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Designs on Transcendence: Sketches of a TX Machine

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ABSTRACT

Despite the vast number of people who use technology as a part of their spiritual practice, there is little research on the subject in studies of Human–Computer Interaction (HCI). Although HCI takes the idea of user experience very seriously, the field gives almost no consideration to experiences with technology that might be described as spiritual or transcendent. This monograph reviews the work that HCI has produced in this area, but also draws on related research in psychology, philosophy, sociology, anthropology, digital religion, psychopharmacology, and neuroscience. The literature indicates that transcendent experiences can be facilitated physically (through natural environments, architecture, art, music), chemically (with psychedelic compounds such as psilocybin, LSD, ketamine, and mescaline), and also digitally (in virtual reality, meditation apps, and research prototypes). Many terms recur in the literature on transcendence describing it as — ineffable, intense, ephemeral, paradoxical and sometimes sacred; mystical transcendent experiences are characterized by unity, epiphany, and an altered perception of time and space; common emotional responses

include ecstasy, tranquility, gratitude, awe, and reverence. Such experiences are similar across religious and cultural backgrounds but interpretations vary according to world view. Studies record benefits of transcendent experiences, such as substance use recovery and improved mental health. We explore the themes in the literature through an illustrated design fiction depicting a near-future conference on transcendent experience (TX) research. This is an extended and illustrated speculation around brain-computer interfaces that might evoke transcendent experiences. The monograph ends with a manifesto calling for a radically interdisciplinary field that would bridge cultural divides and move beyond models of health and well-being to establish new forums and venues for TX research.

1

Introduction: Mood Altering Technologies

You are sitting on a bench in the ruins of a temple; the sky above you is full of shooting stars. As you inhale, blue particles of light rush toward you; when you exhale, red particles flow away. You float into a tunnel of blue light above you and ascend into darkness. The scene fades up onto a quiet wood where a lamp post illuminates flakes of slowly falling snow. A circle appears in the air; you breathe in, hold the breath, exhale and rest at each quarter turn of the circle. A rising tone accompanies each in-breath, there is silence for the hold and the tone descends on the out-breath. A soothing voice explains that this "box breathing" is a technique used by Navy Seals. When you are ready, you look into a light and float up into the tunnel above you. This time it leads out into space and you are floating above a vast planet with clouds moving over land masses and oceans. To one side, you see the dark side of a moon and beyond it, a sun blazes through the darkness. Behind you are multi-colored star fields. Long, soothing chords move through subtle modulations as you look down on the peaceful planet.

> *A scale appears from the darkness and asks you to rate your mood from one to ten.*

This is one of the virtual reality (VR) experiences available on TRIPP, an app designed to support meditation through VR headsets. TRIPP builds on existing academic research on awe, the psychological effects of color and sound as well as studies of meditation and its impact on mental health (TRIPP, 2021). The environments presented during the VR experiences vary depending on user settings and progress. Users find themselves floating through environments that look like gigantic electronic circuits, or brain synapses or fields of psilocybin mushrooms. The branding of the company (including the name) explicitly references the art and argot of 1960s psychedelia. This is perhaps unsurprising given the aim of providing mood-altering digital experiences.

At the same time, there have been significant developments in research on psychedelics, and popular podcasters like Joe Rogan and Sam Harris regularly speak about the potential benefits of these drugs for mental health. There have been studies on the use of psilocybin in the treatment of depression and ketamine for the treatment of alcoholism and other addictions (Jones, 2021). Until very recently the use of such drugs has been limited to experimental studies but in 2021 the clinical bio-tech company Awakn Life Sciences opened a clinic in Bristol, UK, that will deliver "Ketamine-assisted psychotherapy" to self-referring patients; the company aims to open 15–20 clinics across the UK and the EU in the next 24 months and investment capital is following what has been described as a "psychedelics gold rush" (Jones, 2021). The global wellness economy is estimated at some USD \$4.2 trillion (Global Wellness Institute, 2018) so change is likely to happen fast.

