

# Can Machines Know? Can Machines Feel?

## CS 21N

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**Meeting Times:** Monday, Wednesday 9:30 – 10:45

### Staff

- Yoav Shoham  
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- Eric Pacuit  
Gates 258  
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### Topics/Suggested Readings

1. John McCarthy, Ascribing Mental Qualities to Machines, 1979
2. John, McCarthy, What is Artificial Intelligence, 2007
3. Can machines think?  
*Suggested Readings*
  - Alan Turing, Computing Machines and Intelligence, Mind, Vol. LIX, 1950 (reprinted in The Mind's I, by Hofstadter)
  - Paul Churchland and Patricia Churchland, Could a Machine Think? Scientific American, 1990
  - John McCarthy, The Little Thoughts of Thinking Machines, 1983
  - Chinese Room Argument:
    - <http://plato.stanford.edu/entries/chinese-room/#3>
    - John Searle, Minds, brains, and programs. Behavioral and Brain Sciences 3 (3): 417-457, 1980
  - Herbert Simon, Machine as Minds, in *Android Epistemology*, 1995
4. Can machines feel?  
*Suggested Readings*
  - Marvin Minsky, Chapter 1 of *The Emotion Machine*, 2006
  - Aaron Sloman and Monica Croucher, Why Robots will have Emotions, Proceedings of IJCAI, 1981
  - John McCarthy, Robot and the Baby, 2004
5. Can a machine have free-will?  
*Suggested Readings*

- John McCarthy, Simple Deterministic Free Will, 2005
  - Raymond Smullyan, Is God a Taoist?, in *The Mind's I*, originally published in 1977
6. Can machines have common sense?  
*Suggested Readings*
- M. Minsky, Commonsense-based interfaces, Communications of the ACM 43(8): 67-73. ACM Press, 2000.
  - P. Singh, M. Minsky, I. Eslick, Computing Commonsense, BT Technology Journal, 2004.
  - J. McCarthy, Programs with Common Sense, 1959
  - D. Lenat, From 2001 to 2001: Common Sense in the Mind of Hal, in *Thinking about Android Epistemology*, 2006
7. Can machines be creative?  
*Suggested Readings*
- Margaret Boden, Could a Robot be Creative — And Would We Know?, Chapter 14 in *Thinking about Android Epistemology*, 2006
8. Can machines be conscious?  
*Suggested Readings*
- David Chalmers, The Puzzle of Conscious Experience, Scientific American, 1995

### Suggested Course Material

1. We expect you to find most material by searching Google (for example, almost all of the above articles can be downloaded from the authors' websites).
2. Some material is taken from the following books:
  - (a) *The Emotion Machine* by Marvin Minsky, Simon & Schuster, 2006
  - (b) *The Mind's I* edited by Douglas Hofstadter and Daniel Dennett, 1981
  - (c) *Thinking about Android Epistemology* edited by Kenneth Ford, Clark Glymour and Patrick Hayes, 2006
3. The online *Stanford Encyclopedia of Philosophy* contains a few relevant articles. For example,
  - (a) The Turing Test: <http://plato.stanford.edu/entries/turing-test/>
  - (b) Logic and AI: <http://plato.stanford.edu/entries/logic-ai/>
4. The radio show *Philosophy Talk* (hosted by two Stanford Philosophers, John Perry and Ken Taylor) has some interesting shows:
  - (a) An interview with Marvin Minsky  
<http://www.philosophytalk.org/pastShows/ArtificialIntelligence.html>

- (b) An interview with John Searle  
<http://www.philosophytalk.org/pastShows/MysteryofMind.htm>

**Tentative schedule (subject to change)**

- Wednesday, April 2** Introduction and Overview  
**Monday, April 7** Student Presentation: Can Machines Think?  
(Turing's Paper)  
**Wednesday, April 9** Student Presentation: Can Machines Think?  
(McCarthy's Paper)  
**Monday, April 14** Student Presentation: Can Machines Think?  
(Searle's Chinese Room Argument)  
**Wednesday, April 16** Student Presentation: Can Machines Feel?  
(Solomon and Croucher)  
**Monday, April 21** Student Presentation: Can Machines Feel?  
(Minsky's Emotion Machine)  
**Wednesday, April 23** Movie  
**Monday, April 28** Presentation: Yoav  
**Wednesday, April 30** Student Presentation: Can Machines have free-will?  
**Monday, May 5** Student Presentation: Can Machines have free-will?  
**Wednesday, May 7** Invited Speaker  
**Monday, May 12** Student Presentation: Can a machine have common sense?  
**Wednesday, May 14** Movie  
**Monday, May 19** Presentation: Eric (logic and logic puzzles)  
**Wednesday, May 21** Student Presentation: Can machines be Creative?  
**Monday, May 26** **Memorial Day, NO CLASS**  
**Wednesday, May 28** Student Presentation: Can Machines be conscious?  
**Monday, June 2** Invited Speaker  
**Wednesday, June 4** Final Discussion