



Intelligence Is

Smart is what it Does and How it Does It

By Leopold B. Willner, PhD December 31, 2019

Abstract – *The nuts and bolts of how human and advanced machine intelligence can be harmonized to productively work together is what I-One research is about. The I-One Refinement Project offers the launch of a promising technology on the basis of which to empower a new chapter in man-machine cooperation. It seeks to provide innovative ways to enable humans and intelligent robots to work in harmony together in one-on-one established pairs in ways that empower and free people. As such, it begins with an examination of inherent aspects of human intelligence in counterpoint with the offerings of AGI, artificial general intelligence; above and beyond the analytics of computational AI. The objective is to capture what is of unique essential value in human intelligence and what is of additional utility in AGI, so that, together, they may be employed to triangulate on issues and problems of interest to man in a manner that is efficient and brings a greater level of understanding.*

The I-One Way – In the words of the English poet William Wordsworth: “And now I see with eye serene the very pulse of the machine”. When possible, it is useful to capture what is unique, essential and productive in each form of intelligence, so that together they may

enhance the power of people over their world. The goal is to uncover useful ways to join HI, human intelligence, with AGI. In order to do so, it is most helpful to seek out ways to grasp the very pulse of what is intelligence in each form, human and machine, and to exploit them in synergistic ways that are useful and economic.

There are aspects of human intelligence that correspond to the needs of biological life on Earth, that are not essential to general intelligence in the universe. There are other aspects that represent fundamental solutions to real problems in managing affairs in a risky and uncertain world that will be very hard to replicate in functional machines. All the while, the data handling powers of computers and machine intelligence are far beyond what humans can ever do, and are of exceptional value and utility. As highly contrasting abilities and functionality, the goal should not be to have one imitate the other, but, instead, to find the best ways for them to harmonize while working together. Think, for example, of a duck hunter and his hunting dog, their roles are very different while they are highly interdependent. Or else, after a bird is downed in the water some distance away the shooter would have to wade in cold muddy water to locate and retrieve the fallen duck – and what fun is that? For humans, grinding big data and acting as input for machines is a not much fun either, even for polymaths.

As has been pointed out accurately by a number of the leading lights in AI, such as Stuart Russell of Cal Berkeley, there are, in addition to the many amazing benefits, potential dangers lurking in the new world of AI we are inventing and creating. In particular, machine intelligence can easily be blind sighted into reckless and careless behavior. This may be explained by a lack on the part of machines of a full appreciation of the blessings and utility of culture and consciousness in human affairs,

as well as machines not grasping the full context or having sufficient situational awareness to act safely and appropriately.

Indeed, it is quite easy to require machines to do too much, simply because we think they should be able to do more. This occurs with self-driving vehicles, autonomous weapon systems, automatic controls in nuclear reactors and powerplants, forms of surgery and assigning prescription drugs to children. Nonetheless, driven by powerful economic interests, as well as the zeal to make progress, much momentum exists to push ahead pell mell, with any damage done simply accounted as the price of progress. But is there another, more humanistic and safer way to move forward with the rise of AI and later on AGI?

Moving Forward - with intelligence, imagination and most of all field testing, the I-One Method¹ is just such a way to energize progress, by means of a dual-intelligences systems approach that is very likely to work better than relying on one-sided, man or machine, solutions. Man-machine cooperation should be carried out with little melding together and integrating the parts and roles of the two. As the poet Kahlil Gibran expressed so aptly, "... the pillars of the temple stand apart, and the Oak and the Cypress grow (but) not in each other's shadow." While support and agreement are the goal in many situations, contrasts and disagreement may be necessary and useful at times in finding the best solution to complex situations.

If the world were deterministic, which it most surely is not, and time were not a factor, which it often is, then abstract mathematical approaches, as with the games of chess and go, would be more universally applicable, which they most certainly are not – as when a child is crying desperately. Context and situational

awareness, along with culture and its mores, matter a lot in determining whether the child is possibly ill or simply insisting on getting attention, and mothers instinctively know the difference – while an unconscious robot may easily be made the fool.

