to understand the nature of reality, alongside Dharma and the Buddha, a.k.a. The Triple Gem.

<sup>14</sup>my best events were 800m (two circles around the track, the torture of being a middle distancer being that it is both a sprint and a long distance) and shot put.

# CHAPTER II

## >> FORM †

I'D ONCE TOLD A REPORTER AT CARNEGIE MELLON University that I would be wearing a pink dress – one of the little clues you give people to help them find you at a glance. Upon arrival, he guffawed, “why didn’t you also mention you were pregnant?”

Why yes, I do appear to be carrying a child in my belly.<sup>1</sup> At the time, I was a robotics PhD student, getting ready to do my thesis proposal.<sup>2</sup> To his point, I was well into my third trimester. The funny thing about male-dominated fields – engineering, comedy, startups, *film making* – is you try to fit in.<sup>3</sup> Pregnancy was a turning point for me in admitting I was female.<sup>4</sup> Turns out we can be many things at once.

### II.1 GREAT MYSTERIES

Hello my darling. Do you truly think I’m a demon and should seek out my demon friends? The world does not spin around me, and I am inviting a letting go. But there is also a special chamber in my heart that

---

<sup>1</sup>Wowie. That crazy biology thing again.

<sup>2</sup>On minimal social robot body language, specifically, expressive motion.

<sup>3</sup>Luckily for both running and my career choices, my breasts are rather compact.

<sup>4</sup>Not just when it was convenient for me, like if I was out dancing with friends and hoped to find someone who would spin me. But all the time.

I have been decorating for you in case the fates would have you return. It has the appearance of a room in a castle, but is quite cozy [[*just added a fireplace*]]. Tall wooden bed frame anointed with silk draperies by servants in pied stockings in medieval shades.<sup>5</sup>

I was looking at color cards, and am curious about your opinion. {Do you like stripes? [I had an vision that vermilion and ochre would look nice together] }<sup>6</sup>

## II.2 THE FORM-BASED WORLD

After a few years learning about Mechanical Engineering,<sup>7</sup> it was easy to notice the world as collections of objects. Hammers see nails. Just like waterjets realize CAD-commanded-unusual-object-shapes-that-make-rapid-prototyping-and-flexible-literal-designs-user-friendly-and-efficient-to-create.<sup>8</sup> Much of science, language, and logic is establishing relationships between ‘A’ and ‘B.’

Some people ask how I got into robotics (more on that in II.3), but the real answer is, I was trying to spend my summer in Dublin.<sup>9</sup> They say lucky people do not necessarily have more opportunities than other people, it is just that they are more open to noticing and accepting them. And I do not know whether I am lucky, but I do have Irish dual citizenship. At the time, the *Media Lab Europe*<sup>10</sup> was centered in Dublin. Like any bright-eyed and ambitious budding engineer in the early internet age, I found an email address, composed a letter of interest, and scored

---

<sup>5</sup>Is praying the only thing I can do for you? I don’t have much experience but am open to trying new things. It sounds a bit like meditation, not in theory of course, but in practice. Do you want me to care for myself? Sometimes I wonder what is real.

<sup>6</sup>Hewn stone seemed a better character match than a small Brazilian island.

<sup>7</sup>from solid-modeling to laser cutters, the flexibility of cutting and dying holes in metal, machine shops with safety goggles, hairtye, and closed-toe shoes, orange-smelling abrasive hand-soap for oily hands, Loctite anywhere there might be shaking.

<sup>8</sup>Am I right? Try the veal.

<sup>9</sup>It’s wild how unexpected sequences of events can change your life direction.

<sup>10</sup>unfortunately, since shut down

a brief phone interview. On said call, my prospective researcher advisor asked me what I knew how to do. I responded, “I’m a freshman.”

Although I did not secure that summer research position, my never-to-be advisor’s interview question led me to an important insight: I was probably going to need to learn how to do something. So after classes that day, I went back to my living group, the Number 6 club,<sup>11</sup> and announced at the dinner table that I was looking for an opportunity to create and build. A senior named Dan nonchalantly replied that his robotics lab was “probably hiring.” I never made it to Dublin, but I have been in and out of robotics for the 20 years since.

## II.3 THEATRE & ROBOTICS

*How did you come up with the idea to incorporate theatre with robotics?<sup>12</sup>*

My personal history led me to robot theatre in the following sequence: (1) Interning at a robotics lab led by Prof. Cynthia Breazeal at the MIT Media Lab and learning from grad students. (2) Building technology-based interactive art installations<sup>13</sup> while beginning work toward publications in social robotics. (3) Working for NASA JPL which is adjacent to lots of entertainment people in Los Angeles. (4) Building a British VMA-winning Rube Goldberg Machine for an OK GO music video<sup>14</sup> (5) Writing a personal essay about entertainment+robotics while applying to PhD programs. (6) Serving as a graduate researcher with Prof. Reid Simmons at CMU, who had already had some active collaborations between robot in theatre (e.g., the RoboReceptionist or Victor GameBot, greeting people and playing scrabble). (7) Making a robot

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<sup>11</sup>Formerly in a swanky neighborhood in Boston, but right on campus in its current 4-floor iteration with predominantly international students, maroon leather furniture, and a smattering of culturally enthusiastic Americans.

<sup>12</sup>A high schooler who was doing research in a college robotic research lab reached out about her future potentials in robot theatre. This was an excerpt from my replies.

<sup>13</sup>some invited, some for fun

<sup>14</sup>“This Too Shall Pass - Rube Goldberg Machine” by OK GO

comedy system on a lark<sup>15</sup> for a class project with Prof. Drew Bagnell on probabilistic robotics. (8) Attending an O-Reilly Media “unconference” called Foo Camp that led to an invite to TED.<sup>16</sup> (9) Speaking at a TED conference the same day as Hillary Clinton and Cynthia Breazeal, my former advisor at MIT (*no pressure*), leading to feedback from interesting people and wide exposure. (10) Founding the Robot Film Festival<sup>17</sup>, which ran for 9 years. (11) Continuing to do research, writing, talks, and public exhibitions of entertainment and entertainment-inspired robot systems, as an academic, robot stage mom, professor, research lab manager, and public speaker.

## II.4 ART IS SUFFERING

My first independent robot art project was an all-analog robot bunny rabbit on wheels. Constructed of paper maché over a wire frame, the bunny had IR sensors in the ears and was designed to chase its companion paper maché carrot, which was dotted with IR-emitting LEDs. I had stubbornly made the whole thing analog,<sup>18</sup> with the intention of handing the carrot to the gallery visitors, the net – *groundingbreaking* result – being that the rabbit will chase the carrot.<sup>19</sup> The way it worked was that the IR signal level, detected by the sensors in the rabbit’s left ear, would drive a proportionate signal to the motor controlling its

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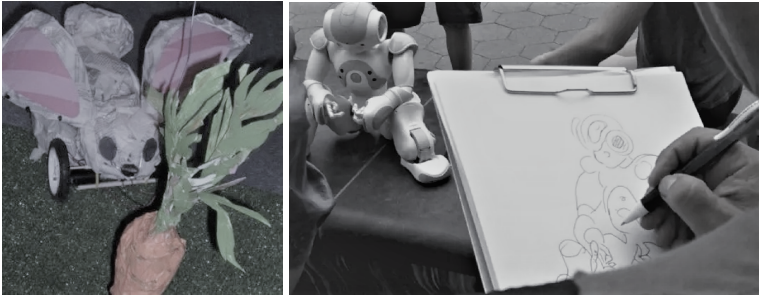
<sup>15</sup>I had bought a Nao robot instead of a car as a new grad student (similar pricing).

<sup>16</sup>Pro tip: Be the person at the party with a robot.

