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General AI Identity Variable

In 1936 Alan Turing, a prominent scientist from the National Physics Laboratory, started work on a machine known as the Universal Turing Machine. This has been frequently referred to as the precursor to the modern day computer. It was this machine that was the first scene of smoke that would become the raging fire of technology that consumes today. Technology through the turn of the century has advanced at a pace so rapid it is hard to keep up, and it is only accelerating. Mobile phones, microcomputers, virtual reality; all of these have the opportunity change the world as we know it but what will have the greatest impact is undoubtedly how we use software to power these devices. Having a device present information when you ask instead of having to tap, helping with automation, manufacturing, creativity, anything that involves a problem and a solution can be solved with software. Consequently it could be said that the most important tool humanity could create is software that can build itself and other versions of itself...automate the automation. This is simply referred to as Artificial Intelligence, and it will be the single most fundamental change our world will undergo. In fact, the advancement and application of a general Artificial Intelligence is necessary to further humankind’s understanding of themselves, the natural world around them, and the evolution of homosapiens as a species regardless of the ethical concerns surrounding Artificial Intelligence.

A calling card of homosapiens is our ability to adapt to new environments and learn skills necessary to survive, and in turn pass those skills to our offspring. Considered an “apex” predator, humanity had become so used to being so superior we put blinders to the idea that we might not be the penultimate version of ourselves. As we grow smarter and smarter, humanity has begun to understand it is a means for the universe to understand itself but only to a point. You see, the brain is very fast but not necessarily powerful. The brain just happens to be unbelievably efficient at processing and pattern recognition which makes homosapiens unique. What separates a computer from the human body is a human's ability to feel emotion and pain. The brain has ways of creating feeling that a computer simply can’t do...yet. Once a computer is able to mimic a brain and can feel pain and emotion it could be considered a human. Alan Turing came up with a series of questions and tests for this exact same thing which is now known as the Turing Test. The Turing Test was designed to help define what makes a human human, and how that unique feature can be exploited and used for testing purposes. The basic premise behind the Turing Test is that an AI or Robot, when asked a series of question by a random interviewee, is then assessed on the answers they give. If the interviewee cannot tell if the robot or AI is human or not, then the machine passes that Turing Test, or in other words can fool human psyche. The Turing Test could also be humanity's greatest attempt at solving consciousness. Once we can replicate consciousness in machines and make it even better, we can go the other way around. Cyborg anyone?

Nowadays lasers can correct vision, cars drive themselves, and coffee is served in “pods”. As technology races faster and faster and our attention grows closer and closer to the new devices, we lose our sense of space and time. It wasn’t more than 20 years ago that I used my first computer ever and now we have a supercomputer in my pocket. This rapid pace tends to scare away many, but it should excite humanity in regards to AI. Artificial Intelligence is poised to allow use to expand the power of our brains even further than previously thought. I am referring to of course, bioinformatics. Bioinformatics is the study of biology and its relevant information using technology as a primary tool. Imagine having nanobots in your body controlled by an AI in your home who monitors your vital signs. When something is amiss and homeostasis is interrupted, the AI instructs the nanobots to repair the damage. This level of advanced connectivity can be achieved through AI and data collection within the human body. In the future, when you visit a doctor it won’t really be a doctor. It will be a robot designed to function like a doctor and uses various built-in scanners and devices to take stock of its patients. It can tell your fever, white blood cell count, and many other benchmarks just by looking at you. Wouldn’t all of this innovation hurt the job market though? In a classic sense yes, but with a little ingenuity and bravery, no. With the absence of minor jobs and manufacturing positions, the only jobs available will be jobs that are either highly skilled or highly technical. With all of this newfound time and hopefully some sort of basic income, humanity will be smarter and more free than ever before. Following your passion will once again become a valid dream as simple time consuming things in your life are slowly replaced by machines.

In addition to being extremely smart and adaptive, humans also tend to be (unfortunately) very short-sighted. As we began to release our technology during the industrial revolution the environment around us began to change. The first changes we noticed were roadways being made, new materials being created, and lives generally improving. It wasn’t until the early 2000’s that we realized the environment around us was being destroyed by our ignorance and inability to overcome our short sightedness. As technology began to progress more and more and science exploited some secrets of the world, we began to understand that we could use other means to gather our energy and hopefully turn around climate change. Although we are still in the process of doing so, I have high hopes for how the strengths of AI can help tackle these serious issues. AI is great at streamlining processes that take information in and spit information out. This is essentially any industry in the world, and as such every industry stands to benefit from AI. These issues are so intertwined that companies have been created to not only tackle these software AI engines, but also to carry them over to other divisions in their company and use the AI there to improve those sectors. Put simply, AI has an ability to think and problem-solve complex quandaries than humanity simply doesn’t have the time to solve. This acceleration combined with technology will change the way the world works as we know it in the next 10 years.

