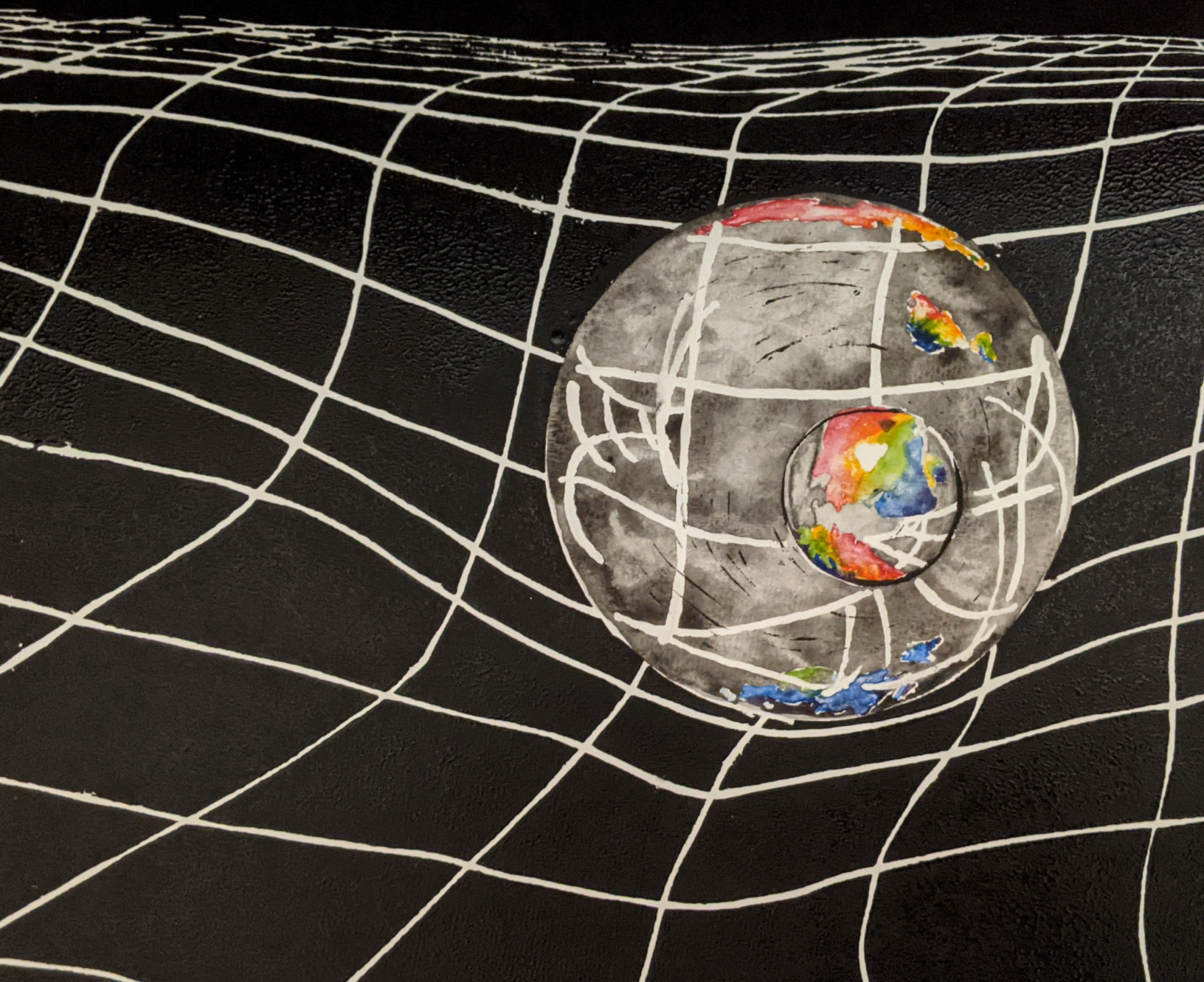
EXPERIENCE IN FIVE DIMENSIONS

A NAVIGATIONAL GUIDE
BY DYLAN BRENNEIS



Experience in Five Dimensions: A Navigational Guide

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1 Introduction

Here I present what I consider to be a useful framework for viewing a person's experience as a sentient, decision-making individual. It is best understood as an analogy to help frame thought, and not a mathematical treatment of fact, or a philosophical argument about the true nature of experience (though it may appear at times to be so). I first describe the landscape: what exactly I mean when I say *experience*, and how one goes about navigating it– considering both the physical body and the non-physical mind. In the second section, I further illustrate the framework by providing examples of how various common experiences can be understood when viewed through this

perspective. Finally, I aim to leverage this framework to provide practical guidance regarding how best to navigate existence.

2 The landscape

2.1 The five dimensions

What we consider our *experience* consists of five distinct parameters. Four will be relatively familiar to most readers: the typical three dimensions of space (x, y, z directions) and the usual fourth dimension: time (t). The fifth is a more abstract concept which I call *universe* (u).

By universe, I mean the particular instantiation of the world that you experience, out of all the possible worlds that could have existed at that point. For example, at the moment deciding a coin-toss, there exist two separate and equally probable universes: one where the flip turns up heads, and another where the flip turns up tails. When I refer to 'universe', I specifically *don't* mean the astronomical concept of the 3D space encompassing everything we know to exist. I use the term in it's more colloquial sense, as it's used in phrases such as: "imagine a universe where we didn't have to worry about money".

I will rely heavily throughout the rest of this document on the imagery created by imagining navigation through this five-dimensional space, so I will spend some time here explaining how I visualize this space.

