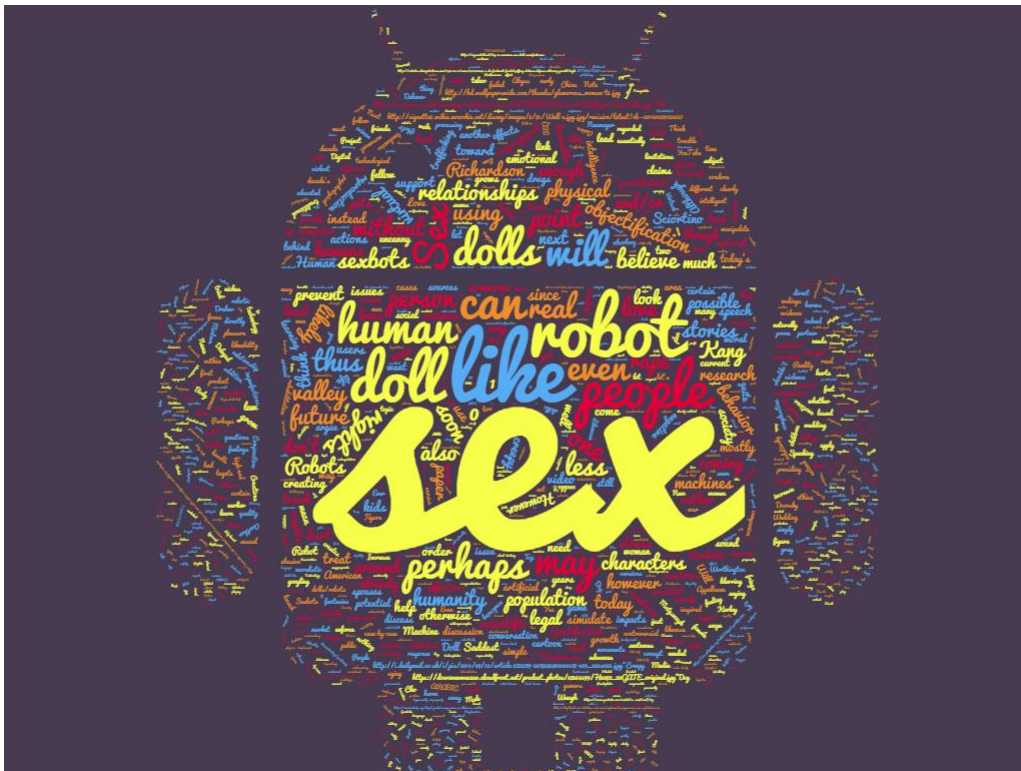# Sexbot Unpacker: I Dive into the Near Future's Tech and Ethics

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Introduction

Thinking: "Controversy's cool. And what more controversial and interesting subject in computer science and engineering (my major), which also spans the subject's full breadth, than sex robots?" is what catalyzed this research. Sex is also a hot, eye-catching topic. So, without further ado, here goes:

In 2017, high-end sex doll manufacturer Abyss Creations plans to launch one with rudimentary reactions and speech. That's next year. Perhaps you would never try it. But your kids who will grow up growing attached, like some young adults today, to cartoon characters or robot pets like the Tamagotchi or robot maids may be less averse to the idea. In an anecdotal survey of 20 of my high school friends, admittedly fans of anime, I asked, "Would you try banging a robot inspired by [their favorite anime character]?"

 "Hell yeah," replied over a third of them.

More scientifically, The [Sex] Doll Forum hosts over 18,000 members (Callil 2016).

So sexbots are coming soon, to a market with unignorable demand. But their blurring of lines between living and non-living, sentient and non-sentient begets moral conundrums. Conundrums like challenging traditional notions of using tools like slaves, or punishing harmless immoral behavior versus providing outlets (legalizing vs. criminalizing childlike sexbots for pedophiles). And indeed, the myriad use cases of such semi-sentient robots place a giant question mark on what to do about their arrival for the uninitiated public. To slightly taper my scope, I chose to discuss mostly sex robots likely to come within the next decade or so, sans human level intelligence, sans superhuman dexterity, sans other terminator-level features. Still, much is to be discussed. I'd like to share my journey in researching sexbots to all willing to read—be you for, against, very against, super for, mega excited, neutral, whatever—so that when they arrive, we

will have formed a framework to develop educated opinions, rather than go purely off our gut feeling or dogma to condone or condemn sex robots. Even though I'm generally in favor of sexbots (I am, after all, a Computer Science major big into future tech), I acknowledge both sides' merits because only by understanding both pros and cons can we as a society best progress.