The world is destined to embrace artificial intelligence as its next great advance. Not only will it allow humans to understand ourselves and the world better, it will act as the sort of catalyst for evolution to something potentially even greater. All of the heady ideas we have regarding alternate dimensions, the existence of God, multiverse theory, etc….All of these can be advanced and realized with AI. In addition, an artificial intelligence can help in specific sectors such as healthcare, manufacturing, customer service, the options are really limitless. As scary as a future like this seems, it is part of a crossroad for humanity that is necessary. One of the greatest dangers humanity has is itself, and AI is a polarizing idea, but it has many more pros than cons and much like the computer before it AI will change the world regardless of its ethical concerns.

**M.L.A. citation:**

Wallach, Wendell, and Colin Allen. “Moral machines: teaching robots right from wrong.” Oxford University Press, 2009. Retrieved Feb. 10th, 2018 from Albertsons Library.

**C.R.A.A.P. Analysis:**

* **Currency**: Published 2009. Although this source is fairly old, it is still within the advent of mobile technology and advancements in Artificial Intelligence. AI has been modernized since the early 2000’s to include ethics, which this book is addressing in part.
* **Relevance**: This source supported my thesis by illustrating both the challenges and shortcomings of having humans “dump” their conscious values into a machine. A fundamental problem with an AI’s ethics are the determination of ethics. Should they be controlled by humans, or self imposed by the machine itself?
* **Authority**: Colin Allen has both a B.A. in Philosophy from the College of London as well as a P.h.D. in Philosophy from UCLA. He has worked on the philosophy of machines and morality for nearly 30 years. His main focus currently is cognitive science, but he has written over 10 scholarly articles pertaining to machines and morality.
* **Accuracy**: As difficult as testing morality on a machine is, there are a select few disciplines that help in these challenges. Primarily this book discusses the responsibility of Engineers to “hold paramount the safety, health, and welfare of the general public.” and the disciplines responsibility to expand upon not how we apply consciousness to machines, but rather should we. This fits in line well with my thesis as the ethics of such a task are always at question.

**Purpose**: The author’s main purpose was to illustrate that ethics in machinery and robotics are no longer just conjecture. We are approaching real crossroads that need to be defined and weighed before humanity approaches them. In the past, such robotic and software advances were told as stories of the future. There is a sense of urgency in this book to address ethics before it is too late.

**M.L.A. citation:**

Lynch, Gary. Granger, Richard. “*Big Brain: The Origins and Future of Human Intelligence*”. New York: Palgrave Macmillan (2008). Retrieved Mar. 2.

**C.R.A.A.P. Analysis:**

* **Currency**: Published in 2008, this book analyzes the past and potential future of our brains development. As it attempts to address current computer technologies and their effect on computational brains, having a source that uses somewhat modern technologies is crucial. 2008 is current enough to address the past and can predict some portion of the future although resources below are much more current to back up future predictions.
* **Relevance**: In particular to my presentation this book is very relevant as it explores one of the most controversial points in creating an AI. Primarily, the idea that machines with take over humanity and be “everything humanity is and more”. This idea can be very scary so it's nice to have a book that can explore the technological challenges that come along with this idea.
* **Authority**: Both authors in this book are seasoned scientists. Gary Lynch is a professor at the University of California, Irvine. He is the author of more than 550 scientific publications that are among the most cited in the field of neuroscience. Richard Granger is a W.H. Neukom Distinguished Professor of Computational Science and of Psychological and Brain Sciences at Dartmouth. He has made contributions to numerous FDA drugs as well as being a consultant for large Fortune 500 companies. Particularly regarding the brain, both of these authors are well versed.
* **Accuracy**: Being a scientifically based book, it seems to be very accurate. In a few pages they mention the bodies ability to implement chemical systems to have motion and other unique aspects of humans. In addition, the authors in relation to this book have PhD’s is fields related to psychology and anatomy which adds to authority.
* **Purpose**: The purpose of this book is to address the innate ability for the human brain to advance and become something new in quick iteration. The book spends quite a bit of time taking stock of the past status of homosapiens and how we came to be as “relatively” smart as we are now. Throwing in a little computational robotic ability also shows how humans may be different than we’ve ever been in the future, which supports my thesis.

**M.L.A. citation:**

James Kennedy, and Russell C. Eberhart. “Swarm Intelligence” Morgan Kaufmann, 2001. Retrieved Mar. 10th, 2018 from Albertsons Library.