Since we intuitively understand the three dimensions of space, I can conveniently collapse them down to a single point. For any point where you may exist on a time-universe chart (Figure 1), I assume that your three-dimensional location is known to you. The point in time of your instantaneous experience is described by the location on the horizontal axis, and the universe of your instantaneous experience is shown by the vertical axis.

In this framework, your experience (denoted ξ) can be described as a five-dimensional vector over the reals: $\xi \in \Re^5$: $\xi = (x, y, z, t, u)$. Throughout, I will refer to this five-dimensional structure as *experience space* or ξ *space*. What we think of as the present is wherever your physical body is located right now: in space, time, and universe.

2.2 Body versus mind

There is an important distinction between your body and your mind under this framework. When I refer to your *body*, I refer to the parts of you that are physical, tangible, and made of atoms. This includes the atoms that make

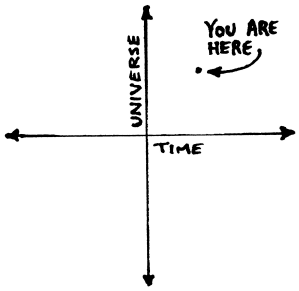

Figure 1: On a universe-time chart, your instantaneous experience is represented by a single point. The point's location describes your experience's time and universe, but does not represent your position in 3D space. Your 3D location is assumed to be known.

up the neurons of your brain. When I refer to your *mind*, I refer to what we commonly think of as mind; your inner self. It is the you that makes you you; the you that makes decisions, and thinks, and feels emotions.

2.2.1 How the mind arises

The mind arises as a natural consequence of the arrangement of your body's neurons, and the experiences you've lived up to this point. It is supported by and exists because of these neurons and the ways that they're connected. A different arrangement would lead to a different mind, and a different you. You will find that your inner self may be very different from the inner self that occupied your physical body several years ago; a brain-scan would also find that the patterns in the connections between your neurons have changed.

2.2.2 How the body affects the mind

The body affects the mind by providing experiences to learn from. The only way that we can interact with the physical world is through our bodies. Additionally, certain physical parts of our experience are able to have direct and uncontrollable effect on our mind. For example, a physical release of the chemical oxytocin can cause our mind to experience emotions related to social bonding.

2.2.3 How the mind affects the body

Your mind affects your body in readily apparent ways: the decisions you make cause your body to move. Your mind can also physically change your body in dramatic ways: choosing to exercise shapes your muscles; choosing to get a tattoo changes your appearance; choosing to put your hand in a blender reduces the number of fingers you have.

Additionally, the thoughts that you have and the emotions you feel can have effects on your body that are not under your mind's control. That is, your unconscious, automatic mind can also have an effect on your physical body. For example, unconscious fight-or-flight stress responses release adrenaline and increase heart rate.

2.2.4 How the mind affects the mind

In order for the mind to affect itself, it needs to act through the medium of the physical body. By thinking, our mind strengthens connections between some neurons, and makes new connections between others. These connections are physical, and are made or broken in 3D space. The alteration in connections gives rise to an incrementally different mind compared to the one that existed previously.

2.2.5 How the body affects the body

Similarly, the body must act through the medium of the mind in order to affect change in itself[1]. Your body may be in need of nutrients, but your mind must make the decision to eat. Anyone who has struggled with weight loss will agree that the difficulty is largely psychological.

2.2.6 How your body moves through ξ space

Your body, being physical, is bound by the laws of physics. This requires that it's movements through ξ space must be continuous in all dimensions (no discontinuities), and must be forward in time. That is, your body's trajectory through ξ space will be described by a function $u = f(t)$.

[1]This is admittedly over-simplified; the body affects itself without intervention of the mind in a number of unconscious, life-preserving ways: healing, digestion, cell-level functions, etc. However, all conscious, choice-driven body-changes-body effects require the mind as part of the process.

2.2.7 How your mind moves through ξ space

Your mind is not bound in physical space, and so is not bound by physics in the same way that your body is. Your mind's trajectory through ξ space may be discontinuous (it can jump around from place to place) and is not even bound to your body's three-dimensional location. It may travel forward or backward in time, and can exist at points in ξ space that your physical body has never experienced.

2.3 Gravity-like forces and their affect on mind-travel

Despite not being bound to physical laws, mind-travel does have particular dynamics that make certain points in ξ space more or less difficult to experience than other points. That is, there are certain thoughts that require more or less mental effort to have than other thoughts.

Imagine the horizontal plane of the (t,u) portion of ξ space as an infinitely large memory-foam mattress (see Figure 2). You can think of your current physical experience as a dense ball travelling along this surface, forward in time along a particular trajectory guided by your decisions. There is a gravity-like force that pulls down perpendicular to the plane, and your trajectory leaves an impression in the surface. The foam restores itself eventually, but it takes some time[2].

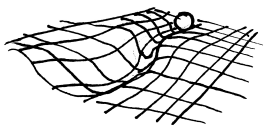

Figure 2: An individual's trajectory through ξ space leaves an impression on the fabric of $(t,\ u)$ space.

When your mind travels through ξ space, it occupies a similar ball, but smaller. Remember also that this ball is able to take discontinuous jumps through ξ space, and can disappear from one location at any instant to reappear in another. The force that pulls the body's ball down into the foam also acts on the mind. Additionally, since the mind arises as the result of physical processes, it's initial position is coincident with the body, and it tends to return near there frequently (Section 2.4).

[2]More properly, it takes some *meta-time* (Section 2.6).

