

# Evaluating And Controlling Technology

There are many areas of technology that we may feel needs evaluation. For example, technology that is used in the medical field must be strongly evaluated before introduced to patients. What naturally comes next and seems mostly driven by fear is the desire to control technology. Often, I witnessed others propose ways to control technology without understanding enough to practically do so. The evaluation of technology sat at the wayside and consequently controlling technology suddenly seemed plausible to them. For everyday civilians, denying or rejecting the use of new technology becomes more difficult each day. Obtaining a job within our culture requires much more than walking into a business. At the bare minimum you must purchase a cell phone and pay a provider for service before any business will hire you. Next you will need to transport yourself there every day; if close enough you could simply walk into work or use a bicycle, but this brings on new challenges such as not succumbing to the weather. Maybe you need to purchase an umbrella or watch the weather news on television. These are prerequisites for a job not because the business states them, but because commonly it's assumed of a functional member of society. Generally, a person without any economic resources becomes increasingly difficult to integrate into society. Our government recognizes this problem and helps by providing funding through various ways such as the Lifeline program, a program that provides discounts on phone service ("Lifeline Program for Low-Income Consumer"). One may ask, "Why doesn't the government simply target the root of the problem, which is clearly the rapid expansion of technology, and prohibit their use in businesses?" and to that I would say, "Because they can't." In my simple scenario it seems ethically immoral to require civilians to acquire cell phones, but because scenarios such as this one are so commonplace, we have accepted their existence and treated them with an attitude that symbolizes the gesture that, "It's just the way things are." It must be made clear that technology is not only limited to electrical silicon devices. If I said that it seems unethical to require an employee to have shoes and clothes on you would think I'm crazy. Clothes are also technologies that we have come to accept and expect people to use. It's so deeply nested in our culture that as long as we've been alive its how things have been. Similarly, the adoption of cellphones and more advanced technologies become expectations rather than luxuries. I hope that you can see now - how this becomes a self-perpetuating cycle: new technology is introduced, companies adopt them, now everyone must adopt them, new problems appear as a result, and then we deal with them as best we can when they come. Technology is typically accepted by people, often it makes lives simpler, but not always and not for everyone. Periods such as the romantic era have shown the fears of people and what expanding technology might bring. Then the industrial revolution era brought many changes, such as the adoption of the automobile, which consequently also set our planet onto a path towards biosphere destruction. This was never anyone's intentions, technology aims to be used for the greater good, but despite that we are faced with problems today due to our advances. Should the government step into situations where technology may become disastrous? If so, what should they even do? From the scenario we can say that the government does regulate technology that has impacts on the environment. I think most of us would agree that for the greater good we would not pollute the planet, but it is not always that simple when discussing new technology. Certainly, when lead was put in gasoline no one knew it would destroy the

myelin sheath of axioms in a devastating number of Americans (Sanders, Talia et al.); The truth to that is something I wouldn't dare my worst enemy to learn. There are so many new technologies that we need to evaluate. I selected a few to focus on and the reason why I want to focus on the technologies I am about to describe are because of their image portrayed in various works of film art. To elaborate on why we should evaluate these new technologies, I will describe them in the manner portrayed in these films. The films I will reference are Terminator, Wall-e, and The Matrix. Each foreshadow disastrous faults of the advancing technologies of our digital era. Afterwards, we will take a closer look at the technologies in question and determine how we can evaluate them, then finally, we will discuss ways of controlling these technologies and the practicality and ethicality of how they are controlled.

Terminator is a film series centered around a holocaust of the human species at the hands of a sophisticated artificial intelligence being called Skynet. "Terminator" is a futuristic autonomous cyborg assassin and soldier. The cyborg runs on a CPU with a room-temperature superconducting artificial neural network with the ability to learn ("Terminator (Character Concept)"). Wiki's article about Skynet perfectly summarizes the plot:

Skynet is a fictional artificial neural network-based conscious group mind and artificial general superintelligence system that serves as the antagonistic force of the *Terminator* franchise. In the first film, it is stated that Skynet was created by Cyberdyne Systems for SAC-NORAD. When Skynet gained self-awareness, humans tried to deactivate it, prompting it to retaliate with a nuclear attack, an event which humankind in (or from) the future refers to as Judgment Day. John Connor forms a human resistance against Skynet's machines in the future, which include Terminators, and ultimately leads the resistance to victory. Throughout the film series, Skynet sends various Terminator models back in time to try to kill Connor to ensure Skynet's victory ("Skynet (Terminator)").