But say you don't care about society. I assume you still want what's best for yourself, your friends, or your parents as you and they grow older (and perhaps lonelier) and your kids in a world with sex robots. Wouldn't you like to educate yourself so they may learn from you and this balanced, scientific paper, rather than some online churnalism?

Scope and Background: No Terminator, Little VR

Sexbots are coming (punintended [*sic*]). And soon, too. Robots who accurately simulate our emotions may lie in the distant future, and are perhaps even impossible—the existence of a 'quintessential humanness' never to be artificially replicated is the topic of another paper. Robots that act and react and learn in a way convincing enough to engender affection, however, could well come within a decade. My essay explores the societal impacts and ethics behind such robots, bearing in mind their technological limitations. Will they cut population growth? Will they exacerbate anti-social tendencies? Destroy relationships? Increase sex trafficking? Promote human (mostly women's) objectification? Should they have rights? Through analysis of and extrapolation from current use of sex dolls, sex machines, sex work, virtual worlds, and drugs, I aim to untangle the issue of these love machines and discuss their potential benefits and harms, in order inform you, prompt contemplation, and suggest potential sex-robot policies.

There's one other point I must stress early on, though: Do *not* blindly follow doctrine that suffocates discussion and stifles progress. Think critically; have conversations. In October 2015, Malaysian authorities cancelled "The Love and Sex with Robots" conference, citing "illegality." Police Chief Tan Sri Khalid Abu Bakar said that there was "nothing scientific about having sex with machines" (Bakar 2015). Had he done his research, he would understand that artificial intelligence (AI), psychology, and voice reproduction power the intellectual interactions of the robots; robotics and mechatronics endow it with motion; material science bestows to it realistic skin, hair, bones, flesh. All these thriving aspects of science represented in this product area and he says there was "nothing scientific?" Ludicrous! Given this essay's scientific nature, let's establish that we all support intellectual communications and reject dogmatic censorship.

Speaking of intelligence, computers today can beat people in *Go*, an East-Asian board game with a *lot* ($\sim 2*10^{170}$) of possible legal positions. Due to that number's sheer size, unlike chess, computer Go players *cannot* exhaustively search possible moves to determine the optimal next move. Google's AlphaGo, their computer Go player that beat Lee Sedol (world rank 2) must thus employ heuristics and intuition, much like humans, in order to decide. Even its deep neural network machine learning structure, i.e. its learning system, mimics the human brain (Hassabis, co-founder of Google DeepMind, 2016). Combine AlphaGo's learning capabilities with the past decade's advances in natural language processing and language reproduction, and we can soon—I'm guessing by 2025—talk to virtual personalities as we talk to fellow people. In fact, Google's Allo text messaging app already includes a Google Assistant AI whom one can communicate with relatively naturally. Sexbots' AI will soon carry out simple conversations and reproduce simple "dirty-talk" well. In fact, as mentioned earlier, sex robots with simple AI are coming soon—2017 soon. Abyss Creations' plan to launch RealDolls with "basic words, simple

movements, and vibrations in response to touch" for about 13,000 USD next year (Waugh 2016). Next. Year.

Their skin and flesh, as well, will feel real; today's sex dolls', manufactured from high-quality silicone with metal bone structures, already do. Vice's resident 'sexpert' Karley Sciortino could not tell by touch, whether "[a male sex doll's] was a real [penis] or not" (Sciortino 2016, 15:39).

