



Center for
**LifeLong
Learning
& Design**

University of Colorado at Boulder

**Wisdom is not the product of schooling
but the lifelong attempt to acquire it.
- Albert Einstein**

Discussion of Bill Joy's article "Why the future doesn't need us"

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**Course information environment (SWIKI):
<http://l3dswiki.cs.colorado.edu:3232/phd-intro>**

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Bill Joy's Argument in a Historical Context

- “The coming advances in computing power *seem to make* autonomous, intelligent, replicable agents possible by 2030.”
- “Computer Scientists were saying similar things about new Artificial Intelligence agents they'd built in 1960... it later turned out to be much more difficult than they'd anticipated.”

Artificial Intelligence Questions in 1963 — and Before

- Is it possible for computing machines to think?
- But doesn't a computer do exactly what it is told to do and no more?
- Is it true that a computer will be a chess champion because the computer is so fast that it can examine all possible moves and their consequences?
- What are some unsolved problems of Artificial Intelligence?
- What are the limits of Artificial Intelligence?

Claims

- Making computers intelligent helps us to understand intelligence.
- Intelligent computers are more useful computers.
- Intelligent computers have their own will.
- Intelligent computers will make mistakes.
- Intelligent computers will / should replace human beings (e.g.: expert systems, ABS, flight computers,)
- Intelligent computers will / should empower and augment human capabilities (IA = Intelligence Augmentation, Einstein: “My pencil is cleverer than I”!)

Version 1 of a Dialogue

P: Men are all alike.

C: In what way?

P = Person

C = Computer Program

P: They are always bugging us about something or other.

C: Can you think of a specific example?

P: Well, my boyfriend made me come here.

C: Your boyfriend made you come here?

P: He says, I am depressed much of the time.

C: I am sorry to hear that you are depressed.

P: It is true, I am unhappy.

C: Do you think coming here will help you not to be unhappy?

P: I need some help, that much seems to be certain.

C: What would it mean to you if you got some help?

P: Perhaps I could learn to get along with my mother.

C: Tell me more about your family!

Version 2 of a Dialogue with the same System

P: My mumble bzzz grumble grumble.

C: That's very interesting.

P: Ugh, you izzle flerp me.

C: What makes you think that I izzle flerp you?

P: Gorch.

C: Does that have anything to do with the fact that your mumble bzzz grumble grumble?

Different Views about AI

Person_A: My students have programmed computers to solve mathematical problems, play games, even to understand some English.

Person_B: I know those programs and I don't feel that they really think. They only do what they are programmed to do. People are individuals with free will. They have creative intellects.

Person_A: Newborn babies do only what they are programmed to do by their genes and environments. And they never do anything very creative until programmed by parents, school and the culture at large.

Person_B: That's not being programmed! At least the children learn it themselves, by walking around, seeing, touching, feeling, loving. That's not being programmed. That's *experiencing*.

Different Views about AI – Continued

Person_A: Well, if you like. But we are beginning to make robots which can see, touch manipulate, make mistakes and learn while doing all that. The gap is closing.

Person_B: Irrelevant. Even if computers were to show the same *outer* behavior as people, you can be sure that what is going on inside is totally different. As different as birds and airplanes. Birds and people feel. Airplanes and computers don't.

Person_A: Birds and Airplanes *are* different. But the same science of aerodynamics helps us to understand both of them. It's only after people learned to make and fly airplanes that they knew what to look for in trying to understand birds. Perhaps we must first build thinking machines before we know the right questions to ask about thinking and feeling.

Some Responses to Bill Joy's Article

- who is Bill Joy?
- areas considered: robotics, genetic engineering, nanotech
- article offers
 - a thoughtful analysis
 - is the problem of self-replication of robots and nanotechnology is in the realm of the future or science fiction?

Some Responses to Bill Joy's Article — Continued

- is the article
 - pessimistic
 - paranoid?

- individual basis
 - understand the implication of our research
 - techno-utopist or a techno-pessimist
 - someone in between? e.g. techno-optimist?
 - are these the wrong conceptualizations to start with?

- societal basis
 - choose leader who understand the implications of the technological advances

Will our Technology Destroy Us?

- “humankind will recognize disaster scenarios before they occur and find ways to avoid them”
- Gerhard’s claim: all important technologies are “Faustian Bargains”
- important problems (“disaster areas”) in addition to robotics, genetic engineering, nanotech:
 - global warming
 - privacy
 - security