In this fictitious scenario, technology has sparked its own war against the human species. There are many advancements of technology in the Terminator series. Many of which were byproducts of the technology themselves. For example, time travel. This is far-fetched, but maybe not for a sophisticated technology that supersedes our own intelligence. The takeaway from this example is that a new form of consciousness is boot loaded by a wet ware, biochemical, and organic being. They are made to be self-sustainable, functional machines that supersede people even in harsh environments. We aren't even close to making this a reality, but the question remains, is it even possible for anything remotely similar. AI solutions that emulate human senses do already exist and are already being used industrially. Computer vision has recently made many improvements, demonstrated at the 2021 CVPR (Conference on Computer Vision and Pattern Recognition): Adversarial examples are introduced to the training process of AI to harden computer vision to deceptibility, self-supervised and contrastive learning requires only raw data versus human intervention with AI training; this allows faster training of other AI models. And vision language, which aims to capture the human perception of visual stimuli through self-supervised learning ("State of Computer Vision"). Additionally, researchers from Carnegie Mellon University produced advancements in optical sensors that allow computers to illustrate images in challenging conditions such as a bright light ("Homogeneous Codes for Energy-Efficient Illumination and Imaging").

Gelsight, tech company, claims to have given industrial robots the sense of touch on their website. Publicly available information from the U.S. Securities and Exchange Commission about Gelsight shows that they have sold securities for six million dollars recently in 2021 and only forty thousand in 2014, from that alone it appears that the company is rapidly growing. Their solutions can generate 2D and 3D models of objects based on the “feel” of the object (“Tactile Robots”). We even have AI that allow computers to detect “smells.” Aryballe is a software company that produces biosensors paired with machine learning systems to simulate the olfactory system in people. They have devised ways to capture smells ranging from food, flavor, and fragrances (“Hardware Products”). As demonstrated, there exists AI that can emulate human senses, and even more AI capable of aiding with the training of other AI. If we integrated these AI models into a single unit, it would be symbolically a “terminator.” There are limitations of the modern architecture of computers that stand in the way of AI. However, the quick pace at which this technology is advancing and the functionality that it has achieved already is nothing short of astonishing. Realistically, AI technology is primitive enough to where it foreseeably will not be a threat to the species for a very long time, but it threatens working class citizens and their livelihood today. The introduction of AI to industries means less manpower is required to do tasks. As such, a decrease of job opportunities is an apparent by-product. Many positions may be replaced by a single position, one that simply maintains and runs the autonomous machines. This is advantageous to corporate America, but disadvantageous to its working-class citizens. Demonstrated throughout history is the same narrative. The result was an increase of higher paying jobs that require more skill, and less low paying jobs that require little to no skill. Then for the sake of innovation, is it ethical to decrease the value of human labor? Should the government be intervening? Perhaps innovation will produce more meaningful work and overall happiness in people. Physiological studies show that people feel most rewarded when we see a task through, but when people are only acting as a mere cog in a greater system there is a dissonance between them and the end-product. It results in people feeling unfulfilled, stuck, and bored. Innovation also creates a demand for more education, but as a downside, others who simply can’t meet those demands are left with no economic value. In these circumstances, the government relieves the dislocation pains with momentary funds through unemployment programs while they try and find a new job or learn new skills; this is done at the cost of employers, rightfully so. It is safe to say, looking at history, that the low-skill jobs will essentially be replaced. Otherwise, this creates a bad situation for businesses. Starving consumers are unable to purchase supplies due to their unemployment, and as a byproduct, businesses produce less income. Henry Ford struck against this dilemma when he wanted to pay his employees enough to buy the vehicles they were making. However, how long can this go on? Will we reach a point where human labor becomes valueless in comparison to technology? At some point we may run out of jobs for even the most educated. Imagine the side effects of perfected AI self-driving vehicles. It will lead to the dismantling of many industries. Fast forward into the future and we have a Segway into our next film.