These two points lead to the following observation about the dynamics of mind-travel: it requires the least mental effort for your mind to visit locations near to where it has visited previously, and particularly easy to visit locations where your body has also existed. These are locations where there are already impressions in the foam-surface of ξ space, and the mind ball can roll easily through the existing groove. Moving your mind outside of these experiences requires mental effort to overcome the downward force.

2.4 The well of reaction

The very front leading edge of the body's experience is what we consider to be *now*. In the (t, u) surface, the deepest impression (the point that requires the least mental effort for the mind to exist in) is somewhat behind this leading edge in time (See Figure 3). This location I call the *well of reaction*, and represents the mind unconsciously reacting to the stimulus at hand.

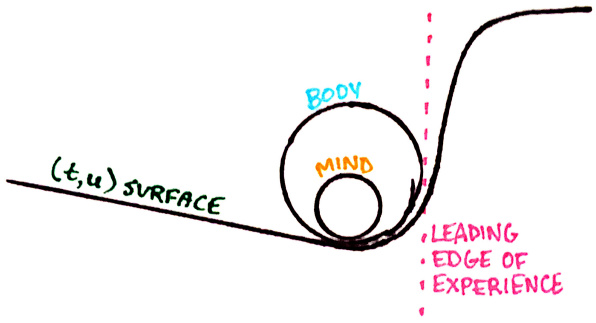

Figure 3: The impression in (t, u) space caused by coincident mind and body spheres. Time extends horizontally across the page in this figure; the universes axis extends perpendicular to the page.

2.5 The variable density of physical experience

The density of the ball of your physical experience can change depending on the needs of your physical existence. In times when your physical body is in need of attention, this ball becomes more dense, drawing the mind back to it. Examples of this are hunger or thirst interrupting a period of *flow*, or the difficulty in contemplating abstract calculus while fleeing a tiger. Conversely, when your body is well cared for and has no immediate needs, the physical

experience ball is less dense (pulls down less on the (t, u) surface), and your mind is free to wander. Examples of this include mind-wandering during a routine drive to work, or dreaming while sleeping.

2.6 Meta-Time and sample rates

In addition to the landscape of ξ space, I will need to introduce a concept I call meta-time[3]. Meta-time is intuitively exactly the same in all regards as the time we are all familiar with. I introduce it as a necessary part of explaining trajectories through ξ space. It has to be different and outside of our usual notions of time, since that is one of our dimensions in ξ space.

Imagine that for every time-step of meta-time, a plotter marks a new point on a (t, u) chart. Over some span of meta-time, there would grow a collection of points, the ordering of which defines the trajectory of a person's experience. Depending on where and how these points are placed on the chart, this trajectory might be in a short or a long span of real-time (the range along the t axis covered by the points).

The points of the body's trajectory through ξ space are equidistant on the t axis; at some sample rate, the body's experience regularly plods along forward in time. As far as the body's experience goes, you can imagine time passing by regularly like paper scrolling across the stylus of an old-fashioned seismograph or lie-detector test.

The points of the mind's trajectory through ξ space do not have any restrictions about where they are plotted with respect to time, but they are plotted at the same regular sample rate with respect to meta-time as those points of the body's ξ trajectory. This is why the mind's perception of time is irregular. This idea is expanded in Section 3.4.

2.7 Travelling across universes

Both your mind and body can travel across universes, though they do so in different ways. Your mind is able to travel to universes in past times that never occurred, and indeed never could have occurred ("what would it have been like to be a passenger on the *Titanic*?"). It can travel to parallel universes at your body's current moment in time ("where would I be now if I hadn't gone to university?"), and to future universes that either

[3]Whenever I reference meta-time throughout this document, I will explicitly use the keyword 'meta-time', for clarity. References to 'time' will always be directed at our intuitive, everyday notion of time.

could exist or would be impossible ("what will happen if I try to go for that promotion?", or "what would a future civilization living on Venus be like?").

Your body travels across universes by interacting with choice points. It can only exist in the real, physical universe that actually exists, and can only move forward in time–but at each moment, you are equipped with choices about what to do, which affect the range of possible universes you may exist within in the future. The physical act of choosing whether to study for the exam or to go to a party represents a real step toward a future universe wherein you may be either successful or not.

There is also a natural topology to the (t, u) space that makes certain universes easier to access than others. This particular topology only affects the movement of the physical body. Moving uphill requires effort; this is why it's more difficult to exercise to move to the universe where you're healthy than it is to lie sedentary and move toward the universe where you're unhealthy. The path of least resistance is the path your experience trajectory takes if you never make a conscious choice for a more difficult action.

Seldom does a single decision have a large effect on your selection of future universes (Section 4.6), because your ball of physical experience has a lot of inertia to overcome, and in general the topology of the (t, u) space isn't very steep. There are sometimes tipping points in your experience however, that make certain future trajectories very easy to get to, and others very difficult (Section 3.13). These are points where the ball of your physical experience is riding along a ridge, where sliding off to either side will result in an irrecoverable tumble.

3 Various common experiences viewed through this lens

In this section, I will use rhetorical phrases such as "because the (t,u) surface eventually restores itself to its former position, mind-travel backward in time requires mental effort" (Section 3.2). By this, I do not mean that some metaphysical (t, u) plane actually has cause-and-effect on our minds or bodies. The true reason distant memories are more vague than recent memories has to do with changes to your brain structures over time. I use these turns of phrase to illustrate how this five-dimensional experience framework can be used to examine and explore the ways that we experience the world. Any insights gained by this mode of thinking should be considered carefully and grounded in other more reliable methods of inquiry such as

empirical science and logical reasoning.

