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Dan E. Willard* (dwillard@albany.edu). *On the Utility of Partial Evasions of the Second Incompleteness Theorem in the Modern Digital Era.*

We have published several articles about generalizations of the Second Incompleteness Theorem and partial evasions of it under formalisms that own a partial knowledge about their own self-consistency (These papers are cited and summarized in <http://arXiv.org/abs/1807.04717> of the Cornell archives). The late physicist Stephen Hawking has predicted that global warming will likely be so severe that civilization emanating from Earth will find it difficult to continue without employing Artificially Intelligent computers and probably space travel within the Solar System. Our research into Self-Justifying logic systems should be germane to at least one facet of Hawking's aspirations for AI. This is because for any r.e. axiom system A, our formalism can devise a system "IS(A)" that can prove analogs of all A's Π_1 theorems (under a revised language that treats multiplication as a 3-way relation), as well as to recognize the validity of at least a fragmentary definition of its own consistency, and to support an AI system that can survive even if the potential extinction of mankind on Earth does occur. Much added engineering will need be done, but IS(A)'s formalism should be a helpful start to what will be a much larger, more ambitious project. (Received September 18, 2018)