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AI by Any Other Name

Hi all,
To borrow from The Bard, what's in a name? The world is awash with the hype, the reality, the potential, and the concerns of Artificial Intelligence. But what constitutes AI? That depends on who, and when, you ask. When I was a kid (academically speaking), tasked with teaching a course on AI, I "knew" what it was: systems with propositions consisting of discrete symbols, manipulated through first order predicate calculus, sometimes with a helping of probability on the side. There were languages and hardware developed to assist in that enterprise. So, when the IEEE Neural Networks Council/Society changed its name to the IEEE Computational Intelligence Society, it made perfect sense to me that CI was different from AI since the underlying models were rooted in numeric and functional representations, producing a nice crisp partition of techniques.

But was that ever the case? Not long ago, I found a copy of the 1955 proposal by John McCarthy with Marvin Minsky, Nathaniel Rochester and Claude E. Shannon for the now famous Dartmouth conference in the Summer of 1956 and in which they coined the term "Artificial Intelligence" [1]. They defined AI as "the science and engineering of making intelligent machines." McCarthy et al conjectured "that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it." But, there in the proposal, was the inclusion of the fledgling "neuron networks," a pillar of computational intelligence. So, the partition of methodologies and techniques into AI and CI was never crisp, and certainly with respect to neural networks was not even a fuzzy partition where membership is shared between the groupings—artificial neural networks is recognized as a full component of both AI and CI. Hence, (some of you at least knew this was coming), the partition in my mind is possibilistic, where any given approach can have varying degrees of typicality (membership) in both worlds. For example, is fuzzy logic restricted only to CI? Well, some of us argue that it represents one of the ways to address the growing field of XAI (eXplainable AI). Members of CIS went through an exercise a few years ago to try to determine the boundaries between AI and CI. We discovered that there was no consensus. Some held my early 1980s-fueled thought that AI and CI were disjoint, some that CI was a subset of AI (or vice versa), and many postulating varying degrees of overlap. I'm arguing here that we shouldn't get too hung up with names. We are the CIS, but we are also the society of AI, though many of our

sister societies share in this possibilistic partition. When, under the lead of CIS, a group of IEEE Societies proposed and established the *IEEE Transactions on AI*, we chose to write a simple scope "theories and methodologies of Artificial Intelligence" (along with applications). This allows us to accommodate the breadth and evolution of the field. Our founding EiC, Hussein Abbass, established some guiding principles for his term at the helm, but like the "pirate code," they are more guidelines than rules.

To wrap these ramblings up, I've at least decided to take a broad perspective about the membership of any given approach in the sets of CI and AI methods, believing that they are not mutually exclusive. Reminds me of a potential society tagline we discussed a while back: *the best AI is CI*. The main thing is to do good and responsible science and engineering, and to have fun. Feel free to contact me at kellerj@missouri.edu with your thoughts, suggestions, questions, and innovative ideas, even/especially if you disagree. Please stay safe and healthy.

I hope to see many of you this year as we try to emerge from the pandemic.

Reference

[1] J. McCarthy, M. Minsky, N. Rochester, and C. Shannon, 1955, "A proposal for the Dartmouth summer research project on artificial intelligence," archived from the original on 2007-08-26, retrieved 10:47 (UTC), 9th of April 2006, reprinted in *AI Mag.*, vol. 27, no. 4, pp. 12–14, 2006.

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