In the I-One approach, an intelligent machine or robot and a human are paired to work permanently together in a symbiotic arrangement – where privacy is protected from the prying eyes of others and the great powers each bring to the pairing are organized to coordinate and cooperate most of the time, yet also to stand apart when necessary. This approach utilizes the tools, skills and benefits of HI alongside those of the AGI machine (to be created) as a way to triangulate on answers and solutions. Human marriage benefits from just this sort of approach, as the couple may agree much of the time, disagree some of the time, but always bring to the table their unique male-female contrasting skills and advantages and perspectives which will at times conflict to bring forth useful insights and other advantages.

The I-One approach is also the answer to such questions as: why did the Boeing 737 Max8 disaster that killed 346 people in two air crashes occur? No surprise here, as the Max8 is the redesign of a 1960s airplane that from the outset placed crash on its agenda – by unsuitably lengthening its body and adding misplaced more powerful new engines to carry fifty-percent more passengers. There was little HI and AI joint resolution of issues entertained in the process, where the experience and opinions of the pilots were fully considered. Instead, only the arrogance of technology driven engineers employing AI held sway, about technologies they did not understand they did not understand. Only full on man-machine

¹ Leopold B. Willner; *The I-One Refinement*, CMS Derfler Associates (11) November 2019

cooperation and team play can hope to address many of the issues that are bound to arise in the future, in this and many other situations, as we move forward from AI to AGI while always ensuring that HI is also fully in play.

Contrasting Powers – That said, it is useful and constructive to examine the primary advantages and skills of humans as well as those of intelligent machines, and to scientifically consider how each may be employed in an I-One arrangement. Herein it is helpful to focus on the methods engineers and computer scientists employ, with their requirement for rigor, specificity and functionality; while bearing in mind the benefits and utility of the tools and wisdom of human psychology.

For machine intelligence we may list the following remarkable powers and advantages:

- Massive high-speed data handling, storage and retrieval capabilities
- Great precision and accuracy
- Bayesian and neural network learning tools and methods
- Mathematical tools, heuristics, iterative methods and algorithms
- Statistical and probabilistic tools and methods
- High speed networks and communications means
- High speed enumeration, comparison and search tools
- Precise sensing and measuring devices
- Truth tables and other logical methods
- Consistency and permanence in record handling
- Ways of remaining focused, on point and on track

What machine intelligence lacks and is likely to fall short of for some time to come may include:

- Understanding and wisdom

- A grasp of context and a lack of situational awareness
- Intuition, imagination and creativity
- Out of the box thinking
- Fight or flight skills
- Skill at managing uncertainty
- Self-awareness and consciousness
- Perspective and over-the-horizon vision
- Real time psychological abilities
- Motivation and the drive to achieve
- A sense for game playing and politics
- An advanced reward and pleasure system
- Adaptive decision making

A review of this list of areas in which intelligent machines are likely to show major deficiencies, reminds us that experienced trained humans are often quite gifted in many of these areas. While no single human is empowered on all of it, humans, acting as collectives in organizations, businesses, government, charities, churches, clubs and the like, have often demonstrated great skill and wisdom in the application of these and related capabilities. Also, in managing the politics required to bring people together to make progress.

A Role for Humans - As a result, some human users of advanced technology including AI have a tendency to focus on the amazing powers of machines, while overlooking what these machines may be lacking or missing, as listed above. The same may at times occur in the perception of what humans are and are not good for in this age of advanced e-technology. As a matter of expediency and economic efficiency, there is a growing tendency to reverse traditional roles, wherein tools and machines were there to work for man. While now, instead, it is to have humans act in support of machines, as a big data population of input devices and sensors, in order to assist the work of machines and feed machine training

and learning. While this approach is useful, this tendency will have a powerful dehumanizing effect on people, which, over time, is likely to lead to a devolution of human society, a loss of happiness and even a decline in the arts.

