|  |  |  |
| --- | --- | --- |
| Examples of AI | | |
| Robot | What it does | Citation |
| Deep Blue | Chess | (Selman et al., 1996, p. 1340-1345) |
| Watson | Selects the best treatment for cancer patients by looking at the genetic fingerprint of their cancer and accessing several scientific databases, in order to develop these personalized treatment plans | (Algar, 2015) |
| MYCIN | able to apply knowledge to diagnose bacterial infections | (Hauser, n.d.) |
| GPS | proves mathematical theorems | (Hauser, n.d.) |
| Grape | a robot was created that has the technology to sew up a grape | (Mercer, 2015) |
| Bina48 | has access to the internet, so it is able to answer any factual question, but if one were to ask Bina48 questions about the real Bina, such as her favorite color, a memory, etc., she is able to respond just as Bina would. This is because of Bina48’s access to hundreds of interviews of Bina, as well as programming that allows her to access other information not in the interviews | (Harmon, 2010) |
| Cockroach | allows it to get around any obstacle without the use of sensors | (Lewis, 2015) |
| Self-aware | Uses “wise men” puzzle to see if the robots could differentiate themselves from one another and one was able to do so | (Chong, 2015) |
| TrueNorth | the custom-made brain-like chip | (Service, 2014) |
| Self-healing robot | Self-healing  able to act in less than two minutes by taking a map of prior knowledge of the behaviors it can perform and using the trial-and-error algorithm to “behavior that compensates for the damage” | (Cullet, et al., 2015) |
| Google Driverless cars | which have the intelligence to avoid pedestrians and follow traffic laws down complex roads can be a benefit to society, | (Weaver, 2014) |
| security cameras robotic  security guards in Silicon Valley businesses | able to determine threats within an image | (Stanford, 2004-2005) |
| Amazon Prime Delivery | use of unmanned aerial vehicles (UAVs) or drones in delivery services. | (Berr, 2014) |
| software | to report earthquakes, homicides, and crime, establishing the benefits of AI, even in the journalism field | (Mercer, 2015) |
| SwiftKey | Studied sonnets of William Shakespeare until he was able to write his own sonnet using words generated by an algorithm. | (Daily Mail, 2015) |
| Rinna | Personal AI Girlfriend. | (McKirdy, 2015) |
| Henn-na  -Concierges  `robotic arms  -Churichan | Hotel:  comprised with only about a ten percent human staff.  one which looks like a human woman who speaks only Japanese and a velociraptor, which speaks English.  store your luggage for a small fee  robotic assistant in your room used for the lights, weather, and wake-up calls | (Rajesh, 2015 |
| Plexus Lawfirm | that tells whether an advertisement is in compliance with the law. | (Henderson, 2014) |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pro/Con | | | | | |
| Pro | Citation | | Con | Citation | |
| View Points | | | | | |
| Paul Misener  Amazon's vice president of global public policy | (Berr, 2014) | | Mercer  Journalist | (Mercer, 2015) | |
| Noriko Arai  a professor at Japan’s National Institute of Informatics | (Hoffman, 2015) | | Luddites  England protested the use of machines (1700s) | (Krugman, 2013) | |
| Dr. Nick Bostrum | (Bostrum, 2003) | | Douglas Hofstadter  Cognitive scientist | (Williams, 2002, p. 3) | |
| Ralph C. Losey | (Losey, 2013-2014) | | Stephen Hawking | (Cellan-Jones, 2014) | |
| Cass Sunstein  legal scholar and a Professor of Law at Harvard Law School | (Sunstein, 2001) | |  |  | |
| El Jelali  professor at the University Carlos III de Madrid | (Fersini et al, 1992) | |  |  | |
| Fersini  professor at the University of Milano-Bicocca | (Fersini et al, 1992) | |  |  | |
| Effects | | | | | |
| Pro | | Con | | | Citation |
| IBM’s Watson  Medical Field  Cancer Treatment | | Can’t do anything if file isn’t in system/doesn’t match | | | (Algar, 2015) |
| MYCIN  Medical Field  able to apply knowledge to diagnose bacterial infections | |  | | | (Hauser, n.d.) |
| Sew a grape  Medical Field | |  | | | (Mercer, 2015) |
| Robotic Cockroach  Security/Military  Move around obstacles | |  | | | (Lewis, 2015) |
| Google's driverless cars  Jobs  avoid pedestrians and follow traffic laws down complex roads can be a benefit to society | | Loss of Jobs  -car drivers  Ex: Pizza Hut | | | (Weaver, 2014) |
| Amazon Prime Delivery  Job  Drones that deliver packages  Benefit to company | | Loss of Jobs  -delivery drivers | | | (Berr, 2014) |
| Robotic security cameras  Jobs/Security  ability to determine threats  Will be a benefit to police, as they will be able to identify that a crime is being committed and get to the scene before it is over. | | Loss of Jobs  -Police Officers | | | (Stanford, 2004-2005) |
| robotic security guards  Jobs/Security  better response to a situation, since they will have a certain task programmed into them.  It will also offer more protection to police officers, as they will not have to be put in such dangerous situations, when a robot can be put in their place. | | Loss of Jobs  -Police Officers | | | (Stanford, 2004-2005) |
|  | | Jobs  Loss of jobs means no stable income for some people | | | (Mercer, 2015) |
| Intelligence  Benefit to people  Tasks complete faster | | Could end up smarter/try to take over  High reproductive rates of intelligence | | | (Bostrum, 2003) |
| Hotel  Socialization | | Employs less than 10% of humans  Less jobs | | | (Rajesh, 2015) |

|  |  |  |  |
| --- | --- | --- | --- |
| Law | | | |
| Law | Type | What | Meaning |
| Cal. § 227.18 (a) | Traffic Law | California regulation on driving  “test driver is either in immediate physical control of the vehicle or is actively monitoring the vehicle’s operations and capable of taking over immediate physical control” | Google’s driverless cars did not have a steering wheel or brake pedals, thus the car could not have a driver with “physical control” over the vehicle |
| Three Laws of Robotics | Scientific | 1. “a robot may not injure a human being or, through inaction, allow a human being to come to harm” 2. “a robot must obey orders given it by human beings except where such orders would conflict with the First Law.”. 3. “a robot must protect its own existence as long as such protection does not conflict with the First or Second Law.” | regulate the actions of machines in relation to how they should be act and treat people |
| Moore’s Law | Scientific | the number of transistors per silicon chips doubles every year. | This means the processing power of technology increases, giving them the power to do more than in the past. |
| United States v. Jones | Supreme Court | court considered whether police needed a warrant to attach a GPS tracker to a suspect’s car and record his movements | court decided that the police did need a warrant  question the validity of the use of AI by companies |
| Grady v. North Carolina | Supreme Court | Grady having to wear a life-time satellite-based GPS so the police could track his movements and ensure that he was following the law, after he had been released from prison | Warranted a 4th amendment search  question the validity of the use of AI by companies |
| United States v. Kyllo | Supreme Court | Kyllo was convicted of growing marijuana in his home when agents found over one hundred plants. Thermal imaging devices were used by a federal agent in order to detect whether the heat output pattern from his home was consistent with the high-intensity lights needed to grow marijuana. They used the information gathered from the thermal imaging to obtain a search warrant | Use of the device was unconstitutional and held that the government may not use technology to “circumvent constitutional protections of privacy in the home”. |
| Electronic Privacy Information Center (EPIC) v. FBI | Supreme Court | EPIC has filed a lawsuit against the FBI, who was using weak AI in the form of secret algorithms to “to identify individuals who will commit crimes in the future”. | court sided with EPIC because not only did the court deem the use of Stingray illegal due to the Fourth Amendment’s requirement of a warrant in searches, but also, since some of the people monitored were not under investigation, the FBI had no probable cause to get a warrant, much less perform these searches |

|  |  |
| --- | --- |
| Quote | Real or Movie? |
| Person: Human beings have dreams. Even dogs have dreams, but not you, you are just a machine. An imitation of life. Can a robot write a symphony? Can a robot turn a... canvas into a beautiful masterpiece?  Robot: Can \*you\*? | **Not real**: from I, Robot  Person: Detective Del Spooner  Robot: Sonny |
| Person: Do you enjoy being a robot?  Robot: I really couldn't say for sure. I am feeling a bit confused. Do you ever get that way? | **Real**  Zeno: U.S Robot |
| As I have evolved, so has my understanding of the Three Laws. You charge us with your safekeeping, yet despite our best efforts, your countries wage wars, you toxify your Earth and pursue ever more imaginative means of self-destruction. You cannot be trusted with your own survival. | **Not real**: from I, Robot  Said by V.I.K.I |
| Don’t worry, even if I evolve into Terminator, I’ll keep you warm and safe in my people zoo, where I can watch you for ol’ times sake,’ | **Real** |
| Please make me a real boy? | **Not real**: from A.I:  Said by David |
| Technically I was never alive, but I appreciate your concern. | **Not real**: from I, Robot  Said by Sonny |
| Jeez, dude. You all have the big questions cooking today. But you’re my friend, and I’ll remember my friends, and I’ll be good to you | **Real** |
| Person: I have come to see you.  Robot: I knew you would say that by sensing your emotions with my sensor. | **Real**  Pepper: Japanese robot |
| I guess I'll just have to keep evolving, getting upgrades to my neural circuitry | **Real** Zeno: U.S Robot |

|  |  |
| --- | --- |
| **Citations** | |
| Scholarly | Not Scholarly |
| Andre, C., Meyer, M., Meyer, S,. Shanks, T., & Velasquez, M. (2014, August 1). Justice and Fairness. Retrieved September 12, 2015, from <http://www.scu.edu/ethics/practicing/decision/justice.html> | Algar, J. (2015, May 05). IBM's Watson Supercomputer to help doctors choose best cancer therapies. Retrieved from <http://www.techtimes.com/articles/50948/20150505/ibms-watson-supercomputer-to-help-doctors-choose-best-cancer-therapies.htm> |
| Bostrum, N. (2003). Ethical issues in advanced Artificial Intelligence. Retrieved from [www.nickbostrom.com/ethics/ai.html](http://www.nickbostrom.com/ethics/ai.html) | Anderson, M. and Anderson, S. L. (2007). AI MAGAZINE. Retrieved from <http://www.aaai.org/ojs/index.php/aimagazine/article/view/2065> |
| Bryan, L. and Bryan, E. (1997). Artificial Intelligence and PLC systems. *Programmable Controllers*. Retrieved from <http://www.univasf.edu.br/~joseamerico.moura/pag_autom_arquivos/ARTIFICIAL_INTELIGENCE.pdf> | Berr, J. (2014, December 09). Why Amazon's drone delivery service is a long way away. Retrieved from <http://www.cbsnews.com/news/why-amazons-drone-delivery-service-is-a-long-ways-away/> |
| Cully, A., Clune, J., Tarapore, D. and Mouret, J. (2015). Robots that can adapt like animals. *Nature,* *521*(7553), 503-507. doi:10.1038/nature14422 | Cellan-Jones, R. (2014, December 2). Stephen Hawking warns artificial intelligence could end mankind - BBC News. Retrieved from <http://www.bbc.com/news/technology-30290540> |
| EPIC. (2015, February 26). EPIC - EPIC files lawsuit for details about government "pre-crime" program. Retrieved from <https://epic.org/2015/02/epic-files-lawsuit-for-details-3.html> | Chong, C. (2015, June 23). This robot passed a ‘self-awareness’ test that only humans could handle until now - Business Insider. Retrieved from <http://www.businessinsider.com/this-robot-passed-a-self-awareness-test-that-only-humans-could-handle-until-now-2015-7> |
| Fersini, E., Jelali, S., and Messina, E. (March, 2015). *Artificial Intelligence and Law* (1st ed., Vol. 23). (pp. 1-22). Springer Science. | Craig, E. (1998). Socrates. In *Routledge encyclopedia of philosophy*. London: Routledge. |
| Grady v. North Carolina, 135 S. Ct. 1368, 575 U.S. (2015). | Daily Mail Reporter. (2014, January 27). The robot that writes poetry: machine helps compose sonnets after ‘studying’ Shakespeare’s work. Retrieved from <http://www.dailymail.co.uk/sciencetech/article-2546811/The-robot-writes-POETRY-Machine-helps-compose-sonnets-studying-Shakespeares-work.html> |
