Layers of the Stickening

Layers:

• current carrying wires

• coils

• high voltage wires

• vacuum/gas plumbing

• fluid plumbing with scale up and down

• magnets

• mechanical oscillators

• wheels and belts

• analog signal lines

• computation

• communications

• skeletron

• wire coils

• current connectors

• voltage connectors

• signal connectors

• gas and vacuum connectors

• fluid connectors

Trash Wizardry: The Stickening

Trash wizard multi tool

I want the trash wizard multi tool to be able to measure inductance easily. How to do that? I want the L/R time of something to be long enough to see something on the arduino ADC. But what R? If L is 0.001 H and R is 1 ohm, L/R is 1 ms. Perhaps a 1 ohm shunt resistor somewhere.

Or maybe I want to measure the reverse EMF from changing the current quickly through the coil. V = L dI/dT. For a 1k series resistor driven by 3 V we have 3 mA of current. If that can turn off or on in a few microseconds, it should be possible to induce a good fraction of a volt. But given that the sign will reverse, having this go to ground would be a problem for the ADCs on the arduino. So what I want is a 500 ohm resistor going from the DAC to a node between two 500 ohm resistors in series making a voltage divider between 0 V and 3.3 V. that middle node then goes to the ADC and pulses should be visible. This I will not proceed to build and test.

Currency Diagrams

This will be pictures not words.

This is now how I see “the system”. A circle of debt and power links all people with business and finance to be deployed as needed to support the military industrial complex. I no longer believe in the words “money” or “government”. These are both fictions. There is only debt, power, and the military industrial complex. All of this exists to use fire to turn earth into debt and power and complete the cycle. Denominating that debt by numbers which have power unto themselves without the whole cycle is a unspoken State Religion adopted by all modern states and corporations.

This is what value should look like:

People do labor using industrial “waste” of the old system until it’s all cycled through the new system, using ambient energy which comes originally from the sun, and the living ecosystem that is supported by and supports that cycle in circles of value. Circles can be formed large and small, and involve trust between members of the circle which is initially fixed and which has a finite lifetime. Circles can have any of many different possible rules and structures, can live for a long time or very briefly, etc. They might have as part of their interior various physical artifacts or not, or various mathematical artifacts or not.

Circles may intersect in nodes which can have their own sets of rules. The level of complexity of the infinitely expanding system of value circles and nodes and networks has no serious theoretical limit. I imagine that the amount of data required to denote a value circle is always going to be small, even with some fairly verbose ASCII formatted text about background, stories and rules etc. Media might be needed which could take up a lot more space, but that should all be linked to from the core value circle object.

Creation of Value

Suppose I have a motor I have built, and you have need for a motor. Suppose I have built 1000 motors so I can easily spare a couple for your robot. You need a robot, I can give you a robot, so of course I give you a robot. Together, we have created value in the world in this transaction because you having a robot and me having 999 robots is much more useful than me having 1000 robots and you having zero robots. MUCH more!

Right now we have two choices: we can just call it a gift, hand you the robot, and I can feel like a nice guy. Or I can demand some “money” for it, after which we say I “sold” the robot to you. I put scare quotes around these words, as I often do, to denote that I’m about to reject the assumptions of these terms.

When people say “money” they mean debt from the Federal reserve bank, or some other central bank. That debt has value because it is backed by the military might of the United States, which accepts that debt in its collection of taxes. But this is fucked. Why should we need debt from some military backed bank in order to do this clearly positive transaction? Surely just doing this adds value to society and we should be able to denote that without federal reserve debt. But there is not necessarily any motivation for anyone to make that possible.

So what is the alternative? It seems that the most common alternative is the Marx-influenced concept of the time dollar. A local currency can be created based on hours of labor which can be exchanged through a community without any government involvement, taxes, or any banks. But that is of no help for our robot transaction. My robots were built by robots and took no labor. When you get the robot, it will do labor so you don’t have to. By carrying out a transaction that saves labor, we’re decreasing the value available in the system according to Marxian labor theory of value. Anything that makes life easier creates deflation in a labor based currency, which users of federal reserve debt can attest to the horror of.

I propose that a usable way to communicate value outside of bank debt will involve the ability of people carrying out a transaction to simply create a marker of the value they mutually created. I also propose that fancy math will not be the basis of this. Especially fancy math backed by faith in libertarian neck beard fucks(you know what currency I’m talking about). It will be based on trust. Trust of the people involved in the transaction, which moves like a bubble through the untrusted mass of society.

