Letters to the Editor

Dear Editor:

Several of my colleagues have demanded, often publically, that I provide them with a genus-differentia definition of artificial intelligence. I suspect that their motive was summary rejection of new-fangled techniques, not etymological enlightenment. In any case I answered them. I tried to capture the invariant structure of the many reportive definitions available, distinguish the term from robotics (adaptive control theory), and keep all notions of “wetness” out of the definiens. Perhaps your readers may be interested in the answer.

Sincerely yours,
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Definition 1. An agent knows some statements if the following three conditions hold:

1. $s$ is true, i.e., $s$ is either a logical truth (a theorem or a tautology) or a factual truth (a correspondence with fact);
2. the agent believes that the statement is true, i.e., if verbally stimulated, the agent emits an assent response to $s$, a dissent response to not-$s$;
3. the agent can justify its belief that $s$ is true, i.e., the agent can provide (acceptable relative to some predetermined and agreed upon evidential criteria) reasons (logical arguments, or facts)

Definition 2. An agent’s knowledge is the set of all statements that the agent knows (i.e., the set $\{s: \text{the agent knows } s\}$).

Definition 3. An agent’s problem-solving behavior is intelligent if (and to the extent that) the agent’s problem-solving method combines search and knowledge so that the search time and quantity of knowledge are inversely related (i.e., the knowledge prunes the search space).

Definition 4. An agent’s problem-solving behavior is artificially intelligent if the behavior is intelligent and the agent is a machine.

Remark: It is a consequence of this definition of artificial intelligence that artificial intelligence does not equal artificial endocrinology!