In the last century, there was a widespread belief that there might be a chemical means of opening what Aldous Huxley described as "the doors of perception" (Huxley, 1954). Today there is a similar idea that the doors of perception may be unlocked digitally. Elon Musk recently live-streamed a demonstration of Neuralink describing the system he envisages as something like a Fitbit$^{®}$ in the brain working in tandem with a mobile phone (Musk, 2020). Although brain-computer interfaces

are still in their infancy, immersive experiential design is already at the point where researchers and indeed game developers can foster the kind of numinous awe and wonder that would previously have been encountered only in nature or houses of worship.

The relationship between health and spirituality is a hot topic of research in healthcare literature (Rousseau, 2014). Although health and spirituality have been connected "in all population groups since the beginning of recorded history" (Koenig, 2012b, p. 1), research into this connection has grown dramatically over the last 30 years (Demir, 2018; Ellison and Levin, 1998; Koenig, 2012a; Koenig, 2012b; Shattuck and Muehlenbein, 2018). Specific aspects of spirituality found to be relevant to health and well-being include participation in a religious community, engaging in spiritual practices, having transcendent experiences, believing in something greater than oneself and experiencing the emotion of awe, especially in connection to nature (Aghababaei *et al.*, 2016).

In recent years, HCI research has also expanded to include the design of technology to support transcendent user experiences (e.g., Glowacki *et al.*, 2020; Kitson and Riecke, 2018; Markum and Toyama, 2020). But techno-spiritual product development continues to outstrip the research in the area. In late 2012 we found that Apple's US AppStore offered approximately 6000 iOS apps tagged for various general aspects of spirituality and religion while the Association for Computing Machinery's (ACM's) Digital Library (ACM-DL) contained only 19 HCI research articles specifically focusing on techno-spirituality (Buie and Blythe, 2013b). In 2020,[1] a Google search of the App Store returned approximately 7060[2] iOS apps, yet the ACM-DL still offers little HCI research on the

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[1]Results of a google.com search conducted 29 June 2020 using the search string <religion OR spirituality OR spiritual OR holy OR "inner peace" OR inspiration OR meditation OR mindfulness OR sacred OR spirit OR faith OR prayer -jeans -nightclub -alcohol -level -wrestling -vitek -diagram -"graphics and design" -vpn -"spirit hunter" -adaptive -burger -troy -"spirit fit" site:itunes.apple.com/us/app>. The search included no terms for specific faith traditions, and it eliminated false positives by excluding terms identified via an inspection of the first 300 results.

[2]We are astounded at this small number. In late 2019 the same search returned more than 40,000 apps. We are not sure what has changed, but we are confident it doesn't mean that the actual number of apps has decreased in the last 16 months. In 2021 the number returned by this search was even smaller, perhaps suggesting that this method of searching the App Store is no longer useful.

topic. Intel anthropologist Genevieve Bell, in her opening keynote at ACM's CHI 2010 conference (Bell, 2010), pointed out that despite huge numbers of users, HCI research had "underexplored" technology use in three areas of life: sex, sport and spirituality. She speculated that the dearth of work in these areas might be due, in large part, to the small numbers of academics interested in these topics. When Bell made this argument, only a handful of HCI papers in the ACM-DL addressed spirituality, and these were primarily the work of Susan Wyche and her colleagues (e.g., Wyche *et al.*, 2007; Wyche *et al.*, 2008a; Wyche *et al.*, 2008b; Wyche *et al.*, 2009a; Wyche *et al.*, 2009b). Now, almost a decade later, spirituality continues to be underexplored in HCI, although (as we shall see) the volume is picking up.

In this monograph, we review relevant research from HCI and a broad range of other disciplines as well — Psychology, Healthcare, Psychopharmacology, Neuroscience/Neurotheology, Museum Studies, Tourism and others. This is not a systematic literature review: there is at once too much and too little literature for this. But HCI has always been a "magpie" discipline, drawing on findings and theories from other disciplines; and in this spirit, we review a very wide range of sources to consider the possibility of designing for transcendent experience. Transcendence and spirituality are deeply subjective experiences and there are many aspects of this topic that academic writing cannot easily approach. For this reason, we have combined a traditional academic review with design fiction.

