CSCI 2270

Data Structures & Algorithms

Gabe Johnson

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Human-Computer Interaction

Today is Optional

In case you didn't know

Human
Computer
Interaction

Humans. What are they?

- In the 5-to-6 foot range
- Roughly 200 pounds
- Opposable thumbs! Good!
- Good eyes. Terrible sense of smell.
- Huge brains.
- Capable of planning tomorrow's dinner *today*

Humans are Social

- Live in groups.
- Sometimes go to college
- Have conventions (by that, I mean standard protocols for carrying on)
- Our plans involve *each other*

Humans have Values

What's important to one human is going to be different from what's important to the next.

Kids	Environment	Safety
School	Civil Rights	Where's Mom?
Work	Solitude	Security
Religion	Togetherness	Cats and Dogs
Football	Tasty Beverages	Humor
Privacy	Free Speech	Culture

Humans Use Technology

Technology affords new capabilities
(this is the good part)
Technology imposes new requirements
(this is the not so good part)

Technology changes us,
And then we make more technology

Computers

Replace “Computer” with “Technology” and you have a more accurate read on what I’m talking about.

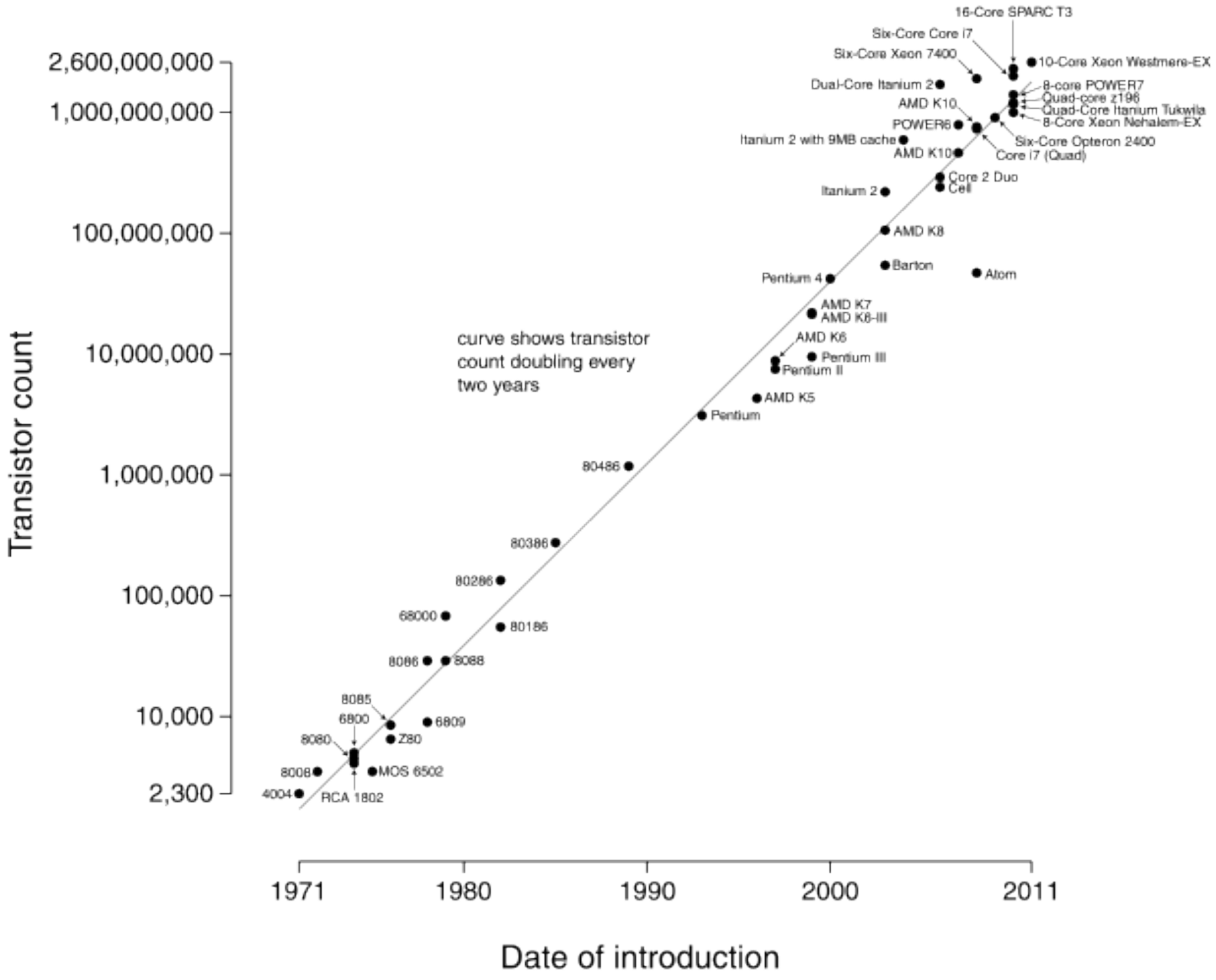
- Runs on electricity
- Can process only what its sensors give it
- Data stored digitally, as magnetic or electric bits
- Can make billions (trillions?) of calculations or mistakes per second.

Computers Get Faster

Moore's law: the number of transistors that can occupy the same space doubles about every two years.

This means our computational power doubles so often that we have to use exponential-scale graphs to show it in a meaningful way.