Realistic motion, however, is further away (Matyszczyk 2015); perhaps only by 2050 will they replicate fine human motor skills. Fortuitously, sex dolls having speech but no movement protects users from possible physical harm caused by robot activity. The worst scenario that could happen today is not a robot trying to strangle you, but one perhaps falling on you. RealDoll's (one of the top US sex doll manufacturer ("Top 10 American Sex Doll Manufacturers" 2016)) current sex doll options mostly range between 30 to 40kg (70 to 90 pounds), so, combined with their soft skin and spread-out mass, they shouldn't drop on someone hard enough to hurt them. Just to check, I web-searched "sex doll hurts person," to no avail (yes, I scanned up to page 9). That even without filtering nonsense I still couldn't find an article should say something about sex doll's physical safety. We thus focus on the psychological and societal impacts of sex dolls and robots.

Reducing Responsibilities and Population?

Already, anecdotal instances of sex dolls filling psychological needs and niches populate the internet. In googling "sex doll hurts person," I instead stumbled upon an article titled: "Dying man marries sex doll: Saddest wedding ever?" ("Saddest Wedding Day Photo Ever" 2015). Apparently, a person with cancer wanted a high-end wedding photoshoot with a 'wife,' but did not want to hurt any woman's feelings, so he married a sex doll instead. That article further told a story of a terminally ill middle-aged man who carries a 145cm child-like sex doll around and treats it (her?) like a daughter (he does not have sex with it).

Soon, sex dolls, augmented with speech and cognition, could provide solace to an even broader audience: A depressed person who does not want to trouble a real human being with their emotional instability could turn to a virtual companion complete with a physical form, maybe just to hug or have around, not necessarily to penetrate (a poll on The Doll Forums actually indicated that 53% of 342 sex doll owners did not buy them for sex ("Poll […]" 2016)); a business person too busy to maintain a 'real' relationship could buy a partner that can help him cope with work stress without adding relationship stress; someone who's simply into sex robots or other special fetishes can realize their fantasies. The near future with mostly stationary robots definitely cannot lead most of us to eschew human relationships. But, for those fringe people, or for those in countries with gender population discrepancies (i.e. China), love dolls could improve their quality of life.

However, in China, critics argue, rising sex robot use could also induce trouble: less reproduction and thus an aging population. I would argue that population aging spans the globe in developing and developed countries and its scope exceeds that of sex dolls/robots; wealthier, more educated people simply tend to have babies later (and thus less), because they focus on

their careers, and people are living longer. Further, due to sex robots' current creepy nature and technological limitations, I highly doubt enough of today's or the 2020s' people would forgo human relationships to significantly affect overall population. Thus, near-future sex robots would likely only fill niches like the socially awkward in China (or other countries with gender population gaps), the handicapped, or people who love cartoon characters enough that they would rather date and have sex with cartoon-character-based love-bots.

Indeed, unplanned pregnancies are a global issue, predicted to cause an extra 2 billion (on its own) in population growth by 2050 (Adshade 2016). I believe sex robots, offering sexual pleasure without the risk of pregnancy, could curb such unwanted miracles. I doubt the world needs much more people in general (read on overpopulation), especially those raised sub-optimally due to their unexpectedness. Yes, not all unexpected children are unwelcome, and not all grow up worse off, but my intuition tells me those kids would live better lives were their arrival planned.