But what is design fiction, and what has it got to do with design?

1.1   Where's the design in design fiction?

Following the publication of their seminal work *Technology as Experience* (McCarthy and Wright, 2004), Peter Wright and John McCarthy argued that the novel may have more value in designing for experience than more traditional methods of social science:

> "When someone talks about a personal experience they have had, they tend not to be solely concerned with telling people what they did. Rather their story seeks to talk about why

they did it, what it felt like, what it meant to them, its value
in their lives and what commitments they have made as a
consequence. These are not things with which the human
sciences are traditionally comfortable. The realist ontology
of science and its objective third-person stance make the
study of something as firsthand and particular as felt life
difficult. Other disciplines such as art and literary theory
are much more comfortable with the personal and with felt
life. Dewey's work on art as experience (Dewey, 1934) and
Bakhtin's work on the philosophy of the act (Bakhtin, 1993),
for example, shun the abstract theoreticism of both science
and formal aesthetics in favour of an account of experience
which emphasizes the particularity of felt life. So as HCI
turns its attention to experience then, perhaps it is time to
explore new metaphors from other disciplines in order to find
a way of answering these problematic questions." (Wright
and McCarthy, 2005, p. 2)

Since its inception, HCI has devised fictions to explore new and
emerging technologies through scenarios and personas. But over the
last 20 years the use of fiction in research has been transformed from
brief textual vignettes featuring two-dimensional characters to a rich
and varied practice of design fiction.

Mark Weiser's "Sal" scenarios, written for *Scientific American* in
1991 (Weiser, 1991), describe the networked office technologies that we
are using today. Jack Carroll argued that such scenario-based design
was a means of creating a shared language for various experts working
on a project to use as a resource (Carroll, 1999). But Alan Cooper
argued that industry-based scenarios were often examples of "inmates
running the asylum" (Cooper, 1999), with programmers designing for
themselves or for the guy in the next cubicle, rather than for the average
user. Cooper argued for the creation of diverse personas to represent
a range of users in scenarios. Following this, more ambitious uses of
fiction appeared: Nielsen (2002) suggested drawing on European cinema
to develop character-driven rather than plot-driven scenarios. Blythe
(2004) incorporated existing fictional characters from literature and

popular culture to create richer scenarios through pastiche. At the same time, designers were beginning to create fictional prototypes and films as provocations rather than solutions to a particular design problem.

The term "design fiction" first appeared in 2003, when Alex Milton wrote about the student work on a Master's course run by Anthony Dunne and Fiona Raby at the Royal College of Art. Milton describes the work of Noam Toran as exploring "the realms of design fiction through the medium of props and pseudo documentaries" (Milton, 2003, p. 5). The term appears later in Bruce Sterling's 2005 book *Shaping Things*, where he makes this distinction: "design fiction makes more sense on the page than science fiction does" (Sterling, 2005, p. 30). Julian Bleecker's "Short Essay on Design Fiction" (Bleecker, 2009) characterized design fiction as "materialized thought experiments" (p. 83) Bleecker and colleagues would go on to create "TBD" catalogues depicting, in fictional articles and advertisements, devices and services "to be designed". In 2013 Sterling predicted that we would be seeing a lot more design fiction because people had learned how to do it and it was cheap (Sterling, 2013). This proved to be an accurate prediction, and design fiction is now so widespread in academia that many conferences include it as part of the formal programme (e.g., GROUP 2016,[3] GROUP 2018,[4] NordiCHI 2018,[5] TVX 2019[6]).

Design fiction is an emerging set of practices that take many forms including text, images, films, sculpture, models and prototypes. Formats include fake advertisements, articles and also academic writing (e.g., Blythe, 2014; Coulton *et al.*, 2017; Kirman *et al.*, 2018b; Kirman *et al.*, 2018a). The element of design is perhaps obvious in graphics or models which depict a product or service that does not exist yet. But text can also convey a design with as much power as an image, model or film. Franz Kafka's short story "In the Penal Colony", for example, describes an imaginary machine that executes prisoners over the course of 12 hours. An enthusiastic officer explains its workings to a traveler:

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[3]https://group.acm.org/conferences/group16/toc.html.
[4]https://group.acm.org/conferences/group18/toc.html.
[5]http://www.nordichi2018.org/future-scenarios.html.
[6]http://vrethics.info/.