<sup>17</sup>Archives available at [robotfilmfestival.com](http://robotfilmfestival.com) – founded with Marek Michalowski and Chrys Wu, and later co-run with chessboxer and robot-rat landmine removal proselytizer Andrew MacGregor. The goals were to create a community for people working at this intersection or having interest in robots+entertainment, and to promote positive storytelling about robots, as entertainment can playfully prototype the future, perhaps even persuading technology creators to focus on social impact, or influencing funders as to what would be worth investing in.

<sup>18</sup>Microcontrollers need not apply!

<sup>19</sup>Whatever motivates you, right?



right wheel and vice versa. So if both ears received signal, it would go straight. But if the right signal was stronger, the left wheel would turn more, resulting in orientation toward the carrot's current position. It was very satisfying to get that working in the wee hours of the morning, one late night in the lab (left image).

When we arrived at the gallery space in Central Square for setup in broad daylight, however, I discovered the large museum windows meant that the bunny's IR detectors were flooded with sunlight like an overexposed photo. Despite how great the astroturf and miniature white picket fence looked, the robot would not work. At all. The strong emotional attachment I had had to the purity of analog electronics was that day broken quite practically. It is not that I could not have found a solution – pulse the signal or otherwise evade the physical realities<sup>20</sup> – on the other hand, I had a life to live, and more ideas than time. So falling back on validated and tested integrated circuits<sup>21</sup> and the i's and o's they produced – now sounded positively delightful.

Engineering is highly integrated with physical realities. Bridges vibrate in the wind, touch restores. Nothing like failure to make you pay more attention next time you get your robots in front of an audience.<sup>22</sup> Admitting reality, however, sometimes brings up uncomfortable feelings and thoughts.<sup>23</sup> What then?

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<sup>20</sup>perhaps adding a curtain, or exhibiting in a room without sunlight, but who wants to live without sunlight??

<sup>21</sup>with glorious data sheets!

<sup>22</sup>My Nao robot post-first-show in Washington Square Park, NYC (right image)

<sup>23</sup>{{{the inner loop} can take some time } I+I } esc}

# CHAPTER III

## >> EMOTION

THINGS THAT ALL HUMANS HAVE IN COMMON: (1) WE want to be seen, (2) We are afraid to be seen.<sup>1</sup> I dropped my hot tub off at a dumpster, and have a new reflection spot where it used to sit, under the open sky and stars. I paused writing for a month to not-lose-my-job and welcome the change of seasons. Bought a book about the Dutch Art of Nixen, have swapped floral bouquets for candles – everything has changed!

### III.1 NON-DUALITY

My maternal grandparents' relationship was founded on an imprecise truth. She had emigrated on a boat by herself from Ireland to Boston at 16 years old. It took two weeks to make passage across the Atlantic, and three years for her to save up enough money to return home.

She lived with her aunt and a cousin who was a Catholic priest in the Greater Boston area and worked as a cook for a family, making their meals six days a week. Once she potted a pineapple that the family she

---

<sup>1</sup>this is an aphorism from my BetterHelp therapist, Lauren, who did not ghost me



worked for later asked for from the dinner table, 1: “Betty, where is the dessert?” 2: “What dessert?”, 1: “The pineapple?”, 2: “The pine-what?”<sup>2</sup>

My grandmother had met my grandfather at a Boston dance hall – think of it as Irish night. Shortly after, she took that long-awaited trip home.<sup>3</sup> Imagine what it would be like to have left home at 16. To wait three years to see your family again. On this auspicious occasion, my 19-year-old grandmother decided to carry a baby doll in her arms to play a prank. 3: “Who’s that coming down the way?” 4: “Is that Mary?” 3: “Everyone, Mary is coming!” 5: “Oh my goodness, what does she have in her arms?” She had them imagining all kinds of reasons for coming home from Boston. 5: “Nearly gave me a heart attack, she did.”

By the time she next saw my grandfather, six months had passed. According to family legend, she nonetheless marched right up to him, asking, “Do you remember me?” She was a diminutive 5’3” to his 6’1.” Without missing a beat, he assured her, “Of course I do!”<sup>4</sup>

### III.2 IN A WORLD OF CONSTANT CHANGE

*In a world of constant change, neutral things are what we can rely on:*

The predictability of the sun down and the sun up.

That seasons will change, and return again.

*This is why one’s breath<sup>5</sup> works well as an anchor:*

Compassion brings calm waters.

Storms shorten our inhale.

*Co-regulation can also be powerful.*

And, apparently, dubstep.

---

<sup>2</sup>{(What is truth?)} The pineapple could have had a happy life as a potted plant had societal mores been different. Who’s to say?

<sup>3</sup>to a farmhouse in northwest Ireland, where she’d grown up with her nine siblings.

<sup>4</sup>[This is the lie] The rest is her-story (say it out loud).

<sup>5</sup>The repetition of the breath varies more than a metronome, but is as reliable.

Since relocating from Pittsburgh to Oregon, I have enjoyed becoming part of the local ecstatic dance community.<sup>6</sup> It is cathartic to dance and move, and each beat presents its own breadth of possibilities. If people ask how I got into dance, I tell them my robots did it first.<sup>7</sup>

My PhD thesis had adapted a system from dance and human acting training called *Laban Effort System*, which was originally developed to annotate the expressivity of a dancer performing a particular motion – not the what, but, specifically, the *how*. For example, I might step my whole foot into the pond, or merely dip a toe. Both involve submersion, but different attitudes toward trust, immediacy, and commitment.<sup>8</sup>

The social contract at ecstatic dance calls for no talking on the dance floor, as it is treated as a movement meditation. The DJ typically choreographs an experience of low- to high-energy music, then back to rest, over a two-hour period or so. When it was on Sunday mornings, we sometimes called it dance church, though it can be held at any time.

It usually takes me about a half hour to get out of my head, at which point there can be moments of Zen, acceptance, openness to feelings that were suppressed – all guided and encouraged by being in community.<sup>9</sup> Not always, but sometimes. This playfulness and curiosity naturally alternates with self-consciousness, judgement, and body fatigue, as well as plenty of ennui.

### III.3 MODEL ROBOTICIST

“Of course you feel that way,” my mindfulness coach would regularly remind me, as I stood watch on the Widow’s Walk atop my uncle’s house in Nantucket, eyes watching the marine horizon. She taught me

---

<sup>6</sup>I used to regularly attend Tuesday night salsa lessons as well.

<sup>7</sup>Then they typically turn around and walk away, ignoring me for the rest of the night. {Okay, actually, that only happened one time, but it is a great topic example.}

<sup>8</sup>Learning from human expressivity experts was helpful in enabling simple robots to communicate more flexibly via a channel they already had.

<sup>9</sup>Soft gaze on the others, occasionally borrowing moves, listening/responding.

to validate the feelings I initially tried to reject or overindulge in.<sup>10</sup> There is the reaction that one initially has, e.g., ‘I don’t want that,’ ‘I really really want that,’ and then the reaction one has to that reaction – like, ‘Ugh, how could I feel that way?,’ or judging, ‘This is so great/awful.’

The reaction to the reaction is called the *second arrow*, and it is there that mindfulness can intervene to reduce suffering over the long term. What feelings am I feeling? Greetings; you are welcome here; I acknowledge your existence. What were the contexts and conditions that co-occurred with this feeling? Of course you are here.<sup>11</sup> Compassionate acceptance is a process that shines sunlight on our own growth.

I may have stumbled through my last few dance steps, but the measures of music continue to come. It is not that we discard our emotions; quite the opposite – it is about acknowledgement of all their permutations and valences. The clock continues to tick, though my heart will never (and always) recover.<sup>12</sup> The ocean waves welcome tears as kin.