3.1 Sharpness of memory vs vagueness of the future

The dynamics of the (t, u) surface explain why you can remember events that have already happened with relative ease and certainty, whereas projecting forward to predict future events is both more difficult and more uncertain. The difficulty in forward projection is the consequence of travelling uphill to a location where there is no impression in (t, u) space already. Uncertainty in the prediction is due to the fact that choices you and other people make determine the range of possible universes that could be made real. Since with each passing moment more entropy is injected into the set of possible universes, it is easier to predict which possible universe will actually come to pass when you consider near-term projections than long-term projections. There are simply less options.

3.2 Fading memories

Because the (t,u) surface eventually restores itself to its former position, mind-travel backward in time requires mental effort. This means that distant memories are less clear than recent memories (see Sections 3.5 and 3.3 for more on this).

3.3 False memories

My earliest memory is of playing on our stairs with a rubber toy car. In my memory, the stairs are distinctly carpeted. I have been told that this memory is impossible, since we got rid of those rubber cars well before the renovations were done that resulted in the stairs being carpeted (they were originally hardwood during the era of the toy car). Many people similarly report vivid memories of events that could never have occurred. Under this framework, such experiences are explained by the impressions in (t, u) space by mind-visitations of the area. If a universe other than the true lived-experience is visited more regularly than the original, the impression there will be deeper (meaning it's easier for the mind to visit, and can be imagined more vividly). This gives the illusion that the alternate universe is the one of reality, because in most situations easier-to-visit locations in ξ space exist on your travelled trajectory.

3.4 Irregularity in the perception of time

We perceive the forward march of time by checking in with where our body's experience is. Since the body marches forward in time regularly, our mind can experience jumps in time caused by spending significant portions of meta-time outside of the body's experience. For example, when you're deeply absorbed in a film or a book time slips away from you and you look up to realize an hour has gone by that you didn't even notice. When you're anxiously waiting for something, you regularly check in with your body's current experience to see if it has happened yet. This leads to many sample-points of mind-experience in a short span of real-time, which we experience as the elongation of time. Our mind experiences meta-time at a regular pace, so by comparing the number of sample points in the minute leading up to your test results against the number of sample points in a typical minute, the test results minute feels longer (the experience lasts for more meta-time).

3.5 Detailed experiences and jumps in memory

Related to the irregularity of the perception of time (Section 3.4) are hyper-detailed experiences, and gaps in memory. A highly emotional and memorable experience (for example an accident in which a family member is killed) will have many meta-time sample points of mind experience in a relatively brief period of real-time. This makes the impression on the (t, u) surface very deep and therefore easily remembered, with rich clarity offered by the many sample points. These deep impressions may also coincide to periods of high physical-experience density (Section 2.5).

Conversely, your regular drive to work will have very few meta-time sample points of mind experience, because you don't need or want to pay close attention to it (your physical experience ball is not very dense). While your mind is gathering experience elsewhere, your body and unconscious mind go through the regular motions of getting you safely to work. This can leave you with the feeling of having time-travelled once you arrive there and try to remember what happened along the drive.

3.6 The power of story-based media

Telling stories, by whatever media we choose to do so, is a process of taking other peoples' mind experiences on a tour through a particular trajectory. A well-told story that allows you to really empathize with the characters and walk in their shoes essentially allows you the opportunity of adding

experiences to your trajectory that you wouldn't be able to otherwise. It also offers the opportunity to safely provide people with experiences that are valuable to learn from, but harmful to actually experience.

3.7 Abstract thought

Abstract thought, just like any other mind-travel, is simply part of the mind's trajectory through ξ space. I'll use the particular example of mathematical thinking to illustrate how this is done.

Thinking about math doesn't feel like the same thing as imagining a memory or story-line of characters. This is because the alternate universe of mathematics is very far removed from our lived physical experience. This is also why it is a difficult universe to visit. Children learn to travel to this distant universe by first likening concepts to their lived experience. They intuitively grasp whole numbers because they've experienced them in their physical lives as counts of objects. Once they're familiar with navigation in the universe of whole numbers, they can travel from there to the farther-away universe of rational numbers. Building off that navigational knowledge, they can jump to irrational numbers, negative numbers, imaginary numbers, and so on. You can learn to travel to more and more abstract universes by gaining familiarity navigating the less abstract but related universes.

There are other examples also, wherein we use experience in particular universes as jumping-off points for exploring more distant universes. Frequent use of analogies and metaphors in our culture are the ways authors have historically tried to get their audiences to travel to universes the authors care about but the audiences have no experience with.

3.8 Empathy

Empathy can be considered a mental projection into an alternate universe where you experience another person's trajectory rather than your own. In every way, this type of mind-travel is like any other. It's easier to empathize with people with similar experiences to yours (they are closer to the impression of your own trajectory) than it is to empathize with someone who has lived a much different experience.

3.9 Emotions

Emotions are a part of the unconscious mind. That is, emotions are a phenomenon of the mind that it does not control, rather like the body's

knee-jerk reflex response to a physical stimulus. Stimuli for emotional reflexes do not exist in physical space, but rather exist in the mind. Any particular set of physical occurrences will not necessarily generate a particular emotional response; it's the meaning behind those occurrences that matter. For example, breaking a plate could be either no big deal, very sad, or joyous–depending on whether the plate is one of several cheap ones you own, a family heirloom, or part of a Greek celebration. A hammer gives rise to a knee-jerk response; meaning (a non-physical concept) gives rise to emotion.