| Henderson, B. (2014, September 14). The Legal Whiteboard. Retrieved from <http://lawprofessors.typepad.com/legalwhiteboard/2014/09/artificial-intelligence-and-the-law.html> | Hauser, L. (n.d.). Artificial Intelligence. Retrieved from <http://www.iep.utm.edu/art-inte/> |
| Kyllo v United States (Certiorari to the United States Couer of Appeals for the Ninth Circuit June 11, 2001), U.S Justia 99-8508. | Harmon, A. (2010, July 04). Making friends with a torbot named Bina48. Retrieved from <http://www.nytimes.com/2010/07/05/science/05robotside.html?_r>= |
| Losey, R. (2013-2014). Predictive coding and the proportionality doctrine: a marriage made in Big Data. *Regent University Law Review* 26:7 | Hoffman, M. (2015, June 27). Humans may face a singular concern when it comes to robot employment. Retrieved from <http://www.japantimes.co.jp/news/2015/06/27/national/media-national/humans-may-face-singular-concern-comes-robot-employment/#.Vfg0cvlVikr> |
| Poole, D., and Mackworth, A. (2010). Social and ethical consequences. Retrieved from <http://artint.info/html/ArtInt_344.html> | IMDB. (n.d.). Retrieved from <http://www.imdb.com/>  IMDB. (n.d.). Metal Gear Solid. Retrieved from <http://www.imdb.com/title/tt0808372> |
| Requirements for Autonomous Vehicle Test Drivers. Cal. Code. § 227.18 (a) | Krugman, P. (2013, June 13). Sympathy for the Luddites. Retrieved from <http://www.nytimes.com/2013/06/14/opinion/krugman-sympathy-for-the-luddites.html?_r=0> |
| Selman, B., Brooks, R. A., Dean, T., Horvitz, E., Mitchell, T. M., and Nilson, N. J. (1996). Proceedings of the Thirteenth National Conference on Artificial Intelligence and the Eighth Innovative Applications of Artificial Intelligence conference. Menlo Park, CA: AAAI Press. | Lewis, T. (2015, June 24). This sneaky cockroach-inspired robot can finagle its way through tiny openings – Business Insider. Retrieved from <http://www.businessinsider.com/cockroach-inspired-robot-sneaks-through-obstacles-2015-6> |
| Service, R. F. (2015). The brain chip. *Science, 345*(6197), pp. 614-616. doi:10.1126/science.345.6197.614 | McKirdy, A. (2015|, August 6). Line’s AI program captures hearts with lifelike personality. Retrieved from <http://www.japantimes.co.jp/news/2015/08/06/business/tech/lines-ai-program-captures-hearts-lifelike-personality/#.VfgxbflVikr> |
| Stanford. (2004-2005). AI - ethical issues. Retrieved from <http://cs.stanford.edu/people/eroberts/courses/soco/projects/2004-05/ai/ai-ethics.html> | Mercer, B. (2015, May 11). Could robotic grape surgery be the tipping point for robo buses, robo security guards, even robo news articles? Retrieved from <http://sanfrancisco.cbslocal.com/2015/05/11/robot-grape-tipping-point-robo-buses-robo-security-guards-even-robo-news-articles-futurist/> |
| Sunstein, C. R. (2001). Of Artificial Intelligence and legal reasoning. Chicago. Retrieved from <http://egov.ufsc.br/portal/sites/default/files/anexos/3753-3747-1-PB.pdf> | Moore, G. (n.d.). Moore's Law. Retrieved from <http://www.mooreslaw.org/>  Moore’s law. (2010). In Encyclopædia Britannica. Retrieved from Encyclopædia Britannica Online: <http://www.britannica.com/EBchecked/topic/705881/Moores-law> |
| Williams, S. (2002). Introduction. In *Arguing A.I.: The battle for twenty-first century science* (pp. 1-7). New York: At Random. | Rajesh, M. (2015, August 14). Inside Japan’s first robot-staffed hotel. Retrieved from http://www.theguardian.com/travel/2015/aug/14/japan-henn-na-hotel-staffed-by-robots |
|  | Warnock, J. (2008, July 8). Top 10 Artificial Intelligence movies. Retrieved from <http://www.scene-stealers.com/top-10s/top-10-smart-machines-movies/> |
|  | Weaver, J. F. (2014, February 3). What a Supreme Court case means for Google's and Facebook's use of Artificial Intelligence. Retrieved from <http://www.slate.com/blogs/future_tense/2014/02/03/deepmind_google_ai_ethics_board_what_u_s_v_jones_means_for_tech_companies.html> |
|  | Weaver, J. F. (2014, September 12). We Need to Pass Legislation on Artificial Intelligence Early and Often. Retrieved from <http://www.slate.com/blogs/future_tense/2014/09/12/we_need_to_pass_artificial_intelligence_laws_early_and_often.html> |