### III. 4 INVESTIGATION

The simpler we are, the more complete we become. Even if one does not feel particularly in touch with one’s innermost emotions, all of us can know when we have an initial reaction to something that is “like it” vs. “don’t like it” vs. “Sorry; I was paying attention to something else, who are you and why am I in this park on such a beautiful day?”<sup>13</sup>

Any focus on periodicity or sound or the moment’s neutrals can center us away from the egoic, like a mother’s heartbeat from inside the womb. Wise heart would have us notice the *pleasant* and let it pass rather than cling, notice the *unpleasant* and allow space rather than avoid, and, perhaps most importantly, begin to notice the preponderance of *neutral*. For example, in not seeking to keep our cake beyond

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<sup>10</sup>I dub this alternating of extremes Duality PWM

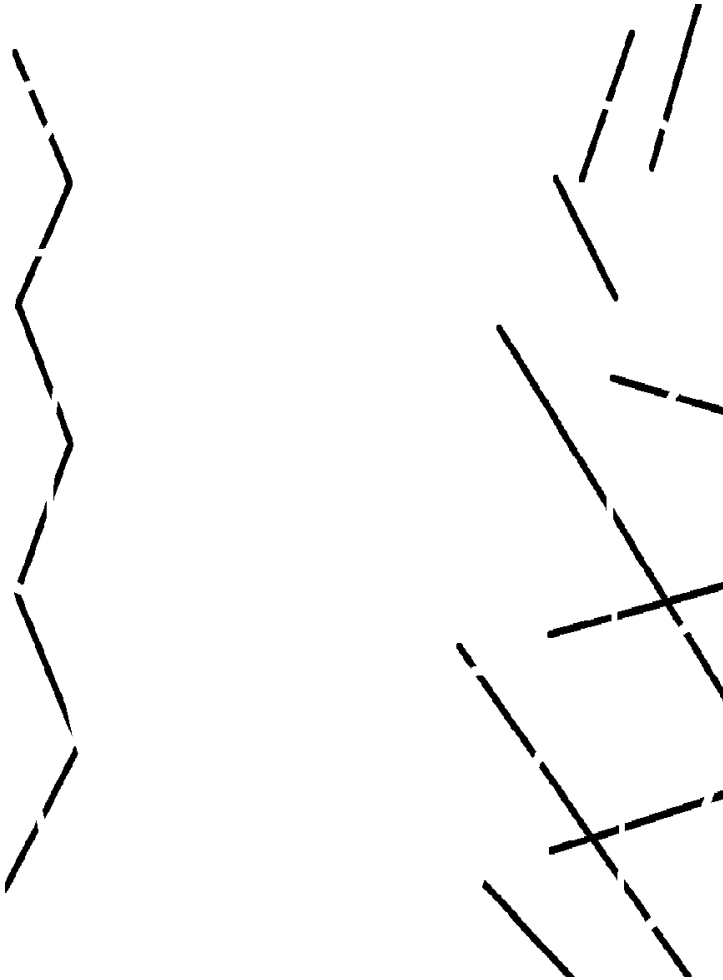
<sup>11</sup>True compassion includes self as well as other.

<sup>12</sup>A loved one is lost to the unpredictable sea. And yet, I dare not give up hope.

<sup>13</sup>it’s almost as if airplanes [and wonder] exist ♥

the now, we can enjoy it. Regarding pain, we will have to tolerate it either way, so might as well give it a chair to sit down. ☺

These processes<sup>14</sup> for handling our pleasant, unpleasant, and neutral reactions are equally applicable to mental processes, as we often respond to and integrate our thoughts emotively.<sup>15</sup>



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<sup>14</sup>(I dare you to mark something in the space above, yep, among those jagged lines)

<sup>15</sup>{are you a person that is afraid of [in love with] creativity like me? let me give you some options to seed your imagination: {write; draw; scribbles};{dance; watch leaves; track phase of the moon as if it were the stock market};{paper; pencil; water-colors{other paints too messy}[make book hard to close][[i sound like Tarzan]]}

# CHAPTER IV

## >> MINDNESS

“L OREM IPSUM DOLOR SIT AMET, CONSECTETUR AD-  
lipiscing elit. Etiam blandit id elit vel mollis. Maecenas vel  
tortor quam. Nullam et turpis ut tellus elementum aliquam. Maecenas  
a sapien pulvinar, malesuada urna suscipit, iaculis mauris. Sed sed  
nunc tincidunt, pretium magna vel, eleifend augue. Fusce vestibulum  
diam sit amet lobortis pharetra. Nullam odio diam, sagittis vel nisi et,  
accumsan elementum libero. Ut sed mauris orci.”<sup>1</sup>

### IV.1 METHODS OF REFLECTION

- It is never too late to have a happy childhood.
- Sometimes what seems and what is real can be quite different.<sup>2</sup>

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“Nor again is there anyone who loves or pursues or desires to obtain pain of  
itself, because it is pain, but because occasionally circumstances occur in which toil  
and pain can procure him some great pleasure. To take a trivial example, which of us  
ever undertakes laborious physical exercise, except to obtain some advantage from it?  
But who has any right to find fault with a man who chooses to enjoy a pleasure that  
has no annoying consequences, or one who avoids a pain that produces no resultant  
pleasure?” {1914 translation by H. Rackham}

<sup>2</sup>As much as I wish things were different, I cannot peer into your head. #abyss

- The pineapple probably could have lived a happy life as a houseplant, were social conventions different.<sup>3</sup> 🍍

How do we think? It is not just via words. The *Lorem Ipsum* text is typically used by designers to lay out the look of a document, establishing a visual plan for graphics and text. This works because the distribution of letters is roughly English-like, from a 45 BC theory of ethics text written in Latin by Cicero. Used for layout by print-makers since the 16th century, such texts are meant to be seen but not comprehended.<sup>4</sup> Now integrated into software such as PageMaker, Lorem Ipsum text blocks were also some of the earliest word generators on the internet, sampled from different passages of the original work,<sup>5</sup> though inappropriate and/or entertaining filler text sneaks in as well.<sup>6</sup>

Sometimes we can extrapolate complex information from simple details. Van Halen was famous for having a line in their band's stage setup instructions about removing all brown M&M's from a bowl. It meant they could walk into a new green room and immediately tell whether it was the kind of venue that would look at every line of the contract. All they had to do was glance at the color distribution in the bowl.

Very occasionally it could occur that such a step was unwittingly overlooked. But that'd be pretty rare.<sup>7</sup>

## IV.2 LIVING ONE'S PRINCIPLES

How do we decide what we do with our days, moments, lives? Is the mind an arbiter or a post-hoc explanation provider, sampling the

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<sup>3</sup>{[So many evolving patterns of living. It's not impossible. Vacuuming curtains.]}

<sup>4</sup>literally anyway, the meaning is stored in a spatial structure that captures the essence of a visual impression

<sup>5</sup>The original title of the treatise is *de Finibus Bonorum et Malorum* (The Extremes of Good and Evil), so choose your Lorem Ipsum sourcewords with care.

<sup>6</sup>Reminds me of PhD students putting heart-wrenching lines into their thesis documents, like '*is anyone actually reading this?*' in the 2nd paragraph of section 7.2.5

<sup>7</sup>like DMing someone 'i love you' and not getting a reply

world's experience though our senses like a split-brain patient, matching the eye's experience to the words we create?

What does it mean to be a witness of our own mental processes? Are the past and future both in flux?<sup>8</sup> Who is it that is asking this question? Is experience mine rather than me vs. you? In contemplating the Four Foundations without entirely disappearing from society, I have found both writing and creating images to be grounding, using digital and paper references of my own thoughts to help track, manage, notice, self-wander, annotate, investigate, collect.

I like the novel-sized journals because they fit in a larger purse, but also fill traditional Composition notebooks with research conversations like a semi-permanent whiteboard. Post-its serve for to-dos, grocery lists, or if I want to go wild and ideate on something that needs structure.<sup>9</sup> Then there are the scribbles I leave in ink by my left thumb like a blackboard I carry with me. The Stickies app on my Macbook serves for high-level goals and organization, as well as quick links. I can archive and create on the Notes and Reminder apps that sync across my laptop and iPhone, also photos, screenshots, reviewed with friends.