I propose that one way to do this is for a transaction to be a chapter in a story, and that that story caries the value. So it works like this: I give you a robot. We write a very short story about this, why we did it why it was a good idea, why the robot is cool, etc. Short, to the point, with some details. Now, I can take this story down to the coffee shop and say “hey, man, can I have some coffee, I gave someone a robot today!” They say “yeah, you can have coffee here for the next week or so for a robot, sure. That’s the next chapter of the story. They pass that along to their milk supplier, who adds another chapter and sends it to the fence post company, who takes the longer story to an affiliate coop out in the country who is part of our network, who delivers a much more substantial wood processing robot machine. A real monster. And so on.

It’s not a fully formed system, but I don’t think a good system ever really will be. It’s worth a try, better than nothing, better than federal reserve debt.

More on Value Circles

Another element of the value circle currency concepts is myths. Myths, legends, narratives, call it what you want. One way to create shared trust between members of a value circle is to have shared culture, or folklore.

Do people believe these to be actually true? Maybe. Maybe it doesn’t matter. My view is that existing money already has a weird religious belief built in of the most dangerous possible kind: that which people don’t even acknowledge IS a belief. The entire world view created by the monetary system where everyone has to exchange central bank debt is not related to physical, social, or biological reality. It’s a artificial creation which harms most of the people who without having a choice or even understanding that they made the choice are forced to live their lives by it.

One way to combat what is essentially a very conservative religion is to form a belief system outside it, making the transition from the money belief system to a new one more explicit than just “losing faith” in money which does not force the concept of money to be treated as a religion.

What would be an example? I think initially they would tend to fall into two categories: fan fiction and religion. One of the easiest ways to build a mythology of a value circle is to do something like base things off of Star Wars or Supernatural or something. It helps when people know a thing well enough to have a shared reference easily right from the start. For people who already have some sort of religion, building a trust network based on that both formally and informally is an obvious way to get started. Of course other values would be shared by a value circle, including technically specific elements like “meters of 24 AWG copper magnet wire”, but on top of the specific parts, I believe having something less quantitative and more personal is useful. More on this later, this ongoing stack of aspects to the Value Circle.

On Money and Additive Value

I hate money, and also love it, and that is typical of people in our civilization. I’ve thought a lot about all that over the last year of my total personal disillusionment with capitalism. I’m definitely against most of how our “economy” works, and definitely in favor of something else, but it’s hard to even know where to start with all that.

One habit I’ve acquired over the last few months of reading and thinking about anti-capitalism is replacing the word “money” in my mind with “federal reserve debt”. That’s literally what it is, and constantly reminding myself of that helps me to think clearly about the world around me and what to do about it.

One thing that I hate about money that I want to raise here is that it is dissipative. When a transaction occurs, one party transfers their federal reserve debt to another in exchange for some more real good or service. That transfer has all kinds of losses in it. First of all, in the money system the most value that can possibly exist after the transaction is the amount you started with. Until another party is brought in, in a single transaction, the amount of federal reserve debt always goes down, just as the amount of entropy always goes up in chemistry.

Looking at a system like this it’s clear that the best way to accumulate federal reserve debt is to be the dissipation. One way to do this is literally to take something from the transaction, which is what paypal and banks and credit cards and the rest of the finance industry do. Another is to make money off taxes, as the military industrial complex does. And a third is to be a middle man in the information channel from seller to buyer, by being in the advertising/marketing industry. And indeed I argue that these three types of accumulation are the main power lines in our society: military, finance and marketing. Plenty of power and wealth accumulators are all three or some combination, but I argue that most power in our society is based on these three pillars because they are the optimal means to accumulate federal reserve debt. Everything else loses to these dissipations and eventually feeds someone in one of these three pillars more than your little project possibly ever can accumulate.