**C.R.A.A.P. Analysis:**

* **Currency**: Published in 2001, this book was published right around the time larger companies and data mining started to surface. Although Google would not become a large presence for another few years, there were specialized companies that are interested in collecting data. This started the advent of the idea that all data everywhere is a good approach to futurizing technology. Swarm Intelligence is reliant on this technology.
* **Relevance**: Obviously swarm intelligence is quite relevant to artificial intelligence. As an example, when a Tesla goes around a corner in autopilot it can adjust how it takes the turn based on how previous Tesla cars took that corner. A hivemind of learning is almost essential to a proper AI and Swarm Intelligence si the basis of this.
* **Authority**: James Kennedy and Russell Eberhart are both experienced in the field of machine learning. Both also have PhD’s in engineering or electrical related fields. On top of numerous publishings between the two, they are also core inventors of a particle physics simulation algorithm.
* **Accuracy**: I have not fully read this text as it is fairly large, but it does try to predict some future occurrences and timelines that aren’t quite accurate. For example, a bevy of flying cars that communicate together was proposed by one of the authors by 2020, and obviously that isn’t the case just yet. In terms of how swarm technology works nowadays however, not much has changed so using this information should help.

**Purpose**: The main purpose of this book is to help describe why we might want a swarm intelligence to begin with. In addition it helps describe how we might employ swarm intelligence from the tiniest of examples all the way to controlling our traffic and even the behavior of a group of people.

**M.L.A. citation:**

Blay Whitby. “A Beginners Guide: Artificial Intelligence” Oneworld Publications, 2003. Retrieved Feb. 12th, 2018 from Albertsons Library.

**C.R.A.A.P. Analysis:**

* **Currency**: Published 2003. Being an older resource, I am not relying on this book for accurate AI information, more as a history of AI and how it became about in the early days.
* **Relevance**: This source became more relevant as I started to read further. I thought being such a short book it would just talk about the basics of what AI is, but instead I found it had a lot of predictive information as to how AI technologies might be applied in the near future and how pervasive it will become.
* **Authority**: Blay Whitby has PhD specifically in the social implications of artificial intelligence. He is perhaps one of the worlds best authorities on how a generalized AI might affect the world which is pretty cool. He is based out of the UK, and has been studying AI for nearly 40 years.
* **Accuracy**: This book has been less than accurate as it tries to be predictive of AI breakthroughs. In some ways we have had breakthroughs, but largely we have not exceeded expectations in AI. Whitby at one point believes a combination of humanity and information will occur, basically insinuating cyborgs. Whether this happens or not is unclear, but accuracy doesn’t seem to be the point of this book.

**Purpose**: The purpose of this book is to take a look at how such tiny changes in technology can fundamentally change the way we behave. If we no longer have to worry about producing food, or watching traffic, or even grabbing a coffee, how might society shape and morph? Will we become more lazy, or more driven? As deep as these ethical concerns can be, this book does a good job or raising questions and making the reader think.

**M.L.A. citation:**

Patrick Henry Winston. “Artificial Intelligence: Third Edition” Addison-Wesley Publishing Co., 1992. Retrieved Mar. 18th, 2018 from Albertsons Library.

**C.R.A.A.P. Analysis:**

* **Currency**: Published in 1992, this text was the oldest of all texts I CRAAP tested. The reason I chose this resource was because it had some great technical information, and is still being used at Harvard to this day.
* **Relevance**: In terms of my own technical nerd knowledge, this source is super relevant. It has given me a lot of technical information that will allow me to express my knowledge in my write-up and help me have a deep understanding of how an AI engine might work.
* **Authority**: Patrick Winston is a Professor of Computer Science at MIT. He has been teaching and doctoring for over 35 years, and has helped create the MIT AI lab as well as varying other programs on campus designed to tackle Artificial Intelligence. Being a proficient Computer Scientist has helped Patrick WInston create a technically in depth book that shows specific algorithms and processes behind AI, which has helped me narrow down my search for talking points.
* **Accuracy**: I may not be the best resource to judge the accuracy of this book as it is very technical, but from what I have been able to cross-reference the information seems accurate. I looked up one of the algorithms for image recognition and Google was able to confirm that similar if not the same algorithms are still being used today, over 20 years after the publication of the book.

**Purpose**: This book was created as a graduate level exploration of the processes behind an AI engine in varying fields. It provides a lot of textual examples of how an image might recognize a flower vs a dog, or how it could have language recognition and translation (that stuff was really cool). Although it was designed as a textbook, it shows some very cool formulas that when broken down actually make sense.