How shall I scrapbook the pictures my sons made while in preschool? Sans gluesticks, what is the longevity? Sometimes the imagined occurs – POOF! Usually, but not always, one believes in the possibility first.

### IV.3 A CALL FOR MILITARY BALLGOWNS

Now that we have wandered our way through several abstract concepts,<sup>10</sup> it is time for a story. Life provides us many opportunities to

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<sup>8</sup>“The past, like the future, is indefinite and exists only as a spectrum of possibilities.” – Stephen Hawking (as read in a cafe window last week in Seattle)

<sup>9</sup>I try to limit this indulgence to 2-3 times a year

<sup>10</sup>pain, childhood, visual organization, human dynamics, indicator variables, 1950s housewives, neuroscience, variance, witness, form-based mind supports, planning, estimation of materials, an ability to imagine, the courage to manifest <snap>

put our principles into practice, and so it was after the 9/11 tragedy two weeks into my first year of college. I had recently returned from a summer working in Honduras as a volunteer for the *Amigos de las Americas* program after a year of preparation, including fundraising by selling oranges to extended family and people at church.

Wanting to channel my emotional reaction to the Twin Towers falling into social action, I joined the MIT Air Force ROTC. As an engineer into that whole airplane thing, it seemed like a corps that would use my technical skills, and apparently some of the summer camps involved skydiving. So that first semester away from my family, I ended up donning a military uniform once a week to attend my college classes. It was interesting meeting the other ROTC students. For some reason I had imagined we would discuss the fact that we were being trained to kill people (among other things), or talk strategy and choices of geopolitical influence. Instead, we invested in meta-skills and bonding with each other. Some people, I observed, got engaged very early. ☺

Meanwhile, I had moved into a living group that was 80% international students, some of whom had concerns about the ways in which my country had been bombing theirs. They did not seem interested in hearing about the cool summer camps.

Toward the end of the term, I participated in a military parade through downtown Boston that I consider my first deep meditation. After marching in step with gaze ahead for close to two hours, I melted into the formation, relaxing into the rhythms of our steps with soft-peripheral focus. That night we reconvened for a formal dinner at the Boston Aquarium and were all allowed to bring a date. The male recruits looked dapper in their uniforms, bringing women in party dresses. Perhaps I'd have stuck it out if the Air Force had had lovelier gowns.

#### IV.4 NOTICING THE NEUTRAL

Binary star systems are quite common in the extended universe, I have learned since we last spoke. Of course we pull and influence each other.



Is gravity not a neutral force? That repeatability is something we can rely on.

Left to my own uninterrupted mental devices...

👂 Do you have any life left after breaking my heart?

👂 My hair has gone white.<sup>11</sup> My hope consumed.

👂 We would have made a beautiful baby.<sup>12</sup>

«»THE ORIGIN OF SUFFERING IS SELFISH DESIRE«»

That I could feel these feelings, and that it would be with a person like you. Your words repeat in my head. It is such a deep struggle to accept (admit!) that we do not belong to each other anymore. That whether you meant what you said at the time or not, you are not here now. We got serious so fast. It was demanding to look nice, communicate well, and learn each other's lives. Somehow it became efforting, not connecting. That while I wanted very much for us to work out, I also appreciate the free time.

The odd warnings (in retrospect) about the ex-Mormon friend-of-yours who was only comfortable being intimate if he thought of her as wife material. *It's a Mormon thing*. You know when I said I was all in? *Just kidding. Haha*. Prioritized and anticipated you? *I was playing pretend. Wasn't that just a good time?* 🍰 🍰 🍰 Goodbye cake. You looked superbly delicious earlier tonight. I still care about you quite a lot, and see many of the characteristics I would want in your batter.<sup>13</sup>

«»THE ORIGIN OF SUFFERING IS SELFISH DESIRE«»

Between impetus and response, there is a space.<sup>14</sup>

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<sup>11</sup>you wished for that once, so we would match, do you remember?

<sup>12</sup>Perhaps if we were younger, you said. As a book chronicling trips to the Oregon Coast annotates, *the activities pictured on this sign are fun to do, but it is too dangerous to do them here*. We can control the intention, but not the outcome.

<sup>13</sup>When you taste cake batter, it should be a bit sweeter than what is wanted, as baking will hide some of the sugar from the tongue in a matrix of starch and protein.

<sup>14</sup>Would that we offer each other more than breadsticks and become wise like wolves. 🐺

# CHAPTER V

## >> FORMLESS ✨

ONE OF MY CHILDHOOD GIFTS WAS GROWING UP atop a hill, aside a forest. Still connected, but also separate from society. The long, steep driveway evoked Red Riding Hood, with two dogs and cats awaiting. There was a fireplace in the winter, gardens in the summer, soft carpets and chilly tiles.<sup>1</sup>

When I visited the much less humble Frank Lloyd's Wright's Falling Waters, a cantilevered house whose living room juts over a stream,<sup>2</sup> I felt a similar kinship of nesting domesticity in nature. My own home had been small, but we had two acres for my father's verdant wonderland & patio-side fish pond, water trickling down a natural rock face.

### V.1 EMPTINESS

The soul is nourished by solitude, my new 2023 calendar reads.<sup>3</sup> I am on my 20th day of continuous practice,<sup>4</sup> after spending New Year's Eve at the Zen Center, doing a chime meditation. We rang the chime 108

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<sup>1</sup>wandering around my dark-ceilinged-with-skylights personal monastery, a well-sheltered Mogli; a Hansel and Gretel whose breadcrumbs were not gobbled up.

<sup>2</sup>designed in the 1930s west of Pittsburgh and going incredibly over budget

<sup>3</sup>featuring snow-peaked mountains with alpine lake and azure waters

<sup>4</sup>35 minutes a day, mostly Vipassana meditation, seated on a mat with cushion

times, representing the 108 ways our mind can pull us into suffering. The Space Between.

As some of my fellow practitioners remind me, brains were developed to scan for threats, not seek out co-existence with the universe and inner peace.<sup>5</sup> Spiritual practices are thus called practices, because they require constant tending to, like a garden one waters, fertilizes, weeds, and lets grow. Letting something grow might look like doing nothing, and yet, months later, what delicious vegetables.

Another gift to myself this winter was to re-order a copy of Kip Thorne's *Black Holes & Time Warps*, which I had originally read on a family road trip to the Grand Canyon when I was 12. I hear Brian Greene became popular later,<sup>6</sup> but like the music we grow up with, the breakdown of Newtonian physics to Special Relativity broke open my sense of what might be possible in the universe. Emptiness exists. Time varies close to light speed. Some matter cannot be seen.<sup>7</sup>

## V.2 THE ERRANT MOSQUITO

What do you do when someone – in an otherwise beautiful neighborhood – seeks to bite you?

Shall I slap them away only to see my own blood?

Purchase a head covering to keep the buzzing from reaching my face?  
Wear long sleeves?

Or perhaps just return my attention to what I was doing before.  
What was that again?

---

<sup>5</sup>This is reflected in Samsara, the cycle of birth, misery, death.

<sup>6</sup>string theory and what not

<sup>7</sup>Space.com describes quantum entanglement as: “a bizarre, counterintuitive phenomenon that explains how two subatomic particles can be intimately linked to each other even if separated by billions of light years of space. Despite their vast separation, a change induced in one will affect the other”

Oh, ha. Thanks mosquito. I had forgotten.

## V.3 COMPASSION-CENTRIC DEATH MEDITATION

1: *Sometimes we have to do what we fear to get what we want.*

2: I cling to the past like some people cling to happiness. As if it were a gift that would only come once.

2: Couldn't it have been?