> "It consists, as you will see, of three parts. Over time, each one has acquired a sort of popular nickname. Thus, the lowest part is called the bed, the top part is the engraver, and the suspended part here in the middle is the harrow."

> (Kafka, 2008, p. 131.)

As the image of the machine becomes clearer the traveler and the reader are left to guess the purpose of these parts:

> "It was a large structure. The bed and the engraver were of equal size, and looked like two dark troughs. The engraver was roughly six feet over the bed; the two were linked at the corners by four brass rods, that were effulgent in the sun. Between the two troughs, the harrow hung on a steel band." (Kafka, 2008, p. 132)

Little by little it is revealed that the needles in the harrow serve to write the law that has been broken onto the body of the prisoner:

> "This man here, for instance' — the officer gestured at the condemned man — 'will be inscribed with: Respect your commanding officer!' (Kafka, 2008, p. 133)

The officer carries in his pocket a diagram showing the operation of the apparatus, but it is not necessary to see such a representation to recognize the design in this fiction. The design takes the form of a concept or a proposal; it would be possible to make such a machine and put it on display, but doing this would add little to the idea and lose much of the story's power, which lies in the world that the fiction builds.

1.2 World building and long-form design fiction

Typically, research fiction is brief and episodic — expressed in a short text, a series of images, film, prop or prototype (Blythe and Encinas, 2018). Coulton *et al.* (2017) argue for a "world-building" approach where a design concept is imagined across a range of contexts; their Game of

Drones, a concept for a gamified drone surveilling dog owners who do not clean up after their pets, was pictured in a short film as well as other media such as fake warning signs. This kind of world building is powerful but there are other "world-building" formats including long-form text-based narrative. Tolkien is perhaps the most celebrated world-building writer of the 20th century and he reflected on the practice in his scholarly writing:

> "Anyone inheriting the fantastic device of human language can say the green sun. Many can then imagine or picture it. But that is not enough — though it may already be a more potent thing than many a "thumbnail sketch" or "transcript of life" that receives literary praise.
>
> To make a Secondary World inside which the green sun will be credible, commanding Secondary Belief, will probably require labour and thought." (Tolkien, 1964, p. 45)

For Tolkien, fantasy is best left as words: "the visible presentation of the fantastic image is technically too easy, the hand tends to outrun the eye" (Tolkien, 1964). He argues that dramatic forms cannot adequately represent a sub-created world: "men dressed up as talking animals may achieve buffoonery or mimicry but they do not achieve Fantasy" (Tolkien, 1964, p. 46). But, he argued, long-form narrative text can achieve an experience "very similar to dreaming" (Tolkien, 1964, p. 48). He refers to the making of "secondary worlds" as sub-creation because all secondary worlds must refer to the primary world, the one we live in. However strange the secondary world might be, it must resonate with our experience if it is to have any power:

> "Fantasy is a natural human activity. It certainly does not destroy or even insult Reason; and it does not either blunt the appetite for, nor obscure the perception of, scientific verity. On the contrary. The keener and the clearer is the reason, the better fantasy will it make." (Tolkien, 1964, p. 50)

One strand of design fiction takes the form of academic writing (Baumer *et al.*, 2014, 2020; Blythe, 2014; Blythe and Buie, 2014; Buie,

2018; Lindley and Coulton, 2016). This kind of fictional scholarship has its precedent in science fiction. The Polish science fiction writer Stanislaw Lem wrote several books and stories which featured near-future conferences or reviews of academic articles of the future. Lem's *The Futurological Congress* (Lem, 1976) tells the story of an academic, Ijon Tichy, who attends a conference held at the top of a Hilton Hotel in Costa Rica. The conference space is so far above the ground that the delegates are unaware of the riots happening on the streets below. We have based a "TX Machine" fiction on the structure of Lem's novel to illustrate the themes of the literature we are reviewing. We interleave the literature review with a first-person account of a delegate to a conference on transcendent experiences (TXs) — a sceptic who is reporting on the conference for a "thoughtcast".