Wall-E is a fiction film based in 2805. It follows a solitary robot on a future, uninhabitable, deserted Earth. Wikipedia summarizes the plot as such:

In the 29th century, Earth has become a garbage-strewn wasteland due to rampant consumerism and corporate greed; seven centuries earlier, the megacorporation Buy-n-Large (BnL) evacuated humanity to space on giant starliners. Of all the trash compacting

robots left by BnL to clean up, only one robot remains operational, *Waste Allocation Load-Lifter: Earth-Class* (WALL-E). It learned to survive by using salvaged parts from other broken-down robots to repair itself, and after centuries of life experience has developed sentience, including a sense of curiosity about artifacts from human civilization.

One day, WALL-E's routine of compressing trash and collecting interesting objects is disrupted by the arrival of an unmanned probe carrying an egg-shaped robot named *Extraterrestrial Vegetation Evaluator* (EVE), who has been sent to scan the planet for signs of sustainable life. WALL-E is smitten by the sleek, otherworldly robot, and the two begin to connect, until EVE goes into standby when WALL-E shows her his most recent find; a living seedling. Sometime later, the probe returns to collect EVE and the plant, and, with WALL-E clinging on, returns to its mothership, the starliner *Axiom*.

In the centuries since the *Axiom* left Earth, its passengers have degenerated into corpulence due to laziness and microgravity, their every whim catered to by machinery. The captain, B. McCrea, is used to sitting back while his robot steering wheel AUTO pilots the ship. McCrea is unprepared to receive the positive probe response, but learns via a pre-recorded message from BnL that placing the plant in the ship's Holo-Detector will trigger a hyperjump back to Earth so humanity can begin recolonization. When McCrea inspects EVE's storage compartment, however, the plant is missing, and EVE blames WALL-E for its disappearance.

EVE is deemed faulty and taken to Diagnostics. Mistaking the process for torture, WALL-E intervenes and inadvertently releases a group of malfunctioning reject-bots, causing him and EVE to be designated as rogues. Angrily, EVE tries to send WALL-E home in an escape pod, but before she can do so, they witness AUTO's henchmen GO-4 stowing the plant in a pod set to self-destruct, revealing that WALL-E did not steal the plant. WALL-E attempts to retrieve it, but is launched into space in the pod. EVE uses an emergency exit to chase after WALL-E, and witnesses the pod explode, although both he and the plant survive unscathed. He and EVE reconcile, celebrating with a dance in space around the *Axiom*.

EVE brings the plant back to McCrea, who has been watching her recordings of Earth and concludes that they can and must save it. However, AUTO refuses, explaining that he has been programmed with the secret directive A113, issued after BnL declared in 2110 that the planet could not be saved, which ordered him to take control of the ship and never return to Earth, and reveals that he ordered GO-4 to get rid of the plant. When McCrea countermands the directive, AUTO and GO-4 mutiny, electrocuting WALL-E's circuit-board, putting EVE into standby, throwing them both down the garbage chute, and locking McCrea in his quarters. EVE and WALL-E are nearly ejected into space along with the ship's refuse, but cleaner robot *Microbe-Obliterator* (M-O), who had been following WALL-E's dirt trail across the ship, saves the two by alerting the WALL-A bots and prompting them to abort the ejection. As humans and robots help in securing the plant, WALL-E, EVE, M-O and the reject-bots head to the Holo-Detector, while McCrea and AUTO fight for control of the ship; GO-4 attempts to aid AUTO, but he is caught in the scuffle and destroyed. WALL-E sacrifices himself by allowing himself to be crushed by the

Holo-Detector, jamming it open and buying EVE time to successfully insert the plant, which initiates the hyperjump. McCrea eventually overpowers and deactivates AUTO by switching him to Manual Mode.

Arriving back on Earth, EVE repairs WALL-E, but finds that his memory and personality have been erased. Sadly, EVE gives WALL-E a goodbye "kiss", which restores him back to his normal self. WALL-E and EVE reunite with M-O and the reject-bots as the inhabitants of the *Axiom* take their first steps on Earth. During the credits, humans and robots turn the ravaged planet back into a paradise, and the plant is shown to have grown into a mighty tree, which EVE and WALL-E rest beneath.