It is not so much my goal here to attack the concept of central bank debt, taxes, etc. as to think about how to get outside this to add and exchange value without that system. What I argue is that a transaction should add a note of value to both sides, not just one, and that it should require no value on a balance sheet before the transaction. This second part is extremely critical. One of the crippling problems of our current system is that it prevents anyone from being self sufficient, ever. If some group wants to exchange goods and services in a

closed economy they need to first get federal reserve debt from the outside in order to even have units of currency with which to work. Add dissipation to that, and eventually they'll always be more and more dependent over time on the outside world, and be forced to participate in global capitalism. A system that addresses these problems must allow parties to agree to do a thing, do it, and create from nothing the value that can be further passed along to the rest of society. Another critical flaw in the money system is the negative value of work. We assume that in any work transaction there is a winner and a loser. E.g. at a gym everyone has to either pay or get paid, it's assumed that the coaches are losing something and the athletes are gaining, so they are on opposite sides of a neutral or net-negative(with rent and taxes etc) transaction. But surely the coaches also gain? Are they not also athletes? And the athletes are working just as hard, why is their work somehow "opposite"?

All this is cleared up by the additive currency concept. Here a transaction creates a value pair, with half taken by each party. Thus when a personal trainer meets with an athlete, they each walk away with a unit of value equal to one times the value of that transaction. Let's now go back to my motor factory supply chain. An urban scavenger rolls up on their bike with a big bin of copper wire, and we each record that that was of value and changed hands. They then take that value token to the local coffee shop who pours them coffee and both sides get the coffee transaction token. The coffee shop buys a coffee grinding machine using one of our motors from one of our customer factories, more tokens are generated on both sides. The coffee shop takes this new hoard of tokens and pays their workers, and this payment also generates value on both sides, further accumulating the wealth of the coffee shop who is a major pillar in all this. The grinder factory trades with us for motors in bulk, and some bulk material transaction value is again created on both sides of the sheet.

There is a strong analogy between this system and the so-called h-index used in academia. The h index is designed to create a measure of the success of an academic career based on the combination of two factors: how many times has someone published and how much are those publications cited. The idea is to avoid valuing either the one paper that gets 1000 citations or the author who publishes 100 papers a year none of which are ever read. Authors who both publish often and get frequently cited are, on average, going to be the biggest contributors to value in the field. For better or worse, h-index ends up having real value that can get turned into federal reserve debt by having an impact on hiring and promotions of academics. It's not a perfect system by any means and is widely abused by departments but I think it's an interesting proof of principle that this idea can be useful.

A missing part of all this is a proposed implementation strategy. How should the value be accounted for? I could think of a lot of ways to do it but I want to make the point that I think this is much less important and difficult than a lot of techno nerds want you to believe. Any store of value, whether it's paypal, cash, or credit card debt is basically based on trust. Sure, there are anti-counterfeiting measures on bills and encryption on online transactions. But for the most part these systems work because most people can be trusted most of the time. If everyone really were out to steal and cheat, encryption would be nowhere near enough to save it, and it would collapse instantly. All this works because the VAST majority of people would rather do something useful than go into the illegal bill printing business or credit card theft. One way I think it could be done is with an archive of stories. Some kind of shared electronic narrative that includes all the transactions in the network. This is not great for doing illegal shit or avoiding government surveillance, and that is a problem in some ways. But not in the long run because it forces people to push back against the government controls a lot harder and faster and also because that stuff can always still happen with federal reserve debt, alternate and more anonymous systems, etc. Clearly there will be others for whom this doesn't work. But I believe that a story-database-based system of value can work for some people. And if it works for *anyone* it's instantly extremely

powerful because it will grow exponentially and naturally find the people who can benefit from it most. Is it taxable? Probably not. If we do things “for free” meaning no federal reserve debt is exchanged at all, what is there to tax? Surely not vast, unencrypted databases of anecdotes and poems describing the actions of millions of people.

And it’s not even really necessarily a threat to the government tax system, I think. Part of how our system is as broken as it is is how differently it serves those who control the pillars of power from the rest of us. The fact is that the capitalist overlords, governments, military machines etc. don’t really need the vast majority of us to exist. Our demands for food, medical care, housing etc. are mostly an inconvenience to them. An economy like this might take what looks like potential tax revenue out of the system, but it also takes an incredibly vast load of social welfare spending off of the existing system, since that kind of value is so much better created in the additive value system.