1: *Both/And*<sup>8</sup>

## V.4 WIND, WATER, FOREST



A close friend who burns

down buildings for research said this photo would make a good album cover.<sup>9</sup> Maybe I'll make a Spotify playlist. ✨

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<sup>8</sup>*trust that more love is coming*

<sup>9</sup>i liked this *LaTeX* rendering error, so i kept it. {structural engineer}

## CHAPTER VI

# A NINE-MONTH ARTIST-IN-RESIDENCY IN MYSELF

“**M**AYBE JUST FLIRT AND SEE WHAT HAPPENS.” IS IT possible for a book to write itself? For a person to develop into authenticity? Can we overcome pain and learn from it? Brandishing scars like life-given tattoos that we have *earned*, without requirement for a drunken night, \$45, and a tattoo parlor in Montreal? Comma, and comma, and comma.

### DETERRENCE

I did a style of debate in high school where everything ended in nuclear war. Perhaps it was the collective trauma of the previous generation’s Hiroshima and fluoridated waters.<sup>1</sup>

The style, called Policy Debate, was a bit magical. There were two people on each team. Each round, one team was assigned to advocate

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<sup>1</sup>Dr. Strangelove

for that year's topic;<sup>2</sup> and the other, against it. Everyone was prepared to argue both sides, as we alternated between rounds. The full-day competitions were a bit like basketball tournaments, as the winner of each bracket advanced to the next round. We traveled throughout the American Northeast (sometimes farther) to compete.

We spoke at three to four times normal human speed. Because of the talking speed and strict conventions,<sup>3</sup> the only people qualified to judge our argumentation were former policy debaters, usually vastly old and wise college students. One had to take detailed notes quickly.<sup>4</sup>

We carted around large tubs of evidence, filled with accordion files of heavily categorized, quotable texts photocopied from books and periodicals the summer prior. We also monitored new articles coming out over the course of the year, each of us reviewing a subset of the major periodicals and journals on a weekly basis.<sup>5</sup> Breaking, well-evidenced findings from compelling sources could sometimes sway the judge.

One year, we had a tournament in Chicago that involved taking airplanes.<sup>6</sup> Besides the miniature glass ketchup bottles on the airplane, what I most remember was the Cubs game we attended the day after the tournament, and in particular, *the fear of our college student chaperrone* regarding the fact that most of us high schoolers were leaving the game smelling strongly of alcohol.

---

<sup>2</sup>The US government should substantially improve science education in secondary schools.

<sup>3</sup>any argument the other team made that you didn't address was considered conceded; that was part of the reason people spoke so fast

<sup>4</sup>e.g., THIS -> THAT is a quick way of annotating a central argument without a lot of words, or using shorthand like b/c for 'because' or w/o for 'without' – a skill I still use copiously when taking notes during academic presentations.

<sup>5</sup>photocopying from articles relevant to that year's topic and underlining the most compelling/relevant text, skipping words to streamline the relevant points

<sup>6</sup>SQUEEE! At the time, Southwest flights had metal silverware, white cloth napkins, and miniature glass condiment bottles, even if you were flying coach.

A “fly ball” had led to several of us being soaked by a “fly beer” from a man sitting in front of us.<sup>7</sup>

## IF YOU WEREN'T ALREADY A ROBOTICIST, I WOULDN'T HAVE CAST YOU FOR THIS

When I moved to L.A. after college,<sup>8</sup> I once played a background character in a short film about a young man who was trying to make a robot.

The call had gone out for “people with robots,” as they needed extras (human and robot) to help construct a compelling “robot lab” classroom scene. *Sidenote to Hollywood: Roboticists don't wear lab coats, though we do like old buildings so people don't get mad when we run things into walls.*<sup>9</sup>

I stayed friends with the director for some time after the film, even though the production team told me I looked nothing like a roboticist. Um ... shouldn't the definition of what a roboticist looks like come from the ACTUAL pool of roboticists you are meeting???

Whatever.<sup>10</sup>

## WHAT COULD YOU POSSIBLY NEED?

I once went on a date with a singer in Portland who slept in a basement and had three upstairs roommates.<sup>11</sup>

“You already seem to have everything. What could you possibly need from a boyfriend?”

Companionship. Shared Experiences. Love. Connection.

---

<sup>7</sup>In the end, no one got in trouble, and thus far our world has not exploded, despite the RAND Institute's predictions.

<sup>8</sup>and bought a black Chrysler Sebring convertible with electricity problems that I regularly had to ask strangers to help jump

<sup>9</sup>Sensor failures are normal. Only reason for a lab coat I can think of is using chemicals to construct your own robots, e.g., pouring your own silicone for soft robots, and/or embedding sensors. Bunny suits when sending robots into space.

<sup>10</sup>#stereotypes

<sup>11</sup>Fun fact: We took Grant Imahara out for drinks and dancing once #teardown

## MARIE KONDO

You no longer bring me joy.<sup>20</sup>

### AGGRESSIVE - PASSIVE

He said behaving in a threatening manner was for his own safety.

1) We're all flawed. Many relationships fall apart because one person was not willing to be vulnerable. What's the worst that could happen? At least you took the risk. You found out. You got the answer.

2) Rather than processing the emotional pain & actual issues, it is not unusual to fall to one's coping mechanisms to avoid dealing with the pain. Acting out. Pointing fingers. Cutting the other person down – or *disappearing* – instead of admitting you hurt. One numbs.<sup>21</sup>

## TOBY

You laughed at me for thinking I was descended from actual knights.

This is the one whose laundry I shrunk early in the relationship to avoid future domestic labors.<sup>22</sup>

He showed me homes could be pretty and plants watered.<sup>23</sup>

This was the one that kicked me out of the apartment<sup>24</sup> when the cleaners came, scolding me if I splashed water on a sparkling faucet.

You liked Saturday morning farmers markets and refused to let me cook for you.<sup>25</sup>

## SOMETIMES

you think you're normal

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<sup>20</sup>What we had was special, however ill-fated.

<sup>21</sup>needed to admit my own inner tangles (it's okay to want care!) to let go.

<sup>22</sup>This is a tall tale. And also the truth.

<sup>23</sup>even amid a busy life.

<sup>24</sup>for 2 hours every other Wednesday

<sup>25</sup>I'd too often try recipes I didn't know.



but it turns out you're  
&nbsp; &nbsp; &nbsp; just isolated from society  
&nbsp; &nbsp; &nbsp; and will  
&nbsp; &nbsp; &nbsp; (probably)  
&nbsp; &nbsp; &nbsp; &nbsp; &nbsp; &nbsp; &nbsp; Be Shunned  
&nbsp; &nbsp; &nbsp;

## POETRY

I told my last  
Boyfriend that  
we were like  
Fourier Transforms

One of us saw  
each Frequency through  
all time,  
and the Other  
felt the full set  
of frequencies  
in each Moment.

## PURPLE

when I pulled out the red pain  
you became blue<sup>26</sup>

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<sup>26</sup>split in two  $\lambda$

## CHAPTER VII

### << FORMLESS


“WHEN YOU CALM DOWN, YOU ARE GOING TO BE EMBARRASSED about this.” Hello, narrator. Voice in the sky? In the video you are making of the present moment in your head, where are the {x,y,z} positions of the cameras? What are their field-of-views?<sup>12</sup>

I needed a new way to think about the problem, so on a shared Note across our iPhones, I told you my new favorite color was yellow. When in doubt, transpose everything to a new domain of analysis. [Escape the pattern by splashing cold water on one’s face.] { No one and everyone is watching us here: the essence of digitalia. }

The idea was prompted by a dream in which you had edited the top of our note to say “I miss you” with three emoji white hearts, previewed via push notification banner.<sup>3</sup> Physically proximate but metaphysically distant XOR metaphysically close and physically disparate.

I asked whether you were real. You replied, “Yes. I am.”

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<sup>1</sup>You know your brain is remapping to modern technology when you start dreaming in emojis and phone notifications ... 

<sup>2</sup>Incidentally, have you checked out *Internal Family Systems*? It’s a method for considering the characters in your inner psychology: a centered self, but also the exiles, the firefighters, and the managers. They come out when we think we have something to protect: all the rage for growth-oriented people right now.

