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The aim of art, the aim of a life can only be to increase the sum of freedom and responsibility to be found in every man and in the world.

--Albert Camus¹

When the Algerian-born, war-raised Camus described this notion of art and life, he argued that the “Wager of Our Generation” was that human society would mature faster than our technology (specifically the Bomb). While the jury is arguably still out on society's maturity, it is clear that we continue to create more, increasingly sophisticated things—more accurate and efficient weapons, ever more tightly integrated technologies and fantastic new methods for exploiting nature, science, and our fellow humans. The integration of technologies, such as those necessary for autonomous machines in particular, have long been the fodder of science fiction writers and popular culture. For every set of law-abiding Asimovian robots², there is a set of of humanity-usurping replicants³ and for every wonderful achievement there is a corresponding cyberpunk nightmare. It is perhaps unfortunate that techno-pundits focus so much on the extremity of both technology (focusing on the high-end only) and the “goodness” or lack thereof. Technology is a continuum of both sophistication and virtue, so if we as a society insist on anthropomorphizing it and assuming that it has both needs and desires, it follows that we are

1 "The Wager of Our Generation," Resistance, Rebellion, and Death, 240-241.

2 Notably R. Giskard Reventlov and R. Daneel Olivaw.

3 Do Android's Dream of Electric Sheep? by Philip K. Dick, the basis for the movie Blade Runner. Though Dick called them just “androids” or “andys.” “Replicant” is the Blade Runner term.



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obligated to consider all segments of technology—the primitive and sophisticated and the “evil” and “good” alike. If technology is an extension of humanity (as its persistent treatment as pseudo-human would imply), then it follows that its creators also have some level of responsibility to both its art and artifice. Excluding the extremities of technological desire from consideration, it is likely that the guiding principle should be to maximize the usefulness of a given technology for the longest possible time and the maxim of any creator's action should be to help ensure that usefulness.

Technology at its most sophisticated is both a wonder and a subject of constant debate. Genetic engineering has led to unprecedented advances in fields ranging from medicine to plant and animal husbandry while robots can do increasingly complex work in assembly and other tasks (indeed, one need only watch the Science Channel's How It's Made to see a myriad of computer-controlled machines making a wide variety of things). Extrapolating from current development of computers in general, some scientists have estimated that robots capable of human-style reasoning may show up by the middle of this century.⁴ Writers often dwell on this rapid progress and assume that it will be the destruction of humanity, as though the sophistication of these devices need only reach some tipping point before they arbitrarily decide that the now-inferior human race be scheduled for a dose of apocalyptic doom. While auto workers displaced in the 1980s, certain high-precision machinists through the years, and

4 Moravec estimates 2040. p215, column 2.



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disgruntled chess champions might agree with this assessment, it would seem that the human race is still reasonably occupied in the pursuit of progress and seems to be (to an approximation) in control of its destiny. If past performance of technology in our lives is any indication, technology's place is to augment our lives and become parts of its weave—not to supplant us entirely. In this sense, the leading edge of technology cuts not like a sword but more like a needle that pokes through the fabric of our lives. Since we assume that technology has “desires,” if we assume that the desire of technology is to subsume humankind, then discussion is irrelevant—we will either destroy ourselves, or not. On the opposite end, if the desire of technology is to not want existence at all, then everything we have ever invented as humans, from wooden spears and fire to automobiles and computer chips are at some level unethical. Discussions of the extremes of technology's desires thus ring somewhat hollow, and the middle ground is more fruitful for both reasonable discussion and flights of fancy.

Given that which technology already has—a semi-sacred place in our daily lives, it may be that filling this special place is precisely what technology desires. If we as a society insist on giving technology some modicum of human values, and we assume that its collective feelings are directed at neither self-destruction nor domination, then the only path left is that of symbiosis. Symbiosis in nature implies a self-sustaining relationship between two parties that is mutually beneficial.⁵ A clownfish, for example, cleans the anemone, who in turn protects the clownfish

⁵ I diverge here only slightly from the dictionary definition of “A relationship of mutual benefit or dependence.”



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from larger predators. In the human-technology symbiosis, the human conceives, designs and ultimately builds and uses technology while technology provides the human with additional ability to affect his or her will. The responsibility of the technology in this relationship is thus simple in that it should perform as intended (which, unfortunately, may or may not correspond with design). On the other side, the human has the responsibility to conceive, design and ultimately build technology at its simplest, but also to allow a given technology to do its job—to be as useful as possible for as long a period of time as possible.

Humans seem natural at designing and implementing technology. Engineers in particular are keen to invent new things, despite the classical requirement for “1% inspiration and 99% perspiration.”⁶ The problem, and that which creators must be able to will the maxim of their actions to do, lies in squeezing as much usefulness out of a given technology as is possible. Inventors in general, and computer scientists in particular, however, like to start from scratch more often than is really necessary. Indeed, the backlash from this is the oft-proposed practice of reusing existing software components, or “code.” Code, according to this dogma, should be “refactored” as necessary to allow the bolting-on of additional new code, and is much of the basis for most Software Engineering courses⁷. From the software industry's perspective this is a good idea for productivity, but it also exemplifies the programmer's duty to his or her creation: Make it as useful as possible for as long as possible. By reusing existing code, extending it, and

6 Commonly attributed to Thomas Edison

7 SJSU's CS160 in particular is a good example of this.



William J. "B.J." Black
4317535
Phil 134 MW 7:30
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making it useful longer, it need not be remade and the creator's ethical duty is fulfilled.

Similarly, "bad" creations are likely to be scrapped by necessity and it is the creator's obligation to keep that from happening through good design strategies, implementation and maintenance.

In much the same way that a parent must teach a child to behave appropriately or a dog owner must teach the pet boundaries, a designer must "teach" its creation to do the right thing in as many situations as possible. While society may see this as the creator's responsibility to humanity, it is just as accurate in this framework to call it the creator's responsibility to the creation. To do otherwise is using the creation solely as a means to an end to get the job done, and not treating it with the respect it deserves as an extension of the creator's humanity.

Looking at that which technology "desires" and avoiding the extremities of possibility, it is likely that most technology should desire to remain as useful as possible for the longest time possible, and it is the responsibility of the creator to ensure the usable life of the creation. If technology does indeed desire the symbiotic relationship it generally has with humanity, then the roles that humans and machines play are easy enough to define and humans fall short only in their responsibility to protect their creations from the "predators" of societal norms and obsolescence. Simultaneously, protecting creations from these predators has broader effects as well. Obsolete equipment more slowly will have generally positive environmental and economic impact while "well-behaved" inventions will weave themselves more deeply into society, improving the symbiosis and the fortunes of machines and humans alike. Albert Camus



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would likely argue here that nuclear weaponry is not “well-behaved,” and he would likely be right. There are, however, thousands of well-behaved technologies that were spawned from the same basic principles and even many of the same actors. The purpose of art may well be to increase the responsibility of humanity, but humanity is similarly responsible for its artifices, who in turn are responsible for the enrichment of humanity.



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