Information Management with the Global Brain

Louis Massey

Royal Military College of Canada, Kingston, Ontario

Abstract. Despite over fifty years of research, many of the promises of Artificial Intelligence have failed to materialize, in particular with respect to natural language understanding. In this paper, we emphasize an alternative: the power of man-machine integration within the context of the global brain to improve our abilities to access and process natural language text information. This is highly important considering that much of essential human knowledge, be it corporate, medical, or scientific, etc., is stored as electronic text. With the synergy of human collaboration in a permanently connected world, society now has the tools to develop better information management. This in turn may become a major enabler of human evolution.

Keywords: Information Management, Global Brain, Collaborative Intelligence

1. Introduction

MacLuhan [1] described technology as an extension of our senses, of our nervous system. This extension has up to now been external, with devices and tools such as computers and mobile phones. As computing and telecommunication devices became smaller and more powerful, we have achieved the ability to be constantly connected. One of the consequences of this connectivity is the creation of a "global brain" [2] in which the synergy of large groups of people and computers in a global network is exploited to resolve complex problems as well as to organize information. Two examples of such global brain collaborations are Wikipedia and reCAPTCHA[1] [3].

The global brain could become even more powerful. Kurzweil [4] suggested that men and machines will merge, where technology will not be a mere external extension but will become an integral part of our body and mind. Kurzweil also predicts what he calls a "singularity" – a point in time where progress will be exponential due to men-machine symbiosis.

Should we worry about such a radical change or should we embrace it? A major justification to embrace the change is that humans are not as smart as they think. Although we claim to be rational being, our actions are unfortunately too often guided by irrational beliefs and biases. We indeed have multiple cognitive limitations and we often end up taking unwise decisions [5, 6, 7]. In that sense, technologies can indeed be very useful enablers of better minds and, consequently, of a better world. A simple example of negative impact of human behaviour is how people drive, causing traffic congestions and accidents. If machines drove cars, roads would be both safer and more effectively used, with enormous savings for society, financially but also in emotional and physical pains [8, 9].

Thus, men-machine symbiosis leading to "transhumanity" [10] may be necessary if we are to resolve the most complex problems facing Humanity, which may otherwise be beyond our current intellectual capacity. Highway congestion is but a mild example of problems we seem unable to resolve: one must also consider poverty and hunger, population growth, conflicts between and within nations, climate change and many others.

In this paper, we address how a fusion of humans and technologies within the context of the global brain can help to resolve a specific and important problem: the management of the very large amount of natural language text information.

<< rest of paper not available on line >>

[1] reCAPTCHA exploits the visual pattern recognition abilities of humans as a side effect of authenticating them as human. We perform this task regularly and possibly unknowingly when asked to enter words presented in a distorted form on a website. The goal is to use human cognition to help digitize documents. See http://www.google.com/recaptcha.

References

[1] M. McLuhan and L.H. Lapham. *Understanding Media: The Extensions of Man*. The MIT Press, 1994.

[2] A. Bernstein, M. Klein and T.W. Malone. Programming the global brain. *Comm ACM* 2012, **55**(5): 41-43.

[3] L. von Ahn, B. Maurer, C. McMillen, D. Abraham and M. Blum. reCAPTCHA: Human-based character recognition via Web security Measures. *Science* 2008, **321**: 1465-1468

[4] R. Kurzweil. *The Singularity is Near*. Penguin Group, 2005.

[5] D. Ariely. *Predictably Irrational*, HarperCollins, 2008.

[6] K.E. Stanovich, R.F. West and M. E. Toplak . Intelligence and rationality. In: R. J. Sternberg & S. B. Kaufman (Eds.), *Cambridge handbook of intelligence* (3rd Edition), Cambridge,UK: Cambridge University Press, 2011.

[7] M. Heffernan. *Willful Blindness: Why We Ignore the Obvious at Our Peril*, Walker & Company: New York, 2011

[8] J.A. Laval and L. Leclercq. A mechanism to describe the formation and propagation of stop-and-go waves in congested freeway traffic. *Phil. Trans. R. Soc*. 2010, **368**(1928): 4519-4541

[9] R. O'Toole. *Gridlock: why we're stuck in traffic and what to do about it*. Cato Institute, Washington, DC, 2009.

[10] N. Bostrom. A history of transhumanist thought. *Journal of Evolution and Technology*, 2005 **14** (1).

[11] L. Massey L. Real-World Text Clustering with Adaptive Resonance Theory Neural Networks, In: *Proc. of 2005 International Joint Conference on Neural Networks*, 2005.

[12] L. Massey L. Autonomous and Adaptive Identification of Topics in Unstructured Text In: *Proc. 15th International Conference on Knowledge-based and Intelligent Information and Engineering Systems*, 2011, pp. 1-10.

[13] L. Massey. A Cognitive Framework for Core Language Understanding and its Computational Implementation. *International Journal of Cognitive Informatics and Natural Intelligence*, 2012 **6**(1): 1-20.

[14] J. Orkin. Using online games to capture, generate, and understand natural language. In: *Proc. of the 13th European Workshop on Natural Language Generation*, 2011 pp. 71-71.

[15] L. von Ahn and L. Dabbish. Designing games with a purpose. *Commun. ACM* , 2008 **51**(8): 58-67.

[16] D. Tapscott. *Grown Up Digital: How the Net Generation is Changing Your World*. McGraw-Hill, 2009

[17] Nokia. *Multi-Way Analysis for Audio Processing*, United States Patent Application 20120207310, 2012.