1.3 Rhetoric of the (cartoon) image

The fiction in this monograph presents a number of design concepts that could have been illustrated with images made using tools like Photoshop. Manipulated photographs have the advantage of being very quick to make, and they can help "suspend disbelief" to the extent that such designs are sometimes mistaken for real products. Auger's "audio tooth" (Auger and Loizeau, 2001), for example, was presented by journalists at New Scientist as real and (at the time of this writing) it is still described as such in their archive, although it was actually a fiction produced for Dunne and Raby's Master's course (Blythe and Encinas, 2018). Fooling journalists might be regarded as proof of plausibility, but newspapers routinely publish press releases by universities with no fact checking whatsoever (Vines *et al.*, 2013), so this is not necessarily the case. And in an age of "fake news" it also raises ethical issues. Rather than presenting photoshopped images, we have illustrated the design fictions with hand-drawn cartoons by the first author.

The representation of new technologies through shaky hand drawings has a long history in cartooning, going back to the drawings of Heath Robinson's made more than a hundred years ago.
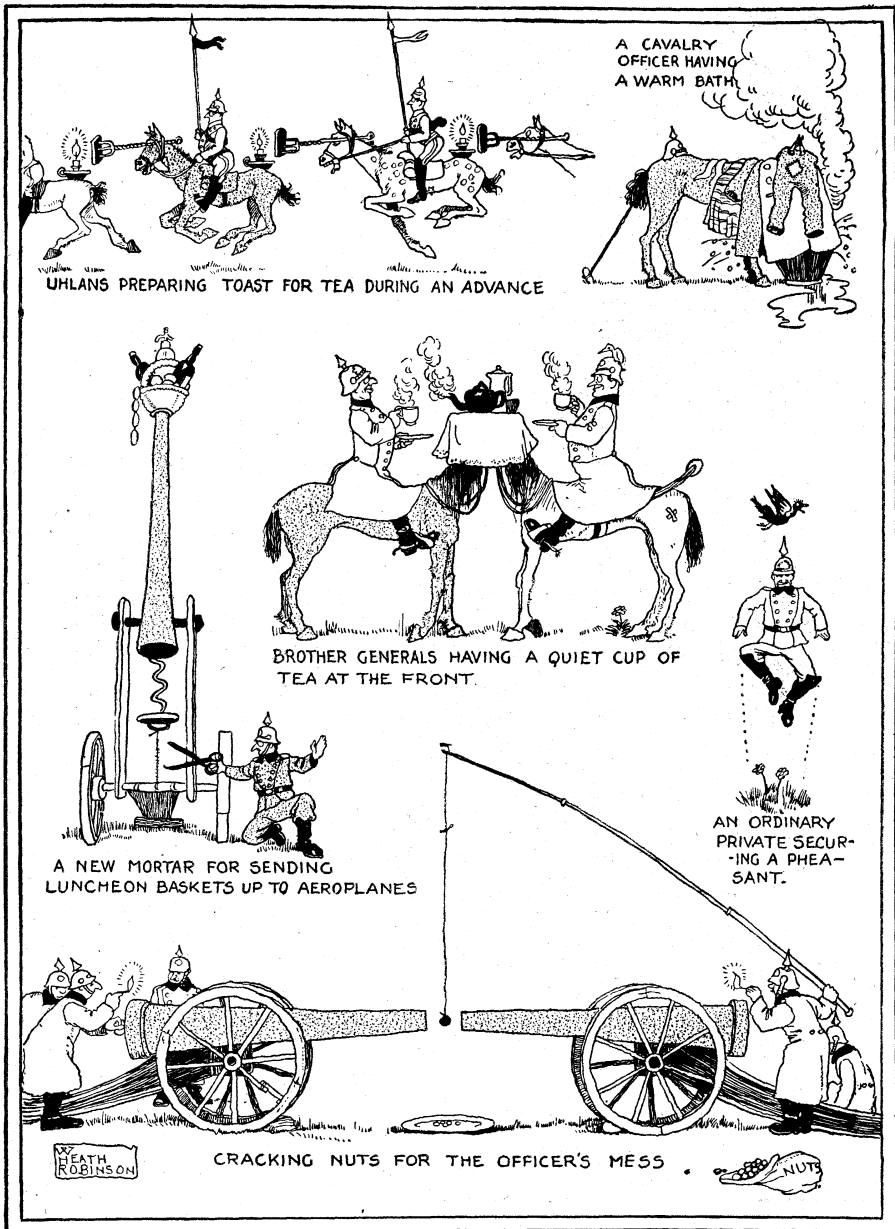
Figure 1.1: World War I Cartoon (https://en.wikipedia.org/wiki/File:Heath_ Robinson_WWI.png).