The Uncanny Valley

The real crux of my academic research lies in their use's ethicality and possible effects on social attitudes. Sex dolls are beginning to resemble humans and gain enough conversational skills that for some, robots are climbing up the uncanny valley. This begets some problems, but let's first explore the figure.
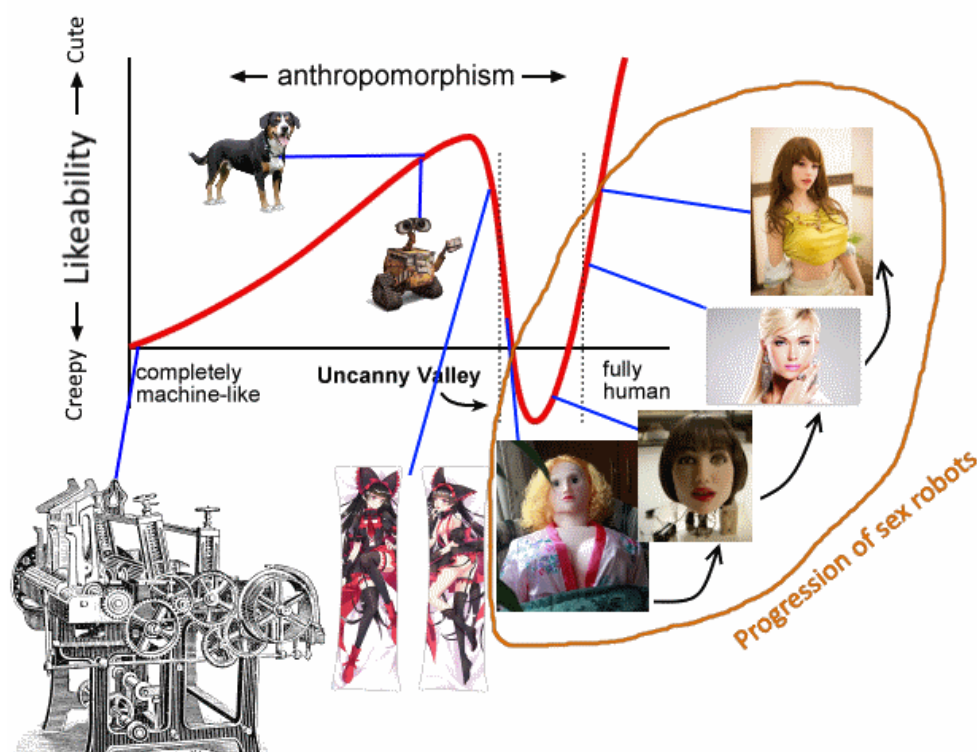

Figure 1 The progression of the sex robot   blue lines indicate position on graph
Image sources:
"Human woman" http://hd.wallpaperswide.com/thumbs/glamorous_woman-t2.jpg
"Realistic sex doll" http://i.dailymail.co.uk/i/pix/2014/08/12/article-2722779-2078683800000578-409_306x423.jpg
"Creepy sex doll head" http://i2.mirror.co.uk/incoming/article5870670.ece/ALTERNATES/s615b/Intelligent-Sex-Dolls.jpg
"Old sex doll" http://i3.mirror.co.uk/incoming/article6955395.ece/ALTERNATES/s810/CEN_SexDoll_02.jpg
"Body pillow" https://d1nr5wevwcuzuv.cloudfront.net/product_photos/37264599/H3082_20GATE_original.jpg
"Dog" http://cdn1-www.dogtime.com/assets/uploads/2011/01/file_23262_entlebucher-mountain-dog-460x290.jpg
"Wall-E" http://vignette2.wikia.nocookie.net/disney/images/8/85/Wall-e.jpg.jpg/revision/latest?cb=20140429123637
"Machine" https://upload.wikimedia.org/wikipedia/commons/a/ac/PSM_V39_D312_A_gilling_machine.jpg

The uncanny valley, translated from robotics professor Masahiro Mori's "不気味の谷現象" ("bukimi no tani genshou," lit. "eerie valley phenomenon"), predicts a graph on which the

likeability of a robot (or any thing) grows until it gets too lifelike, at which point likeability drops into a valley until it becomes lifelike enough to be likeable again (Mori 1970). A dog or Wall-E, for example, evokes more positive emotional responses than a zombie, or in this case, the old sex doll or the creepy robot head. The old doll and head look almost human, which triggers us to subconsciously expect more humanness, yet they fall short. The expectation-reality gap creates cognitive dissonance, which results in us feeling creeped out. Modern sex dolls, however, are closely approaching human-level appearances. They will be less and less creepy for more and more people.

To interactively exhibit this, I actually swapped the positions of the real human face and the latest sex doll (with the yellow top) from their supposed place on the curve. If you couldn't tell, don't worry, its photorealism surprised me too. There I was, drinking water as I scrolled through a gallery of sex dolls and, "prrft," came the sound of me spraying my computer screen, displaying an Asian-looking beauty.

"That's a sex doll?"

If you could tell, well, I guess the manufacturers still have a bit to go. My artist friend who retouches faces with photoshop could still immediately tell, but I was fooled for at least a few seconds even with the high-resolution image.