3.10 Dreaming

Dreaming occurs while you sleep, during which time your body requires no attention from your conscious mind whatsoever. During this period, your physical-experience ball has essentially zero density, allowing your mind to wander freely over alternate universes. These mind trajectories typically range far away from your actual experience, and are only visited once, so the impression in $(t,\ u)$ space is shallow and far away. This makes dreams difficult to remember upon awakening.

3.11 The tendency to return to your physical experience

Our minds return to our physical existence regularly because our physical existence is what supports our minds. The mind cannot exist without neuronal connections, and the neurons are affected by the physical world around them. Distractions like hunger and thirst pull our minds back to our physical presence often. This is why it is difficult to spend more than a few minutes or hours mind-travelling to alternate universes. There is a large amount of mental effort spent in travelling and staying there, because of the topology of the $(t,\ u)$ surface. Your body's recent experience, by comparison, is relatively easy to mind-travel to (see also Sections 2.4 and 3.14).

3.12 Function of future projections and memory

Using mental effort to explore possible future universes is the way that we determine which universe we'd like to exist in, and what steps we need to take in order to get there. In order to be able to accurately predict the effect of events on our trajectory through ξ space, we need to understand the dynamics of similar events. For this, we use memory. Looking back to similar events of the past and their outcomes can give us insights about how

things might turn out in the future, and what actions we need to take in order to navigate toward the universe of our choosing.

3.13 Tipping points

There are occasionally experiences along your physical trajectory that make travelling (physically) to certain possible future universes difficult or impossible. For example, breaking your spine makes it very difficult for your body to traverse to the future universe wherein you pole-vault in the Olympics.

Riding along a ridge of experience space is inherently unstable. These are times when you are faced with a decision where no matter what you choose, you won't be able to change your mind and go back. Depending on what the choice is, you may be able to balance along this ridge without making a decision for quite some time. However, eventually the topology of (t, u) space that you're balancing precariously on will shift underneath you (that is, other factors in the world will affect your ability to make a decision), and you'll fall to one side or the other whether you like it or not. For example, a major life decision many people face is about whether they choose to have biological children. Indecision in this matter practically amounts to the same as "at least not yet". After a long enough period of indecision, the decision will be made by external forces rather than by personal choice, and the outcome of the decision will be no more recoverable than if the choice had been made intentionally. There will either be an accidental pregnancy (after which a decision is time-bound by biological and legal factors) or the aging process will render pregnancy impossible.

Certain daredevil activities could be considered to be riding along an edge of the (t, u) surface that drops off sharply to one side, but is relatively recoverable on the other. In these situations, a person may come close to an irrecoverable change in their lives (or the end), but steer back to other universes just at the last moment. This notion is not restricted to only dangerous activities, where a misstep would lead to negative outcomes. People who routinely self-sabotage tend to flirt with (t, u) gradients that would push them toward more successful outcomes, but steer away again at the last moment. However, since unsuccessful outcomes generally tend to be easier to attain, a self-saboteur is less likely to misstep than a daredevil, and will have an easier time recovering from a misstep should one occur.

3.14 Meditation

Meditation is the practice of maintaining a mind-experience location at the leading edge of the body's experience. Meditation can be quite difficult, and requires much practice and effort to be able to do consistently and for long periods of time.

The difficulty stems from the fact that the period of deepest depression in the (t, u) surface is slightly behind the leading edge of the body's experience: the reactionary position of "what just happened?" (Section 2.4). In meditation, the question is instead "what is happening *now*?".

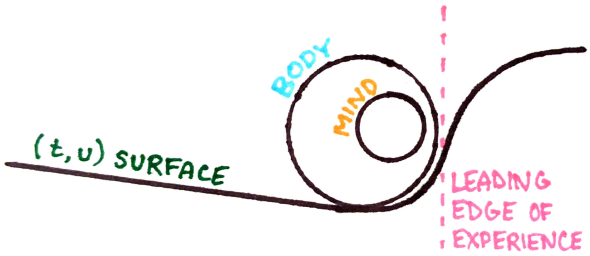

Figure 4: The impression in (t, u) space caused by coincident mind and body spheres during meditation. Time extends horizontally across the page in this figure; the universes axis extends perpendicular to the page.

Riding the leading edge of the physical experience trajectory requires constant effort and attention–very much like the effort required in maintaining a particularly detailed memory, or imagining in exquisite detail some other alternate universe. Not only is the level of mental effort raised, but your side-to-side mental trajectory across universes must match exactly the trajectory of your physical body–and you must do this without jumping forward in time to predict what happens next. All the while, new experiences (distractions) are coming at you, threatening to pull the mind back in time along with them thereby derailing the meditation. The process is very much like trying to stand in position on the nose of a fighter jet, trying to match and follow it's movements while not being blown backward by the wind.

Meditation is a useful practice for two reasons. First, it provides a method of training and strengthening the mind for sustained experience outside the well of reaction, which is useful when trying to explore alternate universes or projecting forward in time. Second, it provides a point of synchronization between mind and body, allowing the mind to better understand the body's needs and capabilities.

3.15 Birth, death, and the mind in between

Under this framework, there are essentially two parts of a person that can be said to exist, and which exist for different spans of time: the mind and the body. The body begins its existence at the moment of conception, and develops and changes dramatically throughout the course of its existence. The mind arises later as a natural result of the arrangement of neurons in the brain, and ceases to exist when the body is no longer able to support it. This may be well before the body dies, clinically speaking. The body ceases to exist some time later, when its assemblage of atoms is well enough dispersed so as to no longer be recognizable as the individual in question.