Source: W Heath Robinson (1915).

Often the intent of such cartoons is satirical or facetious, as in Rube Goldberg's cartoon depicting a "self-operating napkin" created by a Professor Butts:
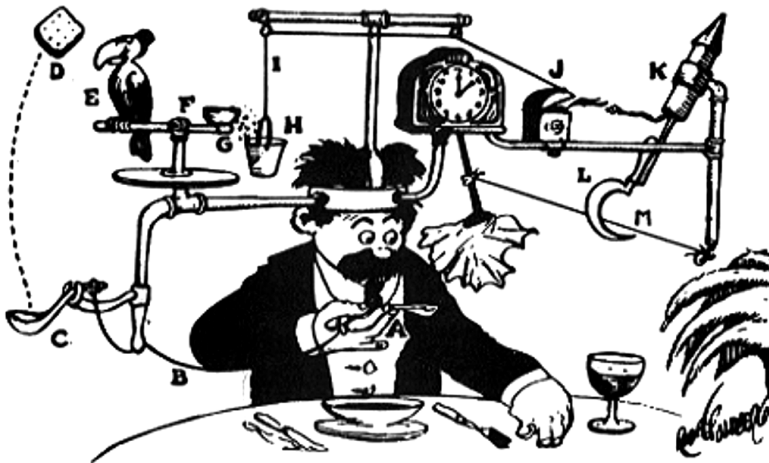
Figure 1.2: Professor Butts and the Self-Operating Napkin (https://en.wikipedia.org/wiki/Rube_Goldberg_machine#/media/File:Rube_Goldberg's_%22Self-Operating_Napkin%22_(cropped).gif).

Source: Rube Goldberg (1931).

The aim of such images is very far from a "suspension of disbelief". They are comical, but this is not to say that there is nothing serious about them. Indeed, Goldberg's satire on technologies offering minor conveniences via a mechanism which causes more problems than it solves is more relevant today than ever. Design fictions which take the form of believable product images may be seductive but, as Marshall McLuhan warns: the medium is the message (McLuhan and Fiore, 2008). Although a design fiction may be intended to provoke or cause reflection, it might just look like yet another strange product in a world full of such things. The cartoon format forces a greater distance from the technological dream and declares itself as resolutely fictional.

As McCloud (2001) and many others have argued, the combination of image and text can result in something which is greater than the

sum of its parts. What follows, then, is an experiment in a long-form design fiction illustrated with cartoons.

So don't say we didn't warn you.

THOUGHTCAST ONE

"I'm not religious but I am spiritual" a bald and bearded person says to someone in an illuminated cardigan.

"The ivory tower of academia is a skyscraper now," says someone who clearly prepared the remark before they got on the bus.

"The top is so far removed from the real world that there could be terrorist attacks down in the city and we would never know it."

It's like a contest for who can make the most obvious remark. I wish I was attending the conference at home instead of stuck in the real world with no off switch.

