In the spirit of earlier talks that started with an activity, I want everyone to open up your laptop, iPad, or smartphone, and check your email. While you’re doing that, take notice of something: Are you holding your breath? You probably are. Almost everybody holds their breath when they check mail, and almost nobody realizes it. It’s a small thing, but every time you do it (and think about how often you check your mail) CO₂ builds up in your bloodstream, your body interprets that as a warning, and your anxiety level goes up a little. Your fight or flight reflex switches on.

This often feels like an inevitable state of affairs; and indeed, plenty of people will tell you that it is. Historians of media argue that every new information technology since the invention of writing has been followed by dramatic, sometimes disorienting, shifts in learning and cognition – and we just happen to be living through the latest.

More recently, neuroscientific explanations for our addiction to technology have become popular. We learn to crave the dopamine shots that come when a new text message arrives on our smartphone.
An ancient, subconscious physical system accidentally triggered by a modern technology illustrates how complicated – and problematic – our relationships with information devices have become. Most problematic is that we live in an age of information that often feels like an age of distraction. Technologies that were supposed to help us think better, work more efficiently, and connect more meaningfully with others now interrupt us, divide our attention, and stretch us thin.

I argue that this condition of perpetual distraction is not inevitable. Technologies often seem to be rational, efficient products of impersonal historical processes. They do a great job of hiding space for contingency, choice, and human agency, but they can never destroy it entirely. I want to bring that space back to the surface of our relationship with information technologies. I want you to see that by thinking about your mind and how it interacts with your devices and the Web; by understanding how information technologies change the way we think about ourselves; and by applying some very old ideas to this problem, you can retake control of your digital world, and expand your attention, your ability to focus, and your creativity.
I call this approach contemplative computing. That sounds like a contradiction or oxymoron, and in today’s world it is; but it doesn’t have to be. Contemplative computing differs from things like “cloud computing” or “ubiquitous computing,” that describe technical constellations or capabilities. Those are things you can buy. Contemplative computing, in contrast, is something you do. I’ll highlight four big ideas that help you do it

1. The first big idea is that our relationships with information technologies are incredibly deep, and express fundamental human capacities.

Andy Clark, a philosopher and cognitive scientist at Edinburgh University argues we’re “natural born cyborgs,” forever seeking to extend our minds through technology. This is so, continues Clark, because the “mind” is not confined to the brain, or even to the body.

It’s more useful to think of ourselves as having “extended minds” made up of a network of brain, senses, body, and objects, a network around which different cognitive functions can migrate, be shared, or be outsourced. (Quick example: if you’re like me, you haven’t memorized a phone number since you got a smart phone.)

The extended mind model is valuable because it helps us see what’s at stake when our relationships with technologies go bad. Today’s information technologies, I contend, cause us pain not because they’re supplanting our normal cognitive abilities. These have always been flexible, and it’s not obvious that offloading your memory for things like phone numbers and email addresses is necessarily bad.

The problem is that today’s information technologies are often poorly-designed and thoughtlessly used: they’re like unreliable prosthetics that we have to depend on, but can’t quite control or trust. (This also highlights the limitation of things like the Digital Sabbath movement, which encourages unplugging from the Internet on a regular basis. This can be a good thing, but it’s a break from the problem, not a permanent solution.)

We need those breaks because our high-tech world, in which contemplative spaces are melting as quickly as tropical forests, where work and life are becoming more frantic, and where technologies grow more demanding and irresistible, present unique challenges.

2. But here’s our second big idea. Humans have always had to deal with distraction and lack of focus – and for thousands of years, we have been cultivating techniques that effectively address them.

Buddhism, Zen, and many other contemplative practices have all evolved to tame what Indian teachers called “the monkey mind” – the distractible, chattering, undisciplined mind that can’t focus, can’t sit still, and can’t achieve anything. (Sound familiar?)

Contemplative practices seem to have emerged about three millennia ago, in different parts of the world, as urbanization and the pace of civilized life quickened. In the last three decades, neuroscientists, psychologists and therapists have all observed that contemplative practices can help restore cognitive abilities – memory, attention, focus – lost to physical injury, post-traumatic stress, or chronic illness.

This suggests that contemplative practices don’t just offer a way to settle the monkey mind. They can help us regain control of the extended mind as well.

3. This brings us to our third idea: that in order to change your extended mind, you must first understand how the digital world tries to change you. You have to look closely at how you interact with information technologies, and how you think about those interactions.

Since the Victorian era, interactions with information and communications technologies – with the outer reaches of our extended minds – have influenced our mental models about technology, work, and ourselves. These models often carry unexamined, and damaging, assumptions.
An ancient, subconscious physical system accidentally triggered by a modern technology illustrates how complicated – and problematic – our relationships with information devices have become.

To take but one example, we normally equate intelligence with speed: in English, we say that someone is "a quick study" or a "fast learner." By this standard, computers are getting faster, cheaper, and more powerful, while we're stuck with the same brains as our ax-wielding, cave-dwelling ancestors.

But this comparison obscures the fact that even though we use similar terms for them, computer and human intelligence are actually very different things.

We don't get smarter through physical changes to basic brain structure; from the Neolithic period on, cognitive archaeologists tell us, cultural evolution and increasing intelligence have been driven by increasingly complicated interactions with material environments. Our experiences with computers have recalibrated our ideas about human work and intelligence, and led us to value such computer-like qualities as efficiency, speed and productivity over human qualities of creativity, deliberation and thoroughness. But knowing about such effects can let us resist them.

Self-experimentation and tinkering are complimentary strategies for redesigning your extended mind. Self-experimentation starts with you – with the center of your extended mind – and works outward; tinkering starts with technology – with the edges of your extended mind – and works back.

Over time, you'll learn to notice details of technology use that you hadn't before (like holding your breath when you check your email); understand where they come from; and experiment with solutions that work for you.

You'll get better at figuring out how to adapt new devices to suit your life – not by following abstract ideas about productivity or efficiency, but by shaping devices to fit you.

Distractions actually become less appealing, as the inherent pleasure of attention – of being able to focus your mind where you want – replaces it.

And in the course of becoming more contemplative about technology, you become more contemplative while using technology.

CONCLUSION

It's important to conduct these kinds of experiments, and to learn how to create extended minds that support contemplation, right now – because the problem of technology-accelerated perpetual distraction is only going to get worse.

I don't think anybody here will have any trouble imagining a world in which every built object has a unique digital fingerprint, and anything of value can have its own Internet address. Add inexpensive flexible displays that make any room into Times Square on New Year's Eve. Just for fun, top it off with cheap cameras and sensors that make it trivially easy to document every second of our lives.

Then mix in online games, nano-niche advertising, location-based services, surveillance analytics, real-time social media, software agents and telemarketers. Now imagine all of these competing to capture, commoditize, and resell our attention, immersing us in a bath of related content, friend requests, status updates, reviews, recommendations, ridiculously huge offers, daily deals, and instant alerts. Whether we want it or not.

It's not thoughtful – it's not contemplative – this could be the world in a decade. But it doesn't have to be that way. Future technologies can be designed to cultivate attention, or to commoditize it; to preserve our powers of concentration, or to waste them.

It's said that in life, pain is inevitable but suffering is a choice. In other words, we cannot escape death and loss – they're a part of life, but we can shape how they affect us. I would argue that our entanglement with information technologies is inevitable. But if we understand how our extended minds work, how our devices try to program us, and how contemplative practices can help us remake our extended minds, then distraction can be a choice.

It's more useful to think of ourselves as having "extended minds" made up of a network of brain, senses, body, and objects, a network around which different cognitive functions can migrate, be shared, or be outsourced.