Computation, Information, and Intelligence (ENGRI/CS/INFO/COGST 172), Spring 2007
1/22/07: **Lecture aid — Introduction to computing and information science and to AI**

Agenda: A breezy discussion of computers, the distinguishing characteristics of "true programmability", and the ups and downs of the Romance of AI, before we get down to work in subsequent lectures.
Announcements:

- This sheet of paper is a "lecture aid". Lecture aids should be kept out during lecture because we will refer to them during class (hence the name). They are also intended as a supplement to, *not* a replacement for, your own taking of notes. You may find it convenient to keep them in a 3-ring binder.
- Non-freshmen need permission to enroll in the course. Please pick up an application form from Prof. Lee after class. (All freshmen are permitted to enroll regardless of prior experience with COM S 100; the Courses of Study had outdated information about this.)
- At your earliest convenience, please read the "Course Description and Policies" handout distributed today. Make sure to familiarize yourself with the policies and schedule (including the fact that the final is May 18th, 2-4:30pm) outlined therein.

Two quotations regarding computer science:

A. The computer revolution is a revolution in the way we think and in the way we express what we think.

B. Computer science is the study of the phenomena surrounding computers.

The surrounding context:

C. (*from the same source as A.*) Underlying our approach to this subject is our conviction that "computer science" is not a science and that its significance has little to do with computers.

D. (*from the same source as B.*) The founders of this society understood this very well when they called themselves the Association for Computing Machinery. The machine – not just the hardware, but the programmed living machine – is the organism we study.

And a useful thought to keep in mind:

E. The "skin-of-an-onion" analogy is also helpful. In considering the functions of the mind or the brain we find certain operations which we can explain in purely mechanical terms. This we say does not correspond to the real mind: it is a sort of skin which we must strip off if we are to find the real mind. But then in what remains we find a further skin to be stripped off, and so on. Proceeding in this way do we ever come to the "real" mind, or do we eventually come to the skin which has nothing in it? — Alan M. Turing, "Computing machinery and intelligence". *Mind* (59), pp. 433–460, 1950.

The course theme: the emergence of *intelligent behavior* through the interaction of *computation* and *information* — in ways you might not *e*xpect, but which are worthy of your *re*spect, nonetheless.

(OVER)

References and (completely optional) further reading

Quote A is from page xviii of Harold Abelson and Gerald Jay Sussman, *Structure and Interpretation of Computer Programs*, second edition (1996). Quote B is from page 113 of Allen Newell and Herbert A. Simon, "Computer Science as Empirical Enquiry: Symbols and Search" (tenth Turing award lecture), *Communications of the ACM* 19(3), pp. 113–126, 1976.

The "No hands across America" homepage,

http://www.cs.cmu.edu/afs/cs/user/tjochem/www/nhaa/nhaa_home_page.html ,

hosts a trip journal, photos, and other information. A technical reference on NavLab and the vision system that learned to steer can be found in Dean Pomerleau, *Neural Network Perception for Mobile Robot Guidance* (1993).

More information on e-rater and related tools can be found at www.ets.org/research/erater.html (this redirects to a longer URL). An article describing an experiment in which people attempted to "trick" e-rater is Donald E. Powers, Jill Burstein, Martin Chodorow, Mary E. Fowles, and Karen Kukich , "Stumping e-rater: Challenging the validity of automated essay scoring", ETS Research Report 01-03, available online at the URL just given. Another version appears in *Computers and Human Behavior* 18(2), pp. 103–134 (2002).

And finally, it should not be said that there have been no advances in blender science: see Kelly Dobson's "Blendie" (2003-2004), web.media.mit.edu/~monster/blendie/ .