We are going to the 92nd floor of the Cixin Centre, and this takes a very long time because the Cixin Centre is the fifteenth tallest building in the world. (That is if you are counting usable floors rather than spires, which of course, I am.) The ride takes so long that I have to listen to several "quote-unquote" conversations. Most of them involve the delegates trying to prove that, despite attending this event, they are in fact rational people.

"I'm not religious but I am spiritual" is said more than once. I think this is like saying "I'm not spiritual but I am superstitious". Or "I'm not superstitious but I am irrational". Or "I'm not irrational but I am illogical". Or "I'm not illogical but I am uneducated". Or "I'm not uneducated but I am stupid". Or "I'm not stupid but I am delusional". Nobody admits to believing in anything. But what are these people doing at this kind of conference if nobody doubts their

Figure 1.3: Saying "I'm not religious but I am spiritual" is like saying "I'm not spiritual but I am superstitious."

doubt? I am going because it is my job. I do not believe that everyone else is getting paid to attend.

According to the conference organizers, the number of delegates has doubled since last year and there are now ten thousand, seven hundred and eighty-three people attending. Counting the delegates at the opening plenary, I notice that it is more like nine thousand three hundred and twelve. I suppose some delegates might have overslept or been delayed. Or they could have been meeting each other for a no-sugar-vanilla-synthetic-soy-latte instead of listening to the plenary.

The plenary speaker calls himself "Sadhguru". He is wearing a turban and he has a very long white beard.

He looks exactly like a picture-book illustration of a wise man. I link to his entry in Wikipedia. His real name is Jaggi Vasudev and he is 93 years old. He is an Indian mystic and yoga teacher who once addressed the United Nations. An image search retrieves a photo of him doing this, for those who still believe what they see. Sadhguru tells the story of his first "spiritual" experience:

He goes up a hill, sits on a rock, and loses awareness of what is himself and what is not. He does not know if he is the rock he is sitting on, or the air he is breathing — it is all him.

Well, that's as may be, but I know very well that I am not my chair. It is uncomfortable enough to sit on without having it sit on me. I do not really understand most of what he is talking about, but lots of people clap when he says things. For example —

"look at animals, all finding shelter, getting food, repro-ducing with no problems, look at humans having so much trouble doing these same things."

This gets a lot of applause. I do a neural search for "is sadhguru a conman?" I get 752,611,042 results. The first page of results seems to me, basically — yes.

While he is talking I scan through the conference pub-licity. One small item promotes a demo called "the TX machine". Somebody from the University of Turin called Lisetta da ca' Quirino claims that her technology offers a "techno-spiritual experience". There is a picture of a heart-shaped leaf rendered in 1s and 0s. I expect this is intended to make it look futuristic for surviving baby boomers whose idea of the future is a film from the last century. I look up the researcher and find there are many Lisetta da ca' Quirinos and one of them is indeed a research fellow in computer science at Turin University. I decide I will get an image of myself using the machine. Whatever happens,

it will make a good thoughtcast. If nothing "spiritual" occurs (likely), then I can make a nice debunking piece about overreaching tech. If something "spiritual" unfolds (unlikely) it can be a nice debunking piece about my own auto suggestibility.

When the session ends, throngs of people crowd the corridors and break areas. They are not seeking spiritual fulfilment; they are seeking caffeine. And so am I. I am queuing up for a second cup of "something almost but not totally unlike coffee" (which according to the company's origin story was originally a joke by Douglas Adams which they adopted as a post post-ironic brand name) when I overhear a conversation about the TX machine of Lisetta da ca' Quirino. One guy says he saw someone try it after registering. Even though they had just paid they said they had achieved enlightenment and left the conference. The fee for this conference is very high, so Lisetta da ca' Quirino's technology must have next-generation power to inspire delusions. I want to go straight to the demo. I ask them where it is but they say it is not in any fixed place. Lisetta da ca'Quirino is moving around the conference and inviting delegates to participate individually. Nobody knows what she looks like, so nobody can see her coming. Televangelists and magicians use a similar method, it is called cold reading. They seek out the most suggestible and gullible individuals in a crowd so that their nonsense will work.

I cannot wait to meet her.

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