4 Insights

These insights should be considered in the light of the caveat at the beginning of Section 3. I do not claim that these insights represent any truth about the best or easiest way to accomplish an objective, but only that they may be useful. Considering the observations of previous sections, these appear to me to be reasonable methods worth trying.

4.1 How we learn to mind-travel through ξ space

In our early experience, our ability to mind-travel is underdeveloped. Like all parts of our baby experience, we are weak and only able to travel briefly outside of our previous experience. Our first experiences with mind-travel will be through re-playing memories, as this will be the easiest parts of the (t, u) space to travel to. Eventually we begin casting about short distances into the future ("what will happen if I throw this ball over there?"), using our experience looking through our short memory to try to predict the dynamics. By making predictions that are *incorrect*, we learn something valuable about the world: there are different possible universes in which to travel as well. We start to make decisions, seeing that our choices can have an effect on which path we experience. Following the advent of this ability, we begin to imagine the possibility of alternate universes not just ahead of us, but in all parts of the timeline as well. At this stage, children are hungry for stories, which teach them how to travel across universes in ways they never before knew possible (Section 3.6). Throughout the rest of our lives, we continually develop our mind's ability to travel flexibly through universes by learning new concepts, predicting futures, and reminiscing over old times.

The idea that we can continually strengthen and develop our ability to

mind-travel in five dimensions much like we can exercise to strengthen our ability to move about in three dimensions is empowering. It means that aspects of a person typically thought of as instinctive or unchangeable (such as imagination, empathy, or even clairvoyance) are actually skills that can be honed (Sections 4.2, 4.3, and 4.4).

4.2 Practising imagination

As explained in Section 3.7, we are able to use experience travelling in near universes in order to start to travel to more and more distant or abstract universes. This method can be employed as a means to develop imagination and creativity. The first idea you come up with will likely not be the one that scores you a bestselling novel. However, exploring that idea by spending a significant amount of mental effort and meta-time samples in that region will enable you to see the next possible universe to jump to, which you wouldn't have been able to travel to from your natural experience trajectory. This second universe you visit will also not be your bestselling novel, but it is closer. Through a long series of exploring universes and jumping farther, eventually you fall upon the universe that contains the story-line your readers are also interested in experiencing, and that brings them value because they could not have travelled to that universe without the archaeological artifacts of your expedition.

In this way, creativity and imagination become less of a born-with-genius or inspired-by-muses sort of affair, but one that, by constant application of effort, is in reach of anyone who tries. In fact, many people lauded as creative geniuses are also quoted suggesting that creativity is more a process of perseverance than inspiration.

4.3 Practising empathy

In a similar way to imagination (Section 4.2), empathy can be practised. In this case, the goal is better understanding how to relate to a person. In order to do this, you must mind-travel to their unique experience trajectory. Truly understanding a person requires spending a good amount of time and effort mentally traversing their experience trajectory. The difficulty lies in the fact that their experience trajectory may only overlap yours in a few locations, if at all. Your (t, u) surface where their trajectory exists has no impressions in it that would make following their trajectory easier. For people who exist along trajectories very far from yours, you will likely not be able to mind-travel all the way to their experience in one step. In a

similar process to developing imagination, or learning about a new abstract concept, you will need to take it in steps.

Like imagination, the fact that empathy can be learned and developed is an empowering concept. Feeling unable to support and care for someone you love because you don't understand their experience can devastating. Being able to build up your capacity for empathy over time with constant effort gives hope for a future universe wherein you are able to empathize with that person enough to be able to support their needs.

4.4 Learning clairvoyance

Predicting the future is often said to be impossible. I contend that it is only difficult. It is difficult because the future contains a *lot* of untraveled ξ space, and there are a vast number of possible universes, especially the farther out you project. Your predictions of the future can be made more accurate by careful application of past experience, and a good amount of time travelling through future ξ space.

Chess players frequently will 'look ahead' several moves to project what might happen in the future. Master chess players are likely more often accurate than not. This is a practical example of learned clairvoyance in a particularly structured setting, where external dynamics will have only limited effect on the game dynamics. Most real-world applications for future prediction have much more complex dynamics, and are therefore much more difficult to predict–but the same techniques would apply.

Prediction is simply a matter of travelling carefully forward in time, taking note of all the relevant dynamics to the system you care about, and correctly anticipating what effects they might have on the range of possible future universes. To practice this skill is both a matter of practising the technique (getting better at travelling forward in time, and focusing your mind in order to follow a trajectory faithfully) and of learning which dynamics matter to your prediction and how they affect your system. Learning these dynamics requires careful attention to historical trajectories.

One final note is the importance of eliminating bias from your predictions. Since there will be a lot of dynamics that you don't understand well enough to assess their outcomes, be careful not to tend estimates toward universes you'd like to have exist. Instead, rely on mathematical probabilities when you can, and understand that the farther you project the less certainty your prediction will carry.

4.5 Goal-setting and design

What makes predictions of the future useful is the ability to work toward the futures you would like to see, and away from the ones you'd like to avoid. Goal-setting and design are very similar activities. You can think of design as setting the goal of producing a useful object. I'll run through an example of a product design for illustrative purposes, but goal-setting and following works in much the same way.

Imagine a designer tasked with producing a useful widget. The trajectory their mind will take through ξ space might look something like that shown in Figure 5.