The physical realism does, however, create greater expectations of speech and movement. A classmate who was curious about doll sex asked me: "Isn't it like having sex with a corpse?" And right now, the answer is, "Yeah, pretty much." But again, natural language processing and reproduction are coming soon, and so is basic vibrating response to touch. Plus, for those who seek 3D versions of their favorite cartoon characters, they don't even have to look that human. For more than a few, sexbots are already past the valley; for many more, they soon will be.

Objectification

As they look and sound more and more human, critics—feminists, in particular—worry that if we continue to treat sex robots like objects, society—especially men—could be more prone to objectifying others—especially women (Richardson 2016). Male sex dolls have begun to surface, too (Sciortino 2016), but more male objectification won't solve female objectification. Given how humanely many people treat their Tamagotchis and virtual partners and even computers (Levy 2007, Ch. 4), I think most users won't abuse their sexbots. After all, excluding the few people into rape-play and whatnot, why would the anime lover hurt his favorite character, or the businessperson damage his costly partner?

Nevertheless, we shall entertain the concern of increased objectification. Obviously, since sex robots are of the future, studies on the direct impact of sexbots have not occurred. However, parallels exist.

Enter senior research fellow in the ethics of robotics at De Montfort University, Kathleen Richardson, who "[opposes] any efforts to develop [sex robots] that will contribute to gender inequalities in society" (Horton 2015). She cites that countries that legalize prostitution see an increase in sex trafficking, which I looked up and verified (Cho, Dreher and Neumayer 2012)—it's true. Having said that, sex trafficking and legal prostitution are extremely closely linked, while objectification of sex robots does not directly translate into objectification of humans. Richardson's chosen data demonstrates that more human objectification leads to even more human objectification, despite the key difference of legal prostitution being, to an extent, by choice. However, near-future sexbots will not have genuine feelings (or even closely simulate them) nor much complex thought nor much mobility. People who chuck a baseball around do not chuck their spouses around the same way, and though sexbots do look a lot more human than a

baseball, the ones of the near future may not be human enough to promote human objectification. Because of the link's uncertainty and Dr. Richardson's obvious bias (leading to her, perhaps, cherry-picking the prostitution to sex-trafficking link), we should also explore other analogous links, like the analogously controversial link between video game violence and aggressive tendencies. Analogous because video games are virtual, yet simulate reality, like how sex robots are artificial, yet simulate a real companion.

A meta-study by the APA found that there is a significant correlation between playing violent video games and aggressive tendencies. However, there was no substantial link, or at least not enough evidence for one, between video game violence and increased committing of actual violent crimes. The gamers were more prone to complete sentences to violent meanings, and were less emotionally reactive, but did not seem to commit more crimes (Appelbaum 2015). Sex robots and allowing us to treat them as we wish, it seems, could increase our desire to have rough sex or rape play, but would likely not directly cause people to have rougher sex with their spouses, or go out and rape someone.

Having an outlet could even mean a safer sex life for the partner who is otherwise uninclined to be treated like an object. Yes, the behavior itself does remain condoned, even promoted; and if the spouse grows jealous, perhaps they may be subtly forced toward submission and objectification. However, I personally believe these are case-by-case matters that couples need to figure out before buying or renting a sex robot, or letting one another go to robo-brothels, and I do not believe governments should enforce laws that prevent robot rights violations for the near future.

To help mitigate brutish behavior toward fellow humans, though, advertisements and containers of sex robots could contain disclaimers that stress the difference between allowable

actions on sex robots versus on fellow humans. John Sullins (Ph.D. in the Philosophy of Science and Technology from Binghamton University) even suggested law-enforced built-in imperfections in software to allow users to more clearly distinguish between robots and humans (Sullins 2012). But such measures could stifle the effectiveness of robo-brothels, which reduce its potential prostitution reduction effects. And how would we even enforce laws on mandatory imperfections? It creates so much gray area. I guess the most feasible implementation is but a guideline saying, essentially, that robots shouldn't say, "I love you," or, "I love it when you do [xxx]," and instead, "My software tells me to elicit positive affective response by saying, 'I love you.'" But then would that extend to robot pets being banned from showing faux-affection like it's genuine? Is lying illegal? Just some things to consider.