One more point is that I don’t consider bitcoin to be in any way relevant to fixing the money system. With any form of currency, you have to ask “who do I trust when I place trust in this?” I have lots of criticisms of the central banks, and the federal reserve in particular. But given the choice between central bankers and some neck beard fedora software montherfuckers, I’ll take the central bankers any day of the week. Because the demographic in charge of bitcoin is, in my view, the single least trustworthy group that exists in our society. Also, building deflation into a currency is so bizarrely pathological it’s not even worth looking at. Bitcoin isn’t money, neck beards are not revolutionaries, it’s time to move on.

So where do we start? I think I want to build a supply chain out of trash, and then just try the database of stories method and see what happens. Having a supply chain that is clearly of value will give me the leverage to start a thing like this. So probably another year or two are required, and hopefully by then I’ll be more comfortable with python and will be able to build a prototype software system to start this off.

kook industry

I think I have decided I want to join the kook industry. I have noticed that on Amazon there are people selling e-books for 0.99 cents about the end of the world, nuclear war, all sorts of crazy stuff. Then there are you tube people who make a living doing really dangerous things with electricity. And professional trolls who somehow get food and shelter from strangers all over the internet in support of their asshole online persona. I don’t want to be any of these specifically. I don’t want to sell an e-book about the end of the world, be an asshole for money, or court death with high voltage youtube experiments.

But I do think I’m realizing that I can’t function, or rather refuse to function, in normal society and that this makes me a member of the kook industry. I’m seeing this whole world more and more. Years ago I had a job with a friend delivering furniture. It was a super fun summer, although I was glad to stop when it was over. But one thing I realized was that there was a whole world of pairs of guys who drive around. Delivery guys, maintenance guys, cops, pool cleaners, and a range of other jobs that are usually done by two guys who often have time to stop at the same dunk n donuts. Many jobs, but one world.

And I think the kook industry is similar. Some are college professors, others are called artists, others are called activists, others bloggers, but fundamentally what people in the kook industry do is similar. The kook industry produces media content of various kinds that people can consume to get ideas outside the mainstream.

So now I think I've defined my problem. I'm not going to get a job, I'm not going to sell stuff. Or not useful stuff. I'm going to distribute weird information and get paid by patrons. That patron might be a consulting client, people buying weird shit online they don't need, youtube fans… who knows. But that's the goal. What i want to do for society that I actually get compensated for is create very odd ideas that cause change in the world. In a post apocalyptic society I'll point out eccentric and useful ways to move water around or something.

The next step here is to build a media presence for my lab with the technical goals spelled out and a clear channel to produce content that people want and also that can get people involved to build out the post capitalist infrastructure so this can grow beyond money. I want the financial scale of the project to be very modest, to not have a for profit or non profit corporation, just me and whatever other weirdos I can recruit to this corner of the kook industry.

Now for a manifesto and a place to put it, onward!

Free Feed of the Value Circles

People love their feeds. Facebook, Twitter, Yammer, news feeds, tumblr feeds, text message feeds, push notification feeds. It has proven to be a very widely liked format for a person to see the passage of time of a community of people. Value circles should include this feed concept. Working on your stuff will add media content from your device which gets added to the main value circle database and then fed into various users' feeds based on their filter choices. I think if you are not trying to make money that this whole thing can be much simpler than the existing software and that Facebook etc can be replaced. However, it's also possible that the best first implementation of this will be to do it in a existing commercial system like Facebook. This is obviously dangerous. Dealing with companies like that can have legal problems, control problems, and limitations on what you can do practically. It's not ideal, but it's something to consider. And the free feed that circulates and shares data to a web browser that can be loaded on the pi zero tablets of the trash wizards is a project that should be worked on immediately. Probably tools already exist that can be adapted for this task. This is worth some detail in the first book, it's not physics, it's code and that's faster to deploy.

Free Phones of the Future

One of the many idiotic things capitalists say to shut up their critics is to point out that capitalism is the source of the smart phones that anti capitalists inevitably use.

These devices are indeed amazing, and are no longer luxury items by any means. On the contrary, they are very much a survival tool used by the oppressed classes now, and it's very dangerous to ignore that role this technology plays. But what aspect of them is so great? The social networking. That's always what you need: access to the web, various messaging systems, and various commercial things like Uber and Lyft.

Does that really need to be a computer? A truly free phone would be a pure communication tool that communicates in a distributed way like fido net of old. the sole purpose of the hardware would be to communicate images, sounds, text, and to decide where those should go. That's it. What the hell do you need a computer for? Mostly so that The Man can spy on you and figure out how to sell you shit you don't need, and force you to constantly throw more federal reserve debt back into the machine for more advanced machines to get more indoctrination to continue the cycle.