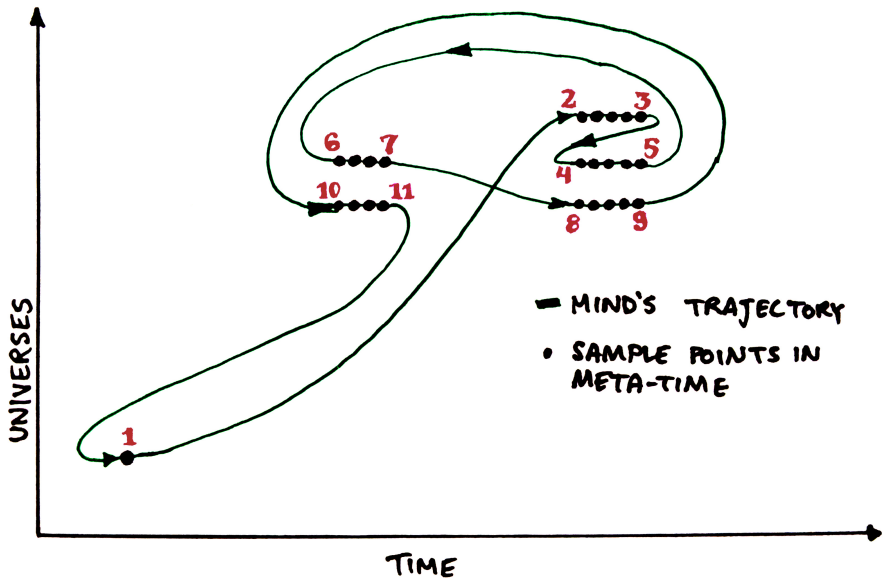

Figure 5: The trajectory a designer's mind might take through ξ space when designing a widget.

With reference to Figure 5, the thought process for the design of a widget might go something like this:

1. The point the designer physically exists in. This is *now*.
2. "What would the widget be like if we made it this way?"
3. "Oh no, that would be bad; people would burn their hand on this hot surface."

4. “What if we added a handle here?”
5. “With that handle, it seems OK.”
6. “If we go with that handle design, what would the manufacturing process be like?”
7. “No, that would be too expensive.”
8. “What if we made the handle out of rubber instead?”
9. “The rubber handle still seems to work.”
10. “Is the manufacturing process still feasible?”
11. “Everything looks OK. Back to (1) to direct the body’s physical motions to move toward universe (9).

We can easily imagine substituting any goal for the desired widget design, and a similar process of looking back from that point to more near-term universes would characterize path-planning toward a goal.

4.5.1 Detailed planning and scattershot planning

Of course, it’s important to remember that the designer or goal planner’s physical body continues to move forward in time while the mind travels through all of this ξ space. This means that if too much meta-time is spent exploring options, some decision-points will have been already passed, making some of the planned trajectories unattainable (Section 3.13). Additionally, the farther out in the future you try to project, the more possible futures there are (Section 4.4), and the more opportunity there is for outside factors to change the space of available universes (Section 4.9). This means there is a trade-off to be made between detailed planning and scattershot planning.

By making a detailed plan, you spend a lot of mental effort putting a particular impression into (t, u) space that you’d like to traverse. When your physical body eventually makes it to the trajectory you’ve imagined, you can traverse it in the direction of your choosing easily, because you’ve already made an impression there (you’ve anticipated future decision points, and already made those choices).

Scattershot planning, by contrast, seeks to make several different impressions in the (t, u) surface at points which represent likely possible futures, taking into account the entropy associated with projecting into the future.

In this way, regardless of the decisions made by the rest of the world, you've anticipated the choice-points that will be presented to you, and have some idea about which choice to make there that will push your trajectory toward the universe of your preference.

Of course, with a scattershot approach you won't have spent as much meta-time exploring the (t, u) surface around any particular choice as you would have with a more detailed plan, so there is a greater chance that things don't turn out as you expect. However, the danger of a detailed plan (that you miss that trajectory altogether and have no recourse) is somewhat mitigated by having anticipated several scenarios.

The most successful form of planning will blend the two methods, relying more heavily on detailed planning when external sources of entropy are at minimum, and relying more on scattershot planning when these are uncertain.

4.5.2 Navigating to vague goals

Sometimes we are faced with more nebulous goals than producing a particular widget. For example, a person's career goal might be to solve artificial intelligence. A goal of that nature is so far in the future as to make the space of possible universes where that goal is realized or not quite vast, and imagining any particular outcome seems as likely as the next. I propose two methods of path-planning for navigating toward such vague goals: a forward-branching approach, and a flag-planting approach.

The forward branching approach involves looking ahead from the present or near-future, and seeing what are the most likely outcomes of each decision. Following the path of each of these likely futures, your mind may or may not arrive at your goal. If it does, you've found a path that you could take to reach it. If not, you back up the decision tree to some choice point, make a different hypothetical decision there, and continue casting forward. This is an iterative process, and it may take many branches of look-ahead before finding a path that leads to your goal.

The flag-planting approach involves first imagining much of the space of your preferred future universe. Upon deciding which future universe you would like to aim for, you plant a flag in (t, u) space there, and begin to imagine backward toward the present. It can be useful for the first pass of planning to take this backward trajectory in just a few hops, keeping your exploration of the space high-level. For example, looking at the vague goal of solving artificial intelligence, you may plant a flag in (t, u) space at the future universe where the AI is beneficial to humanity, and hop back to the

present in a few jumps, finding possibly important milestones along the way such as solving natural language processing. These high-level milestones will be nebulous and vague as well, requiring a similar process of planning to get to them. Eventually, by flitting back and forth between all of these future universes, with each leading into the next and with each pass becoming gradually more detailed, you will have worn a path in the (t, u) surface that represents a path toward your final destination.