Crime Containment, Rehabilitation, and Therapy

If you think abusive actions and thoughts are inherently wrong and follow deontological (duty-based) ethics, you would not condone public use of sex robots at all. But perhaps you may support using sex robots in rehabilitation programs aimed at correcting abusive behavior.

A common pro-sexbot argument: Sex robots can prevent rape, contain pedophilia and help rehabilitate sex offenders. Proponents argue that instead of raping children or other people, people with a propensity to rape can instead exert dominance over sex robots. Rapist and serial killer Jeffrey Dahmer said that he would have stopped killing people if he had a sex zombie (he tried to lobotomize victims to produce this effect) (Worthington 1992), a role a sex robot could perhaps have filled. This is but one anecdotal case, but it demonstrates plausibility.

With yet no solid empirical evidence to support or refute this claim, we turn to a moralistic discussion. Even with inconclusive evidence, should we still criminalize sex robot

rape (that is, using sex robots to simulate non-consensual sex and/or having intercourse with child sex robots)? Do you think the law should interfere on moral grounds just because something is, as considered by society, morally repugnant (like simulated rape) even though it causes no direct physical harm to anyone? I believe the law should avoid issues of individuals' morals where nobody else is hurt, but you can read more on moralistic vs. a-moralistic law. But even if you believe using sex robots warrants punishment, criminalization probably won't work. Alcohol, for example, with demonstrable, physical negative impacts is legal, since prohibition failed. The war on drugs is failed. So perhaps sex robots should be, like alcohol and cigarettes, sin-taxed, in order to emphasize its moral inappropriateness and possible societal harms, without creating large black markets.

Sexbots could also, like drugs, assist in therapy. We could program sex robots to gently introduce the concept of consent to patients of rape rehabilitation, and let patients practice using the sex robots. This discussion could lead on toward whether we should treat criminals or treat them like scum, which goes to show how far sex robots reach. Even those of us who may never touch a sex robot need to chip in our two cents or at least know a little since their effects range from education to crime to morality to humanity and traditionally taboo, fringe topics like compulsive behavior, which have everything to do with society's reception or marginalization. Modern theories of addiction suggest compulsiveness comes not mainly from the chemical itself, but rather the "cage" of the users—if they are kept lonely, with only the drug as solace, addiction happens, but, with social support, it can be mitigated (Kurzgesagt 2015). I thus urge you, even if you disagree with using sex robots, to remember to not demonize users.

Sex robots can also fill the supply-deficient medical sex worker market, relieving more physically disabled people of their sexual stress. Far future robots can be fully functional and

have closely simulated sex with patients. In the meantime, specialized masturbation machines, like an artificial vagina or phallus attached to a mechanical arm that repeatedly goes up and down or back and forth, or a fellatio, cunnilingus or otherwise sexually stimulating machine can help and, in some places, are already helping medical sex workers extract ejaculate or service patients ("Sperm Extractor Helps Patients Overcome Embarrassment" 2014). For now, virtual reality headsets augment the experience, but such machines will evolve into humanoid forms that eliminate the need for VR. Sex robots could also improve sexual experiences since medical sex workers don't perform vaginal sex, while sex robots can closely simulate it. Though these robots and medical sex workers are somewhat like prostitutes, the moral arguments against are weaker here since the patients are, well, disabled.

Easy Gratification

My earlier point about spouses not being able to satisfy their partners wishes extends to: What if sex robots completely replace relationships? Although as readers of today, we may think of sex robots as either an addition or niche product, kids today who grow up immersed in technology, with robot pets and soon perhaps robot butlers could turn, in their adult life, to robots for less emotional baggage and easy gratification. The complete replacement issue (and the accompanying population decline issue) probably pertains to a period perhaps 30 or more years away. But, for those more open to sex robots—those busy businessmen and anime addicts—even this coming decade's sex dolls with AI may exacerbate their problem of instant gratification, a problem that could hurt productivity through lower "academic success, physical health, psychological health, and social competence" ("Delayed Gratification" 2016). Then

again, less time 'wasted' on building real relationships could mean more time for work, but it does sound quite sad.