It's all bullshit! Don't be fooled by the dominance of the computer technology into believing that's inevitable. It's not. We can get orders of magnitude more benefit from peer to peer networks than we do today as slaves to the military industrial machine if these phones were all free like freedom, linked up on free hardware all the way. This can actually be the basic informational skeleton of the value circles.

I believe that the hardware can be re worked from the ground up based on our approach to applied electromagnetism to get something with totally new fab. But in the mean time, given that that is a lengthy applied physics research project, what can we do? My answer is to watch closely everything that has anything to do with Raspberry Pi and other "internet of things" projects in the open hardware domain. I say "open hardware" here and not free hardware, because it's not free according to my strict definition: it relies on mine-driven fab and capitalism, and there is IP in the supply chain(and some other problems). But it's way better in terms of open and free than the whole android/apple ecosystem.

as seen here:

https://www.adafruit.com/products/2885 (https://www.adafruit.com/products/2885)

The pi zero sells for 5 dollars! And it's free like freedom as far as the software goes, as I understand it. The problem of course is that it's not what you'd call a product still. You need to buy a screen separately, and a battery, and some other odds and ends, and then put a package together, get all the software working, etc. It's not trivial. Not insanely hard, but not trivial and also not really as usable as a apple or android.

But surely this could change? If people want to work within the system of existing "tech" a fantastic place to focus efforts would be making this technology closer to truly free. This will be a combination of figuring out sourcing logistics on the hardware, making the software closer to what a phone user expects, and writing new software to make more free infrastructure that runs on the free hardware. If a truly free platform were to allow for the kind of peer to peer labor and goods sharing that for profit platforms now have, capitalism might just collapse overnight as people spontaneously are able to work and do things by communicating freely.

Don't like the phone but like "tech"? make a free phone. It will happen one way or the other, but the more ways it happens the better for everyone.

How to Build the Team to build the Technology

I'm clearly not going to build all the things I'm describing here. And even the things I do build, I hope to have what I build be a insignificant fraction of the total number of units produced in the future. How to recruit? Who to recruit? Where will they work? I've been contemplating these questions, and I see several ways to proceed.

Largely the various ways forward will involve decisions about where to be on the spectrum of working inside the system vs. outside. Some choices will involve getting very conventional, and I fear they will end up being coopted by the existing system. One of those would be to structure the way ARPA was in ins heyday. Many top academic, corporate, and government research labs could receive targeted funds to work on problems, where the funds come from various donations and military applied science grant money. The work would then be done by the usual suspects: grad students, post docs, and various staff researchers inside the current system. I think the biggest danger here is that the developed technologies will not be free in the real sense because it's so hard for a expensive R&D lab to ever build a thing that's not based on expensive equipment.

Another way forward is to focus on commercial applications in the old economy. One could for instance build a very reliable and cheap water pump, and build a rapidly growing for-profit company on that which funds R&D to free technology through its profits. This is, I think, the worst of all possible choices. Capitalism poisons everything it touches. And I think the way I'm going to define capitalism for the purpose of this work is "the belief that value can be measured using numbers". It's that simple. Any kind of money or equivalent value unit that can be counted is the poison we all know from our capitalist nightmare, and that's what I'm going to focus on purging from the technological supply chain.

At the other end of the spectrum, one imagines seizing a abandoned factory building and building the R&D infrastructure up from scratch in a squat environment. I predict that going too far down this path ends with the usual endless war with cops and landlords that always happens when good people try to use land without the System. Even if you imagine buying the land so that there are no direct legal challenges, cops and landlords will be an ever-present problem, as will generating enough federal reserve debt to keep the bastards off our backs. A lot of time will have to be spent on just keeping the site running.

Seizing land and building up the means of production makes sense when you have a working technology that can be instantly deployed and then also broken down and moved later when you need to move. But before the technology is mature, it makes sense to be completely distributed geographically. Also, for this project to work as I want it too, we need strong cooperation between the developing world and the developed world, and between diverse people living on land that has different types of local resources available from whatever their local trash streams are, as well as the very diverse energy considerations, and the diverse cultural considerations which should be considered early not later.