**M.L.A. citation:**

The Master Algorithm. (2018) *The Data Skeptic Podcast.* Available at:

<https://dataskeptic.com/blog/episodes/2018/the-master-algorithm> [Accessed 16 Mar. 2018].

**C.R.A.A.P. Analysis:**

* **Currency**: Being a podcast, the currency is pretty great. This podcast is released once a month, and the one I listened to was from this month (March).
* **Relevance**: This source is about as relevant as I could possibly get as it talks specifically about the most recent breakthroughs and impacts of AI. As more and more news is released it is easy to get enveloped in “fake” news about AI. In a lot of ways this stuff is released as click-bait or a way to get a specific story out there. Podcasts tend to filter these stories and only bring impactful news.
* **Authority**: Kyle Poloch is the interviewer for this podcast episode and he is very qualified having experienced software development through multiple jobs starting in the early 2000’s. The interviewee Pedro Domingos. Pedro has his own book related to AI and he has been writing about AI for over 15 years.
* **Accuracy**: There is less accuracy in this podcast than I would have expected as it seems to be related towards speculation of the future (a common theme with AI) as opposed to current advancement. I did notice both of the speakers were interested in how AI would change our search for information and its accuracy. In particular they discussed about Google’s search algorithms and how AI backends will simply need to be “trusted” for accurate information which could be a problem.

**Purpose**: The purpose of this podcast as a whole is to provide accurate up to date info regarding releases in the AI community, software updates, or hardware releases. In a lot of ways its a great “quick informant” as most of the episodes were shorter than 30 minutes.

**M.L.A. citation:**

DeepMind. (2018). *AlphaGo | DeepMind*. [online] Available at: https://deepmind.com/research/alphago/ [Accessed 13 Mar. 2018].

**C.R.A.A.P. Analysis:**

* **Currency**: Published 2017. This is one of the best sources to show how fair industry has come. It is about as current as possibly, and being a company in the forefront of AI can’t help either.
* **Relevance**: Potentially my most relevant source, DeepMind AI engines are what initially sparked my interest in AI. Their whole company's goal is to create a generalized AI that can handle most any task without the need for a crazy amount of computational resources and structuring. Seeing as this is seen as the quickest way to a generalized AI, DeepMind si at the forefront.
* **Authority**: Although this particular website doesn’t have a “publisher” they are owned and operated by Google, or Alphabet Inc. Being such a large company has its own trust issues, but when it comes to authority there is none better. Google has always been a king of information and you need information to create AI.
* **Accuracy**: The accuracy of this article has to be taken with a grain of salt. Although DeepMind is one of the best companies for generalized AI out there, it also has an agenda and that is to sell its brand. Plenty of other AI engines have had breakthroughs in different areas so it's not like DeepMind is the only authority in this realm.

**Purpose**: The purpose of this article is definitely to showcase what AlphaGo is as wella s their goal. About a year ago the AlphaGo engine was released once again to battle one of the best Go players in the world (some say he's the best). AlphaGo beat the player 4-0 convincingly and didn’t even “sweat”. The primary purpose of this article was to illustrate what DeepMind is doing with its AlphaGo AI engine, and to promote that.

**M.L.A. citation:**

TensorFlow 2018. *Getting Started with ML for Beginners|TensorFlow.* Available at:

https://www.tensorflow.org/get\_started/get\_started\_for\_beginners [Accessed 3 Mar. 2018].

**C.R.A.A.P. Analysis:**

* **Currency**: Published 2016. This was meant to be an introductory article for the programming language/library made by google for Machine Learning. It is documentation for coding so its is updated very frequently and is accurate.
* **Relevance**: This source has become the basis for how I explain machine learning to almost anyone. Google does a great job with their TensorFlow libraries at integrating them with other coding languages and workflows, but they also do a good job of describing the basics. The basics are exactly what I will need in order to explain succinctly about my topic.
* **Authority**: Once again this authority comes from perhaps THE authority on machine learning and informatics, Google/Alphabet Inc. This page was made specifically for TensorFlow, the language used by Google’s backends for language processing and image recognition.
* **Accuracy**: When it comes to coding, having accurate and up to date infor is crucial so there aren’t any incompatibilities with different software versions. It is for this reason that the info on TensorFlow is accurate and up to date. The last push to their website that I can find was less than a week ago, which tells me they are on top of their information.

**Purpose**: As somewhat stated before, the purpose of these libraries is to show how TensorFlow can be integrated in machine learning and how it can make machine learning both more enjoyable and productive. At some point companies will need to come together and decide on a coding language that will work for any engine or any company regardless of other technicalities. This is the basis for a generalized AI, and this is the reason why Google is trying to make TensorFlow more ubiquitous.