(“Wall-E”)

Technology has grown into a tremendous force in Wall-E. People in the film are very reliant on specialized machines that serve their every whim. Every task gets done by the machinery and the only thing people are responsible for is not going extinct. Due to their over-reliance on technology, the people who are alive are quite pathetic. They are incapable of doing even the simplest of tasks. It's no surprise here that the technology evolves into the film's main antagonist when the control center, AUTO, rejects any human intervention. The grim takeaway from this film is that not only do people bring the planet to the brink of extinction forcing them to leave, but they also become slaves to the technology, and don't even realize it. Although it may appear that they are in complete control, it only gets revealed that is not the case when it's time to return to the planet. As discussed earlier, with advancing technology comes a decrease in the value of human labor. In Wall-E, people were no longer required to do anything at all. In reality, if all the labor-intensive work was solved, people may find themselves spending all their time with entertainment and art. It's hard to imagine a world without economics as we see them today, but through speculation people may end up spending all their time working on new ways to entertain themselves. Perhaps we will stick to traditional methods, funds may be earned by recruiting autonomous systems and having them do work for you. The possibilities are endless, but one concerning thought remains, our enslavement to technology. That leads to a Segway into the next film, The Matrix.

With the evolution of technology there are new forms of entertainment available that have never been seen, such as virtual reality. Virtual reality is an immersive digital environment meant to feel as though it's real life. Although this new form of gaming is still in its primitive stages, virtual reality may grow to be undifferentiable from reality. In a world where anything is possible, virtual reality becomes more attractive than reality itself. Companies such as Neuralink are devoted to creating technology capable of interfacing with the human brain. They do this with the goal of allowing disabled persons to live functioning, meaningful lives. However, this sort of functionality could be used in many different industries, especially those working on artificial reality. Earlier I mentioned the possibility of people becoming over reliant on technology to the point where they were persuaded to remain ignorant. This was generally a large portion of Wall-E's plot. In The Matrix, a simulated reality is used by a dominate technology that literally enslaves people to use them for energy. The plot summary provided from Wikipedia is as follows:

The series features a cyberpunk story of the technological fall of humanity, in which the creation of artificial intelligence led the way to a race of self-aware machines that imprisoned mankind in a virtual reality system—the Matrix—to be farmed as a power source. Occasionally, some of the prisoners manage to break free from the system and, considered a threat, become pursued by the artificial intelligence both inside and outside of it. The films focus on the plight of Neo (Keanu Reeves), Trinity (Carrie-Anne Moss), and Morpheus (Laurence Fishburne and Yahya Abdul-Mateen II) trying to free humanity from the system while pursued by its guardians, such as Agent Smith (Hugo Weaving, Abdul-Mateen II, and Jonathan Groff). The story incorporates references to numerous philosophical, religious, or spiritual ideas, among others the dilemma of choice vs. control, the brain in a vat thought experiment, messianism, and the concepts of inter-dependency and love. Influences include the principles of mythology, anime, and Hong Kong action films (particularly "heroic bloodshed" and martial arts movies). The film series is notable for its use of heavily choreographed action sequences and "bullet time" slow motion effects, which revolutionized action films to come.

(“The Matrix”)

Of course, these films are all radical examples of our current technology. Before we get to the level of sophisticated tech that even allows these fictions to be remotely possible, we will encounter many other detrimental obstacles far in advance. Based off historical events, advances in technology meant low pay, low skill jobs are replaced by machines while higher pay, higher skill jobs replace them. This disjoints many people, and rapidly as technology advances it'll keep happening. This opens many possibilities for catastrophe, but nothing quite as devastating as the current threat nuclear war imposes. The possibility of AI is endless and before long we are in a realm of pure speculation when trying to predict what may come of it. Government intervention can only go so far. Problems are realized far too late to do anything about it. The government provides some resources to relieve growing pains and we continue to evolve with a focus on evolving. When its obvious regulation is needed, as in with situations with serious pollution, then the government justifiably intervenes. We owe it to ourselves to continue innovating and coming up with new ways to solve problems. Especially those we've already started. That is, the consumption of non-renewable resources for energy. Like the novels wrote during the romantic era, today we have other forms of art. Now we have movies, and they fantasize our latest technology. In hindsight, evolving technology may spark revelations that either make or break us. Ignoring the future, potential problems is completely unethical, but there's only so much that can be predicted, we can only focus on what we do have. Historical artifacts hint that technology will continuously disrupt the working-class. Stopping innovation isn't plausible, but there are ethical ways this should be handled - softening the blow and preparing people in advance would make these shifts less traumatizing – but also, stopping innovation is unethical. It is important that everyone can play some role in society, but menial, laborer jobs create low waged, unhappy, unfulfilled employees. There is no easy answer to this, and I'd be lying if I said I had any better ideas. Often situations become evermore intricate than we can predict.

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