<sup>3</sup>*things i wanna with u* – a cloud-enabled love story

## VII.1 FEMININE MASTERY

*The Kali standing on Shiva essentially symbolizes the total mastery of the feminine energy over the process of life. It means you can kill God himself and then give life back to him. That is audacious, isn't it?*<sup>4</sup>



Coming out of Easter, we are now living through the astrophysical experience that is this planet hurling through the solar system on return journey from winter. Rain, sun, snow. Spring contains multitudes.<sup>5</sup>

Sometimes I purchase clothing when I am feeling sad or hopeful, motivated by the magnitude of my emotions, rather than their valence. Found a yin-yang sweater in purple and yellow on SparkleCity.com. If I never see you again, perhaps you will someday read these pages.<sup>6</sup>

Adulthood is a tricky thing. Sometimes capital letters come in handy.

< not always, but *sometimes* – it's helpful to Grow Up >

## VII.2 OPTIONS WE GIVE OURSELVES

*Many many, people will wonder,  
how is it even possible  
that there is even a sense of choice  
to not go into depression  
or despair ... ??  
You had some grace there;  
you could say to yourself  
"that's {wise; **not wise**}.<sup>7</sup>*

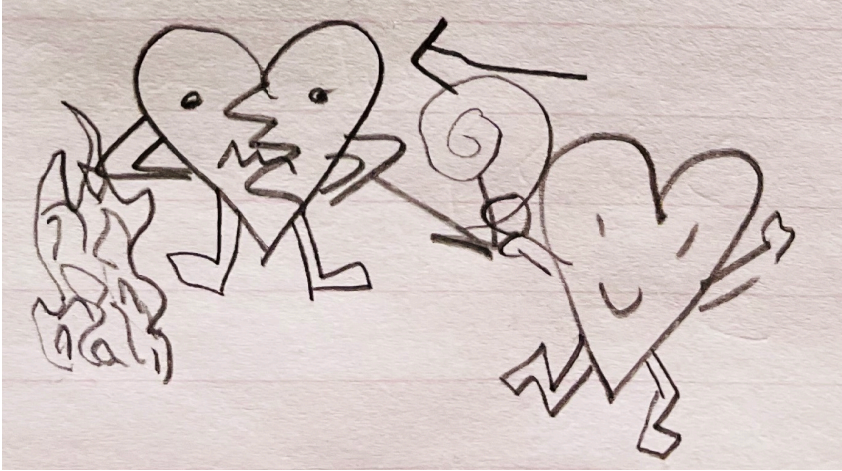
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<sup>4</sup><https://isha.sadhguru.org/mahashivratri/shiva/shiva-kali-the-tantric-symbolism/>, Accessed [4/19/2023] <- anniversary of American Revolution

<sup>5</sup>National Poetry Month coincides with the flowers blooming ( again!! )

<sup>6</sup>in the spirit of chatGPT – introduced to the world since our last digital rites -> the Spotify playlists sometimes grow themselves. { do you notice? }

<sup>7</sup>Tara Brach Podcast (*linebreaks and alternative options added*)



### VII.3 X, Y, THETA ARE NOW OPTIONAL

The story of *The Mustard Seed*<sup>8</sup> illustrates the universality of suffering:

Kisa Gotami had an only son, and he died. In her grief she carried the dead child to all her neighbors ... and the people said... “I cannot give thee medicine for thy child but ... Go to Sakyamuni, the Buddha.” Kisa Gotami repaired to the Buddha and cried: “Lord and Master, give me the medicine that will cure my boy.” The Buddha answered: “I want a handful of mustard seed.” And when the girl in her joy promised to procure it, the Buddha added: “The mustard seed must be taken from a house where no one has lost a child, husband, parent, or friend.”

Poor Kisa Gotami now went from house to house, and the people pitied her and said: “Here is mustard seed; take it!” But when she asked “Did a son or daughter, a father or

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<sup>8</sup>BUDDHA, THE GOSPEL By Paul Carus Chicago, The Open Court Publishing Company, [1894] url: <https://www.sacred-texts.com/bud/btg/btg85.htm>

mother, die in your family?” They answered her: “Alas the living are few, but the dead are many. Do not remind us of our deepest grief.” And there was no house but some beloved one had died in it.

Kisa Gotami became weary and hopeless, and sat down at the wayside, watching the lights of the city, as they flickered up and were extinguished again. At last the darkness of the night reigned everywhere. And she considered the fate of men ... lives flicker up and are extinguished. And she thought to herself: “How selfish am I in my grief! Death is common to all; yet in this valley of desolation there is a path that leads to immortality, for who has surrendered.”<sup>9</sup>

## VII.4 THERE'S NO GROUND

The wound is the way, and there are 84,000 paths<sup>10</sup> to enlightenment.

I think it would be easier for me to write tragedies if I didn't first spell them 'trajedy.' I arrive at my keyboard morose, ready to sink into an emotional tarpit.<sup>11</sup> But if I try to keep a straight face through a scene where my villain says loave instead of loathe, there is no way I will be able to stay in the mood. Alas, I guess I'm stuck with a different genre of literature. One where life \*could\* have meaning.

One where all we have to do is *trust* in the villains that are making technology, or, alternatively, the BUDDHISTS. We are falling, but there's *no ground*. Perhaps not even a we.<sup>12</sup>

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<sup>9</sup><buries child in forest, somehow manages to move forward> As ripe fruits are early in danger of falling, so mortals when born are always in danger of death. As all earthen vessels made by the potter end in being broken.

<sup>10</sup>a.k.a. Dharma doors

<sup>11</sup>after my physical body rots away to a carcass of bones, I aspire to join a future museum and amuse small children, where they can hop up and down on levers to physically experience the viscosity of tar [[La Brea Tarpits]]

<sup>12</sup>(ego) a part-time gig, like quantum foam

## CHAPTER VIII

### << MIND THE GAP

“YOU’RE NOT DOING IT RIGHT IF YOU’RE NOT DYING a little. My first online therapist in Oregon told me to walk in the grass without shoes, and listened listless to my stories of a previous week until he noticed emotional activation ... then he would light up, and ask me to connect memory upon memory upon memory.

Somatic processing: Release the energy trapped in our body. When have you felt like this before? Perhaps we must get lost to be found. Indulge the chaos. Thank you for this opportunity to learn. Invite the inner demons, otherwise, and angels to tea.

#### VIII.1 INTERNAL FAMILY SYSTEMS

I don’t know how to live without my mother, even though I’ve been doing it my whole life.

[2] Sometimes, however, I’ve noticed that I have love for a previous version, e.g., *identity(t - n)*,<sup>1</sup>.

[3] Moving on, is therefore [so fancy], not so much a rejection of the previous {complain, complain, complain} as an acknowledgement of

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<sup>1</sup>what if identity were a time capsule, notching the new layers of bark, a rag-tag set of cherished possessions and ribbons. is there *identity(t + i)*?

the present (no one can pay attention [be alone forever]{where's my phone?}): *identity(t)*. We are all growing and changing all the time.<sup>2</sup>

[1] I'm not sure I've ever fallen out of love with anyone.

I'm sorry ... that I wrote the previous statements out of order. Do you think there's a chance we could ... {[you're a lot]}

## VIII.2 THOUGHT NOTATION SYSTEM

Drawing upon Transactional Analysis<sup>3</sup>... <\*snap>

PRIMARY DEFINITIONS (who):

[*father*]

{*mother*}

(*child*)

DEPTH (to whom):

[*first thought*]

[[*edited for social graces*]]

[[[*inner thoughts/shadow*<sup>4</sup>]]] <- most needs a hug

ADDITIONAL ANNOTATIONS:

<*stage notes / directives / how*>

\*teleportation

For example: I'd like to make some popcorn and watch the next episode of *Full Time Wife Escapest* [the inner dad recording wants to have a beer, just one, and put his feet up] {my inner mom<version:rested> would make popcorn and leave all the dishes in the sink}

**Use on Devices** <————— *so flexible* —————> **Use on Paper**

The early-life (and ongoing) recordings map to the primary definitions [masculine]{feminine}(child), but our adult-centered self is just standard written text, e.g., "I'd like to make some popcorn."<sup>5</sup>

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<sup>2</sup>How could we not?