Microprocessor Transistor Counts 1971-2011 & Moore's Law



Computers Still Suck

- Can’t figure anything out using basic common sense
- Can’t predict my needs like a person can
- Terrible dinner partner
- Can barely play ping-pong

http://www.youtube.com/watch?v=t_qN3dgYGqE

Interaction

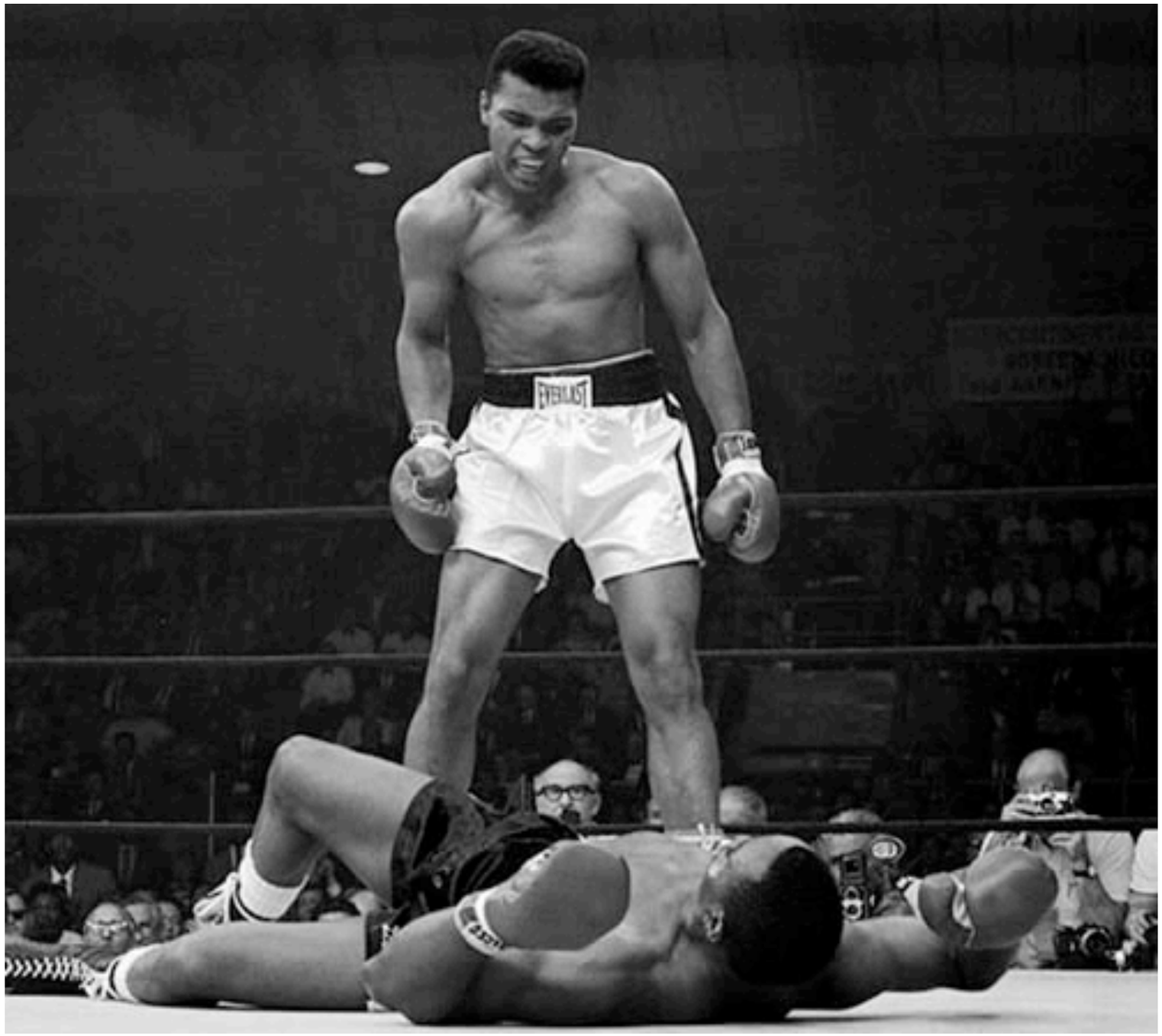
Humans interact with one another that we (well, most of us) are so good at it that we barely think of it as a *thing*.

Interaction involves at least two actors that change one another through physical or informational means.

Humans can use language, or our bare hands.

Human-Human Interaction

Human-Human Interaction



Human-Computer Interaction

Somewhat more hostile than the last picture.

And computers are apparently winning.

Why?

Because we don't understand how to make technology that changes humans for the better.

At the moment it is all fairly random.

Bad Interaction = Waste $

Since we're all broke, we usually want to spend the least amount of money.

But consider how much time and effort you spend trying to get terrible technology to work.

If the interaction were better you could focus on your work, rather than the technology. This is why companies are starting to (finally) pay attention to interaction design, and why you should consider paying for it as a customer.

It Gets Better

But if we understand that technology will potentially change us (in both positive and negative ways) then we can apply a scientific approach to understand

Humans,
Computers
and
the way they **Interact**

... and not fail so abysmally.

Several Projects

GRAIL and SketchPad (Design)

Robots (Human-Robot Interaction)
- Big Dog
- Picollo
- Cubelets

All Manner of Art Things

HCI is not about Surface

One (bad) engineering professor's recommendation letter for a student applying to HCI:

I was a little surprised when D told me that he planned to transfer to HCI, However, I understand and respect his decision. From our conversations and his work, I could sense D has his understanding about taste. His PPTs are always appealing in engineering students. He chooses the color, fonts and animations very well so that his PPTs express an overall sense of beauty. Once the leader of our customer even asked me to copy his PPT for reference, after he gave the project acceptance presentation.

HCI is about Interaction

Interaction is the fundamental thing that humans do with one another that has enabled our species to do amazing things, like invent the Roomba.

It is not about surface, it is not about choosing colors or styling things. It is about crafting behaviors, and using computation to predict how people will behave as a response to the computer (or robot's) action.

Video Time!