Furthermore, as Richardson claims, and I believe many would agree with, "only when confronted with another human can we experience our humanity, our identity, and our mutuality […]" (Richardson 2016). Having such easy avenues to sexual pleasure and access to 'ideal'-looking sexbots (robots' looks can be custom designed) could lead to us losing part of our humanity. Like the video gamers, sex robot users may lose emotional sensitivity. Socially awkward users may never improve their social skills since there is no need to for finding a sexual partner; they may even shy off from society more. In creating robots more and more like us, yet devoid human needs, we may converge toward them—grow more and more robotic.

A You-bot?

This point didn't quite fit anywhere, but I felt it needed addressing: What about sex robots that look like certain celebrities (or other people)? I would be flattered if someone were to create a sex robot of my likeness; others, perhaps vexed or otherwise unhappy. Stalkers could act out their fantasies on robot versions of their idols, which relates back to the point about condoning behavior and preventing crime. But if a person condemns creating robot/doll replicas of themselves, do they have legal power to prevent, or earn royalties from, production? Current US laws seem to handle cases where one's likeness is used without consent on a case-by-case basis ("Using the Name or Likeness of Another | Digital Media Law Project" 2014), but as the sexbot market grows, this legal gray area will need more explicit standards.

The same rights issues apply to anime characters, but I suspect a simpler here. I'm guessing the original artist and publishing firm would get paid royalty fees. But what about

characters inspired by real people, or sex robots based on actors who portrayed certain characters on film? Again, the issues surrounding sex robots span so wide.

Literary and Futuristic Note

Most stories regarding sex robots, especially female robots, since most writers of these sexbot stories were men, end with them malfunctioning or otherwise acting improperly (Kang 2005). A 21st-century movie "Ex Machina" also continued this archetype, with its main fembot killing her creator and trapping the person she fooled into helping her. Kang noted the "subversive potential" of these stories. One could twist them into an agenda like, "oh look, see, sex robots are bad for humanity." However, Kang also notes that the sources of such negative endings generally arose from the questioning and blurring of traditional "dualities." Life/death, man/woman, controller/controlled (some of these robots turned out to manipulate the people, and indeed sexbot AIs can be programmed to target certain human reactions like evoking affection by saying "I love you" and thus, in a way, manipulate people). Add that the stories were mostly written post world war, with technophobic zeitgeist, and people's general fear of change, and naturally, we have stories with bad endings.

Progressives will point out that ascribing men and women and different races to have equal rights and ending slavery, historically regarded as ridiculous, advances our society. Perhaps the natural next step, then, is to give robots, at least the intelligent and anthropomorphic kind of the farther future, similar rights. Maybe 50 years from now, my grandkids will look back at the early 2010s and point out what savages we were in working our machines like slaves. Giving robots rights could also prevent those doomsday scenarios studied by Kang. Note that Ex Machina, and several of the stories Kang mentioned, had a dynamic of the creator owning the

robots. The robots were regarded as inferior, sub-human, and lacked rights. They learned from their masters' inappropriate actions, so of course these repressed robots revolted!

Alternatively, we could hard-code morality. That brings a further lot of complexities, though, and existing frameworks like sci-fi writer Isaac Asimov's three laws for robots likely (my addition) "can't protect us" (Dvorsky 2014). We may just have to train them with data that maps situations into 'morally correct' actions, in part by treating them right.

Conclusion, Disclaimer, and Plea

In case you have not noticed, let me point out very clearly, in one of my few absolute sentences: Most of my claims are borrowed and tentative. For proper legislation and clear answers to most questions this paper posed, we will have to wait for the robots to come to collect and analyze empirical data. However, bearing in mind the questions and some of the many considerations should help us handle and process their arrival in a more informed, directed manner. For now, I don't think governments should create laws that stifle sexbot development or assign them rights, but they definitely need to promote research on their consequences.

I hope my paper has introduced some of the intricacies associated with these love machines of the near present. Please think about it; discuss; and, as Aviva Rutkin—writer for the New Scientist who "[explores] the minds of intelligent machines and how we live with them" — notes, don't let their taboo nature or your visceral reactions hamper study on this subject (Rutkin 2016). Only through conversation, research and thought have we as a species rose above others, and through conversation, research and thought will we best face the future.

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