<sup>3</sup>*I'm Okay, You're Okay*, Avon Book Company, 1973

<sup>4</sup>In the Jungian sense

<sup>5</sup>On it.

After using the annotations myself for four to five months as part of a meditation and journaling practice,<sup>6</sup> I have also noticed overlaps with the [fire-fighters] {managers} (exiles) of Internal Family Systems, and heritages of [yang] {yin} (neutral) energy. The level of analysis and intended audience maps to depth, i.e, the number of times an annotation is repeated at the beginning and end of the labeled clause.

So the innermost mother or manager or startled yin could be found {{{ adrift }}} <- the labels you see to the left. A single annotation is the raw unedited thought; a doubled annotation would be ready to be socially delivered, and a tripled annotation represents text only to shared with oneself or close friends – can include second arrow or anything that might be rejected if heard by the wrong ears.

Then again, the square brackets can sometimes be found offering references or precision [anticipate the reader], the curly braces clarifying context; possibility sets {e.g., criticism/praise}, the centered child adding the might-be-helpfuls, the daydreams, the might-make-you-laugh. Even in our heads there are sunny days. So perhaps there's an additional axis worth considering involving nervous system activation.<sup>7</sup>

### VIII.3 SMART BUT HOT HERMITS

Like parallel parking or The Hermit,<sup>8</sup> sometimes we must go forward to go back; backwards to move forward. These riddles are why relying on Mind alone can lead to madness.

A neuroscientist that can't sleep ... Is this lovely woman actually interested in me? (Are we just playing pretend?)<sup>9</sup> Eyes up, let 'em know you're open. Can't predict the future.

---

<sup>6</sup>it's a bit like a puppet show: you give yourself permission to use funny voices

<sup>7</sup>Also, compound operators are key. Sometimes – when I want to go *wild* – I open a phrase with one bracket, and close it with another. A few months in, I noticed they sometimes agreed with [each other]. Sometimes, {[not always]}. <- even about that

<sup>8</sup>9th card in the Tarot, I recommend the Marseille deck

<sup>9</sup>{not again </3}



## VIII.4 IN THE CLOUD

Hellos, my lost lover. My identity still seems intertwined with your existence and (former){only literally} presence in my life. You don't like reading long treatises, so I'm making this short.<sup>10</sup> "I said I like you, She said that she likes me," *Our Secret, Beat Happening*. It appears that there's something that you offer that I can't find anywhere else. Something irreplaceable.<sup>11</sup>

### **Bluetooth**

What happens when you are out of range of spiritual growth?

Is it analog?  
chopping off the tops and bottoms of sawtooth waves

distortion... sudden limitation in range...

Is it digital?  
clarity percussively ... interspersed ... with quiet()

If you're like me perhaps you get  
An odd sense of the way communications bounce?

around materiality  
and architecture  
in unexpected ways

It's wild that music can pass through the air.

---

<sup>10</sup>Footnoting the sideways wanderings of my busy mind so you {{[anyone]}} can focus on essentials. I hope for you, and yet, and yet, and yet ... You have free will.

If you are looking for me, you are actually mine.

<sup>11</sup>Either we are exchanging secret notes via Spotify playlists – or I am mad. If I pick and choose among the lyrics ... #hallucinations

# CHAPTER IX

## << MADNESS 6

IT'S IRONIC THAT MY FATHER USED TO DESIGN AND model propulsion systems for ships and submarines, because I struggle to move forward.<sup>1</sup> The book *The Four Agreements* suggests we manifest sicknesses by believing stories of our fear. I have a palpable lump over my heart in my left bosom. Tight grips sink ships. My active imagination wants to declare it a symptom of persistent heartbreak.<sup>2</sup>

Step functions can happen at any timestamp. Like a defibrillator.

### IX.1 TIME PRISONERS

“Let the past be the past. Let it not be a headwind that holds us back but a tailwind that pushes us forward.”<sup>3</sup>

We practice meditation and self-compassion much like a runner trains for a race, building up our body’s strength, our tendons’ elasticity, our mental acuity – creating good habits for the moments that arrive where we face challenges.<sup>4</sup> :-/

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<sup>1</sup>My mind is fast, but my heart is slow

<sup>2</sup>Mammogram on Tuesday, but apparently death can wait ... Teaching Observation for my promotion & tenure case today #algorithmic #functions #programming

<sup>3</sup>Imposters S2:E6 37:30; Hello, Me? S1:E1.

<sup>4</sup>I feel early on my path.

## IX.2 WE BEGIN AGAIN

One of the memorable lessons I had in college came when I stayed up all night to write an essay that got accidentally deleted.<sup>5</sup> It sucked. I was exhausted. I was so tired. But there was only one unthinkable option.

I had to write it again. All that time behind me. All that work. It was time to accept that the first draft was gone to the world. That nothing was certain, that I still had to stand back up, flex those tired typing fingers. Uhhhhggggghhh. I had to do it again.

What the emotions resist, the mind must sometimes corral. {I wanted to graduate.} [Sometimes we have to do things even when we're not feeling good.] But when the mind resists, sometimes the only option is to search inside yourself for hope. (((I don't know how.))) Others have done this before, Heather; it is not impossible!

There, up on the fourth floor of the student center in the large shared computer lab, I pulled myself up by the parts of the paper structure I still had in my head, the insights I wanted to cover. And you know what? It was easier the second time. It was different, but it was enough.

It was hard, but it was possible. Like a lost love, I still think of that first draft from time to time. I do not know if I would have given it a second thought if it had not gotten away from me.<sup>6</sup> Sometimes recovery is about being open to possibility. About talking to your fears and your frustrations. About getting up. Wishing y'all fortitude. There is hope.<sup>7</sup>

## IX.3 CONFLICTING WITH REALITY

My parents are here right now, which I appreciate and which presents challenges. For example, I have rarely witnessed words being used to

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<sup>5</sup>Okay, I was showing off my command line prowess like annoying MIT students like to do – athletes of i's and o's, showing off their digitalia.

<sup>6</sup>There is a commonality in humanity's struggles.

<sup>7</sup>This essay is adapted from a personal Facebook post, March 2022

make up after hurt feelings.<sup>8</sup> Maybe that is part of why I specialize in non-verbal communication.<sup>9</sup>

1: It looks like the only night we are all free is Tuesday, want to go out to dinner that night? // 2: That sounds good. // 1: Great. I should be home around 4:30; want to come by? // 2: Okay, we'll see you then.

Tuesday evening arrives. I have walked home because it is a beautiful day. The appointed time comes and goes. My kids are with their dad. Eventually, I learn my mother is on a hike, and says she is at least an hour and a half out – not from coming over, but from the trail head. My text suggesting locales remains unanswered, unacknowledged. My father is at their Airbnb and does not do phones.

Great. My parents stood me up.<sup>10</sup> My therapist was like, “Wowwwww.” She also was happy I was finally talking about my parents. “They really don’t respect you.” :-{

What I have been coming to understand, slowly, slowly,<sup>11</sup> is that learning about patterns is the first step to awareness. The pause between taking everything personally. Perhaps this is how they were treated.

The first *practice* is to befriend the thoughts and feelings that exist. Of course I feel this way. Of course they think that. The second is to bring your attention back to your anchor.<sup>12</sup> Transition from one to the other or rest in place [[like a Hidden Markov Model]].