4.6 The value of incremental change

Under this framework, it becomes abundantly clear that traversing across universes (especially in the direction of success) is difficult, and requires constant attention and decision making. Keeping your ball of physical experience rolling uphill toward universes of your preference requires constant vigilance in your decision-making that slowly aim your trajectory in the right direction. Small decisions toward the wrong direction are usually quite recoverable, but it's also true that every small good decision is a step in the right direction. Arriving at a far-away universe is almost always the result of a large collection of small decisions; tipping points (Section 3.13) are relatively rare occurrences.

The above is true for both universes you'd like to exist in and universes that you would prefer to avoid. The path to performing at Carnegie Hall is covered with many small decision-points that tended toward practice rather than whatever other choice was available at the time. Each of those decisions individually could have been made in the other direction (and some of them probably were), but in aggregate they have the power to move a person's experience toward that difficult-to attain universe. Similarly, a burned-out drug addict's trajectory will be covered with equally small and inconsequential decision points, that in aggregate move a person's physical experience toward an increasingly bleak universe.

There is another way to look at incremental changes that makes lofty goals seem more attainable. If far-away universes are only arrived at by a series of small steps, then there's no need to worry about making the whole trip in one jump or even quickly. Suppose you imagine a universe where you're playing jazz to a sold-out show, but that universe feels unattainable because you don't even know how to read music. No matter; you don't need to know that *now*. All you need to do today to take a small step toward that universe is to sit down at the piano for a while like you've been meaning to but haven't got around to.

4.7 Emotional management through mind-travel

It is possible to change your emotional state through mind-travel. This happens to us naturally whether we choose to experience it or not: travelling to sad memories tends to make us feel sad or bittersweet emotions; imagining happy futures tends to make us feel hopeful. Remember that emotions are the mind-equivalent of physical reflexes (Section 3.9). Emotions are also present when travelling to parallel universes at the same time coordinate as our actual experience. Imagining what life would be like if only you hadn't ran that red light and crashed your car can make your current experience seem bleak by comparison of what could have been. Imagining what life would be like had you never met your spouse can make you grateful that you have.

4.8 The futility of "if-only" thinking

Imagining parallel universes that are at the same time-coordinate as your physical experience has limited utility. These are universes that you cannot travel to, since your physical experience must move forward in time. To think "if only I had studied more in high school, I would be better off now" is futile. More practically, you could imagine a future forward in time where you are similarly better off, and plan what steps you can take now in order to get there (Section 4.5).

4.9 Dealing with events outside your control

Similar to the futility of imagining you had made other decisions (Section 4.8), there is futility in imagining what universe you would be in had somebody else made a different decision. Other people's choice points *do* in fact affect the space of possible universes available to us, and make some more or less easy to travel to. This is true not only for other people's decisions, but external factors outside of our control such as weather or chance events. These factors, being inherently unpredictable, are best modelled as probabilistic influences for the purposes of forward planning.

Imagine a choice point (1) in Figure 6, that might represent for example your ballot cast in an election. You would prefer to move your trajectory toward the universe (A) where your preferred candidate is elected. However, due to the forces of other people's choices, universe (B) becomes reality instead.

Rather than bemoaning the fact that the outcome of your actions didn't produce the universe of your choosing, a more practical course of action

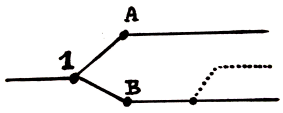

Figure 6: Representation of a choice point leading to two different possible future universes.

would be to imagine future universes that are still reachable from point (B) that have the features you care about from universe (A). From there, you can begin planning what future choices you can make that will move you closer to your preferred outcome, represented by the dotted line in the figure.

Reviewing points along your trajectory where the choice you made didn't bring you closer to the universe you were aiming for can be very useful. Identifying the reason for the misstep can help you to better anticipate how to navigate similar choice-points in the future.

4.10 Impossible futures

There are some universes that are imaginable, but simply inaccessible because your physical ball of experience can only move so quickly from your current universe. Additionally, steep topologies in the (t, u) surface make some futures as inaccessible to your physical experience as your past is. For example, if you're over eighty years old you could imagine a future where you become an astronaut and walk on the moon, but the dynamics of travel across (t, u) space make this traversal so difficult as to be essentially impossible.

It's worthwhile considering whether the future universe you're aiming for is in fact attainable. If not, consider the features of that universe that are most meaningful and important to you, and look for a more attainable universe that has most or all of those features.

5 Limitations

5.1 Meaning and purpose

This framework outlines only the topology and dynamics of ξ space, and makes no statement about the purpose or meaning of existence, should there be one. I make reference to the fact that preferable universes tend to be

more difficult to travel to than less preferable universes, but the motivation behind these preferences lies outside of the scope of this framework.

5.2 The origins of existence

I also make no claim under this framework about the origins of existence in general. An individual's existence has a clear beginning and end, and is brought about and terminated as a result of other people's choices and other environment dynamics. The origins of existence in general is another matter, and is not treated here.

6 Conclusion

In summary, I present a means of thinking about existence that is both intuitive and practically useful. Considering possible future universes under this framework, we can begin to think about how best to navigate toward the universe of our choosing. To navigate successfully, we do not discount the difficulties that will arise (unpredictability of other people's choices, for example), but instead plan for them, empowered by the idea that many small steps will eventually get us where we want to be.