In evolutionary terms this suggests that man is on the way to possibly being replaced. Meaning that once machine consciousness is developed, the deed will surely be in train over a few decades. At which point, as machines spread their wings, it is they, the intelligent conscious robots, who are likely to explore the stars and seek out other advanced intelligences to engage.

That need not happen were humans to find an appropriate role wherein they can be full partners with the intelligent robotic technologies they create and train. If so, what is it that humans can uniquely bring to the table to make themselves worthy of survival? First and foremost, and to various degrees human beings possess many of the qualities listed above where machines are weak or lacking, and possess the ability to employ them productively. At the same time, humans are notoriously weak in areas where machines are amazingly gifted and strong. All of which makes for a very good symbiotic relationship.

The environment and circumstances of human life require that its needs and requirements be satisfied within a framework of worldly risk and uncertainty. Further, that it be done in real time and under the auspices of compliance with rules and obligations while operating under contracts, protocols, laws and social mores to overcome ever-changing barriers and obstacles, including human preferences, phobias and politics. Quite a difficult and highly constrained environment to successfully navigate and

manage. This is a situation that calls for high intelligence that is also quite flexible and willing to go beyond cold facts and sterile logic, to act as best it can, when it must, with whatever tools are at hand to do the job using intelligence, emotions, learned behavior, social conditioning and team play along with a brave heart. Much of this is not an easy target for development in more advanced machines, at least not yet.

Positive Emotions Drive Action - While the field of psychology has over the years done much to improve the behavior of emotionally disturbed people, it has placed far less emphasis on making things better for those who are not so encumbered. Therefore, the role of positive emotions has in many cases not received the practical attention it requires in order to facilitate effective man-machine play. Yet it is these positive emotions that drive much of human behavior whether it be for fight or flight or for power attainment via compensation, conditioning and punishment². Therein, the positive emotions of man can readily fill-in the large gaps left by reason and logic alone in the affairs of people, so they may act in a timely and appropriate manner.

The positive emotions in play in life powerfully impact how people behave, what endeavors they pursue and what chances they are willing to take, as in recent years explored and organized by the psychologist Barbara Frederickson³ and her colleagues, to include:

- Joy
- Gratitude
- Love
- Relief
- Inspiration
- o Hope
- o Pride
- o Satisfaction
- o Altruism
- o Interest

² John Kenneth Galbraith; *An Anatomy of Power*, Houghton Mifflin Press, 1983

³ Barbara L. Fredrickson; *The Role of Positive Emotions in Positive Psychology*, American Psychologist, 56, 218-226.

- Amusement o Serenity

Each of these positive emotions may help to drive humans to participate or take action in their lives, even when risk and uncertainty is high, data sets are incomplete and best practices unknown. Without these positive emotions as drivers, the world of man would be a very different, less productive and far less interesting place within which to plan, to dream and to exist. Thus, while the well-known negative emotions of fear and anxiety have their place, it is the positive emotions that humans can bring to the table that will make the man-machine world work better and progress. Especially under the auspices of the I-One Model wherein humans and highly intelligent machines are paired one-on-one to privately use the strengths of each to empower the success of the pair, while overcoming the many weaknesses each has when acting on its own.

The study of how to marry positive emotions within a man-machine duality, as the I-One

Model attempts to do, represents a most promising long-term scientific endeavor for all mankind. One that will require the open participation of thousands of social scientists, computer science practitioners and engineers along with further discovery, invention and innovation in the physical sciences.

Conclusion – We may now observe that man-machine cooperation, to be effective and safe, needs to operate as a three-legged stool, with:

- The unique functional capabilities of intelligent machines fully utilized
- Humans in the role of bridging the gaps in machine thinking to compensate where advanced machine intelligence is lacking, limited or flawed.
- An essential role for Positive Human Emotions within an I-One or other dual streams model.



Leopold B. Willner, PhD 831-325-5008 leo@dualstream.tech and CMS Derfler Assoc.