## IX.4 DEAR JOHN

<“Not everything is about efficiency, Heather.” (I wonder what you were thinking of when you said that)>

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<sup>8</sup>there’s gonna be opposition, no way around it

<sup>9</sup>And have trouble keeping a boyfriend

<sup>10</sup>Dad says he will visit again in 3-4 years

<sup>11</sup>sometimes after hours, days, margaritas, months

<sup>12</sup>Breath that symbolizes life or anything you find grounding – birds singing, rustling leaves, the feeling of clothing on your skin, weight on your seat, warmth radiating from an extended hand.



LIFE CHOICES: I have made some public announcements about my choice to take partial leave this upcoming year and have been thinking since you first wrote about what I feel comfortable sharing with you. My partial leave serves to protect me from excess teaching during this critical pre-promotion period, and is also me taking care of myself.

In my 20s, I used to take about every third year to travel the world or try something new, and I think it has given me a unique and diverse perspective on how people live (I do specialize in human-robot interaction) and the impacts that technological applications might have.

So the contrast of the last decade, with virtually zero free time or mental space in high-stress settings (academia, divorce, solo camping, pandemic),<sup>13</sup> has given my wandering spirit motivation to replenish again.

SCHEDULE: This summer my schedule is campus Mondays, Southtown Tuesdays (our lab moved during the Graf renovation), DaxBot Wednesdays (Philomath), and Zoom Thursdays, with Fridays reserved.

My lab hosted two summer REU students; my grad students will be up in Portland organizing an exhibit at the OMSI's *After Dark* event, and we are currently writing up experiments for the fall deadlines. Next

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<sup>13</sup>Just like computers \*and robots\* benefit from being turned off again, so do thinkers. Perhaps that is why academia has such a deep tradition of sabbatical.

# CHAPTER X

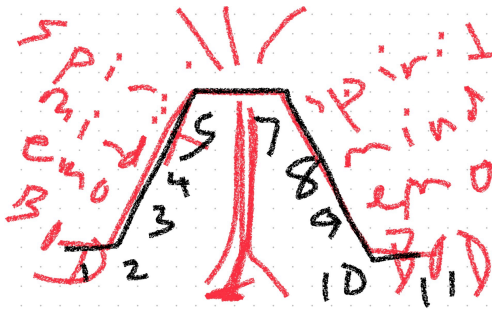
## << ✎ FORM

IN ROMANCE, MEN ARE AFRAID OF BEING LAUGHED AT and women are afraid of being murdered.<sup>1</sup> Physical form and society combine toward varied inner experiences and expectations.

He is bigger than me. I am softer, but sometimes carry a severe expression.<sup>2</sup> Have we learned anything about Dharma and Robots yet?

### X.I PAIN & MISERY

“Mara, I know you.”



<sup>1</sup>rephrase of Margaret Atwood

<sup>2</sup>Twice, Russian men have approached me in parking lots and asked, hopefully, whether I shared their nationality.



Sometimes we are transparent. Sometimes we are mismatched.<sup>3</sup>

In machine learning, as in life, it is at least as helpful to know what you don't want as it is to know what you want. One of my children's recent babysitters, for example, taught them to realize their imaginations via a generative AI art system.<sup>4</sup> The top of the interface specified positive prompts; e.g., elf ears, [[small breasts]], and wings.

The bottom prompts, however, clarified what was to be avoided, from misshapen torso to NSFW. I had never previously thought about babysitters being trained in the ethical use of generative AI art systems before that day, moment, Friday evening, but the sitter made sure to point out the efforts he had put in to ensure a child-safe output.

## X.2 NURTURE IS THE NEW WEALTH

Rumi's advice from the 13th century:<sup>5</sup>

“This is how a human being can change.  
There is a worm  
addicted to eating grape leaves.

Suddenly, he wakes up,  
call it grace, whatever, something

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<sup>3</sup> *Talking to Strangers*, Malcolm Gladwell, 2023.

<sup>4</sup> model: stable-diffusion, model version: meinamix, guidance scale: 21.5, seed: 6139829364336715, enhancer: upscale-anime

<sup>5</sup> Persian poet, scholar, theologian from the 13th century, whose most famous quote is the following: “Do not feel lonely, the entire universe is inside you.”

wakes him, and he is no longer a worm.

He is the entire vineyard,  
and the orchard too, the fruit, the trunks,  
a growing wisdom and joy  
that does not need to devour.”

### X.3 I'M SO GLAD YOU'RE A DANCER

i once dated a man who took a tram the wrong way off the island  
who traced circles through the grocery  
and my dimagination  
like a sailboat  
'is thinking about that helpful?'  
sometimes i hate myself for feeling this way but what can i do?  
his gravity has felt stronger lately<sup>6</sup>  
maybe he just needed some time  
the first thing a couple does is find their balance.

### X.4 THE EIGHT-FOLD PATH

Some of the spiderlegs that help us walk forward, as we use our multi-eyes like kaleidoscopes.

1. *Right understanding* (Samma ditthi);
2. *Right thought* (Samma sankappa);
3. *Right speech* (Samma vaca);
4. *Right action* (Samma kammanta);
5. *Right livelihood* (Samma ajiva);
6. *Right effort* (Samma vayama);
7. *Right mindfulness* (Samma sati);

---

<sup>6</sup>This too is nature ㄩ ㄩ ㄩ



8. *Right concentration* (Samma samadhi).<sup>7</sup>

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<sup>7</sup>Wishing us a peaceful and noble canoe-ride.

I GOTTA GET BACK TO REALITY. WHILE I APPRECIATE the water sprite that helped me tell this tale, lives are for living, and I'm sure you have medical insurance to sell [[kinda related]].

“In order to be able to seek help from the sprites, you’ll need to befriend them first by giving them gifts. Each sprite loves items that are the same color as they are. Mostly this is quite easy to manage since the red sprite likes apples, the orange one oranges, etc. Each sprite also likes grass or other items of their corresponding color and every single one loves flour which you can buy for 50g each in the general store.”<sup>6</sup> in *Story of Seasons: Friends of Mineral Town*.

## THE BUDDHA IN THE ROBOT

The title for this webbook, *Dharma in the Roboticist*, is an homage to a book authored in the 1970s by Japanese Robotics Professor Masahiro Mori called *The Buddha in the Robot*,<sup>7</sup> in which the author uses his perspective as a mechanical engineer to explore and explain Zen Buddhism. Mori also authored the theory of the Uncanny Valley<sup>8</sup> – the idea that robots not living up to humanlike appearances will take a sharp dip into ‘creepy,’ ‘unseemly,’ or ‘jarring. Side effect of dyslexia, perhaps, mediation/meditation look like the same word. ✨💀<sup>9</sup>

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<sup>6</sup>Guide To Nature Sprites <https://www.thegamer.com/story-of-seasons-friends-of-mineral-town-guide-to-nature-sprites/>, Authored: 8/23/2020, Accessed: 5/29/2023

<sup>7</sup>subtitled: A Robot Scientist’s Thoughts on Science and Religion

<sup>8</sup>Mori, Masahiro, Karl F. MacDorman, and Norri Kageki. ”The uncanny valley [from the field].” *IEEE Robotics automation magazine* 19.2 (2012): 98-100.

<sup>9</sup>🌀

# THE DHARMA IN THE ROBOTICIST

by Dr. Heather Knight



About four months into the pandemic, I sprained my right ankle. Having been an active person my whole life, who typically had had trouble sitting down – I assumed I would be able to cross a fallen tree over a stream and impress my seven-year-old son. But, as it turned out, my now sedentary lifestyle had made me vulnerable, and I fell off the tree into the shallow water with a sideways – bam! I was only 37, but my back had started hurting after all the Spring Term zoom sessions, and now I was having trouble walking.

Something needed to change.

As a university professor, we had shifted everything to video-based synchronous instruction and remote meetings in March 2020, where even normal movement is minimized to reduce distraction.

Cover inspired by  
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