Questions

1. Connectionist architecture is the implementation of many leveled, parallel-processed algorithms and this "neural" network "mirrors" (Lowney's term) tacit knowing and tacit learning. From a Polanyian perspective, machines or, more generally, "contrivances" (telic artifacts, including digital computers) and persons are structurally and operationally akin; both thus need to be conceived in terms of what Polanyi terms "hierarchy" and "dual control" and to be recognized as potentially "emergent." **Are contemporary deep neural networks a new type of "contrivance" since they seem to be "predictive analytic" devices that can provide deep learning pattern recognition?**

2.Polanyi insisted on the importance of unformalized elements in all knowing. You can find this in his 1951 essay "The Hypothesis of Cybernetics" (which grew out of his participation in the 1949 Manchester conference on "Mind and the Computing Machine"), in his Gifford Lectures, in *Personal Knowledge* and later writings. Early on, Polanyi seems most frequently to conceive the digital computer as "a formalized deductive system" and he insisted that it is fallacious to speak of such a system as operating independent of "unformalized supplements" provided by a human being using the system. Polanyi apparently saw as folly the early AI effort to create fully explicit knowledge-based systems that emulated experts; this approach ignored tacit knowledge. But it is unclear if Polanyi anticipated the more recent move in AI to "predictive analytics" which neural network algorithms makes possible. **If "current AI mimics but doesn't truly 'dwell in' its processes" (point 3, p. 2, in the summary of "The Rise of the Machine") is this the reflection of "unformalized supplements" which a human user of the AI system provides? How should we specify the connection between the person as the user and the AI contrivance the person uses?**

3. Lowney's approach to understanding AI counters the kind of philosophical approach to/understanding of AI represented by Dreyfus and, more recently, Collins who focus on drawing lines in the sand that try to distinguish capabilities of machines and human beings. Polanyi emphasizes tacit integration, dual control and emergence as a counter to "drawing lines in the sand." Aligning persons and machines (or "contrivances") and focusing on what they have in common is "Polanyi's alternative." Nevertheless, Polanyi does seem to make a clear distinction between "contrivances" and "living beings" insofar as contrivances are

not autonomous or independently creative or inventive as embedded living "comprehensive entities" seem to be; "contrivances" are only put into play by persons who dwell in them. "Contrivances" in a word are constructed and used by human beings and function in a particular social context organized by human beings. Contrivance do not have "minds" for Polanyi. **But are contemporary AI contrivances actually simulating a mind?**

4. Moving beyond the set of metaphysical issues that Lowney's paper primarily explores, there are a staggering array of questions today about AI in society that might be generically dubbed **social-political policy/ethical questions**. Heder and Tartaro suggest this is the domain of AI ethics. Neural network algorithms have been developed and are being put to use in different kinds of societies with a variety of cultural-economic-political systems and traditions. In the US, it appears that AI especially serves those interested in marketing and in social control. In *Full Employment and Free Trade* (1945) Polanyi suggested that a capitalist economy "can be operated in conformity to any standards of economic justice, provided that those are widely enough accepted by society as a whole." **Does this post-critical Polanyian affirmation provide any leverage for addressing the social-political policy ethical questions in any particular society?**