How does this distributed system work? I believe part of it involves the structure of the actual book document. I don't feel that the Jupiter notebooks are quite where I want them yet, but they're close, and I think that the structure will be based on software that comes out of that basic structure. Users will make modules to solve various technical problems, as well as post new ones, and they'll all be integrated into the combined book. This is, in many ways, what the open source software people do using their git hub bullshit. I think git up is a giant festering piece of shit, however, and loathe most software communities, so this is a tricky game. Somehow the innovations from that world should be used without poisoning the whole project and creating yet another tech bro shit head club.

One way I want to differentiate from a lot of computer software bullshit is by having a coherent narrative. Something that drives me crazy about their culture is that things are so distributed that you can't actually figure out where to start. It's not just that there are forks, it's that there are *many* forks all the time for everything and everyone is a giant dick about all of it. I'm not above simply banning anyone with any tech company affiliations from contributing to the main document.

This is a book. A book is a finite thing. As time goes on content will be added, but other content will also be deleted. It will all be archived, but if someone wants to they can approach from zero, start at the beginning, and have a coherent narrative to follow as they build up to actually having the ability to use the technology themselves. There will be various versions to account for many human languages as well as some various tracks that might exist, but all of the parallel versions and tracks must be self contained and linear(or at least with the option of treating them as linear). I need to keep a very close eye on how things progress with the various jupiter like things out there, because it's moving fast. It all has to work on a free trash wizard stick, but

that should be fine with the HTML5 stuff that everything now runs on inside a browser. Is there a simple way to go back and forth between jupiter notebooks and a fully compiled .pdf in book format? Surely there is, and if not, it should be some combination of existing scripts chained together.

My job as initial author is to create well posed problems in the first draft of the book, and to make it appealing for people to contribute solutions to those problems. This will be extremely hard to get right on a first pass, and part of getting this whole thing to work will involve shifting that format over time. When things are really working, the R&D will be all done in the value circle economy, where people are constantly creating that form of value as they do R&D. This has the potential to be a very hard chicken-and-egg problem: the book needs a lot of work in order to have value circles work, but without value circles people can't work on it effectively. That's why this all starts with me working alone in my underwear at home. And remains that way for a while. Because I need to first have the system working with me as the only user, then me and some close associates, then a few "followers" who just build kits, and then, when that team has worked for a few years, more people can ease their way into the system to grow it. Of course as the serial/parallel global crises of capitalist disaster accelerate, we may find that things grow explosively instead. If that happens it happens, but I will plan for something that is built much more carefully.

This blog post was going to go into a list if the types of experts needed to get the various jobs done, but on looking where it ended up going that looks more and more like a useless exercise at this time. I'll build up the vision of what should get built, build my own parts of that technology and distribute them, and then a sort of chemical potential will form which brings in the right experts. It's dangerous to specify exact professional qualifications too early, as it will end up losing out on some opportunities to bring in talent outside the organized technical professions, which creates lots of biases in class, race, nationality, age, etc. It's much better to pose problems clearly with no jargon, in as many ways as possible and just see who turns up with a solution.

WE COME FROM PLANET JUPYTER AND MEAN YOU NO HARM

Well, it's happened. I've become a raving Jupyter evangelist. This stuff spreads like wild fire. Whether I'm talking to a sex toy engineer, a rare book librarian, or a quantum computing person, I can't stop trying to drag them into the world of Jupyter. IT'S THE BEST FUCKING THING EVER.

http://jupyter.org (http://jupyter.org)

It mixes between LaTeX and a form of python designed to copy the look and feel of matlab but with much better documentation and more complete packages. And there are tools set up for sharing of data and analysis on the web with it.

To me, this is a little peek into the future of the scientific process. Pushing forward into the speculative, I think in the future, you'll take all your data directly to the cloud, where everyone in the community can see it, and analyze it there. Anyone who wants can fork your experiment to their bit of the cloud, analyze it themselves, and link back from your data to their analysis. Your close colleagues will get updates that scroll along in real time like Facebook or twitter, and publishing will be a series of things getting up voted or promoted more heavily. Actual papers structured the old way will be much more pedagogical. With the data and analysis

happening constantly in real time and shared through the community, the only reason to write a full paper is to really help people understand things. A bunch of this involves software that's not quite written yet, but this whole Jupyter notebook thing is a huge leap toward it.

In [ ]: