

*Singularity,  
SeaChange and  
Superheroes*



## *Who is Ray Kurzweil?*

- Humanitarian
- Inventor
- Writer
- Futurist



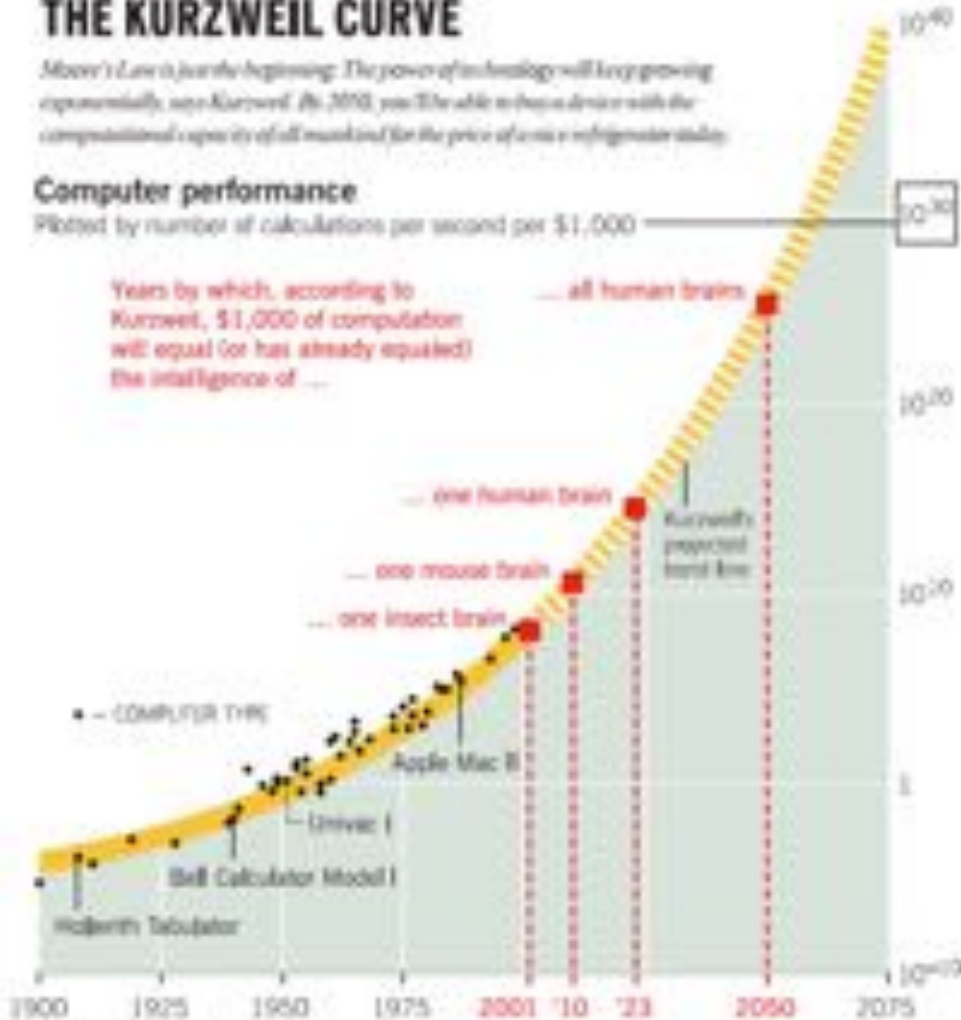
# THE KURZWEIL CURVE

Moores' Law is just the beginning. The power of technology will keep growing exponentially, says Kurzweil. By 2010, you'll be able to buy a device with the computational capacity of all mankind for the price of a nice refrigerator today.

## Computer performance

Plotted by number of calculations per second per \$1,000

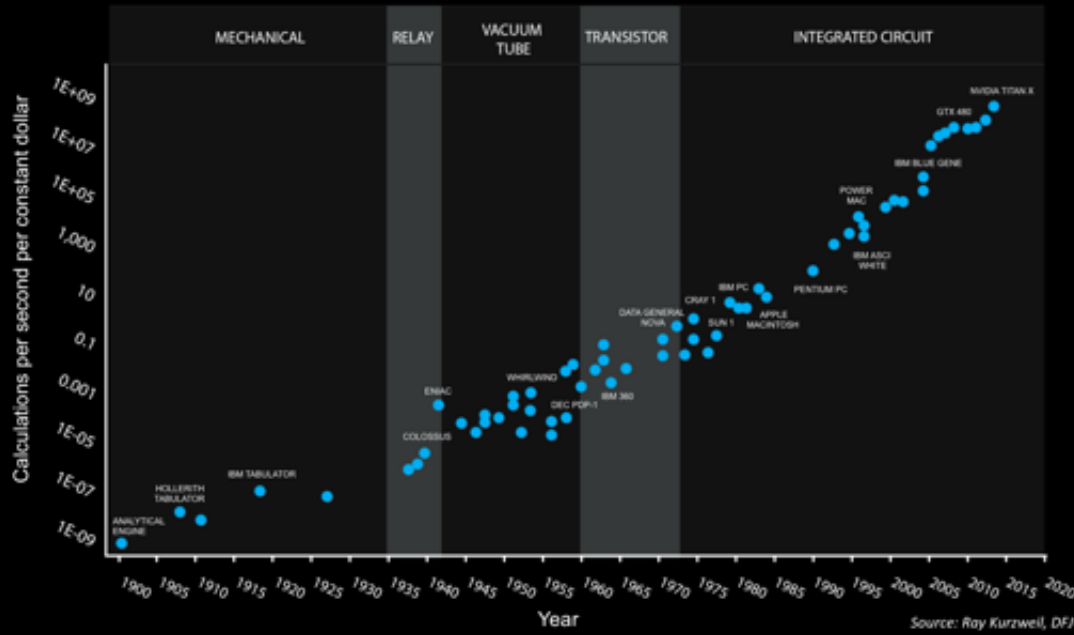
Years by which, according to Kurzweil, \$1,000 of computation will equal (or has already equaled) the intelligence of ...



## What is the SINGULARITY?

The **singularity** is a hypothetical future point in time when technological growth becomes uncontrollable and irreversible, resulting in unfathomable changes to human civilization and incomprehensible to previous generations.

# 120 Years of Moore's Law



**Moore's Law** refers to **Moore's** perception that the number of transistors on a microchip doubles every two years, though the cost of computers is halved. **Moore's Law** states that we can expect the speed and capability of our computers to increase every couple of years, and we will pay less for them.

NATIONAL BESTSELLER

WHEN COMPUTERS EXCEED  
HUMAN INTELLIGENCE

# THE AGE OF SPIRITUAL MACHINES



**RAY KURZWEIL**  
AUTHOR OF *THE AGE OF INTELLIGENT MACHINES*

"The Age of Spiritual Machines will blow your mind. Kurzweil lays out a scenario that might seem like science fiction if it weren't coming from a proven entrepreneur."  
— San Francisco Chronicle

## *What is the Law of Accelerating Returns?*

In his 1999 book *The Age of Spiritual Machines*, Kurzweil proposed "**The Law of Accelerating Returns**", according to which the rate of change in a wide variety of evolutionary systems (including but not limited to the growth of technologies) tends to increase exponentially/. Today, Kurzweil proposes that the rate of change itself is accelerating exponentially.

# 1 The accelerating pace of change ...



# 2 ... and exponential growth in computing power ...

Computer technology moves here climbing dramatically by powers of 30, is now progressing more each year than it did in its entire first 90 years.

## COMPUTER MILESTONES

In chronological order (see 10.100)



**Analytical engine**  
Never fully built, Charles Babbage's Analytical engine was designed to solve computational and logical problems.



**Colossus**  
The electronic computer, with 1,500 vacuum tubes, helped the British crack German codes during WW II.



**ENIAC 1**  
The first common room-sized computer, used to calculate the U.S. Census, occupied 940 sq. ft.



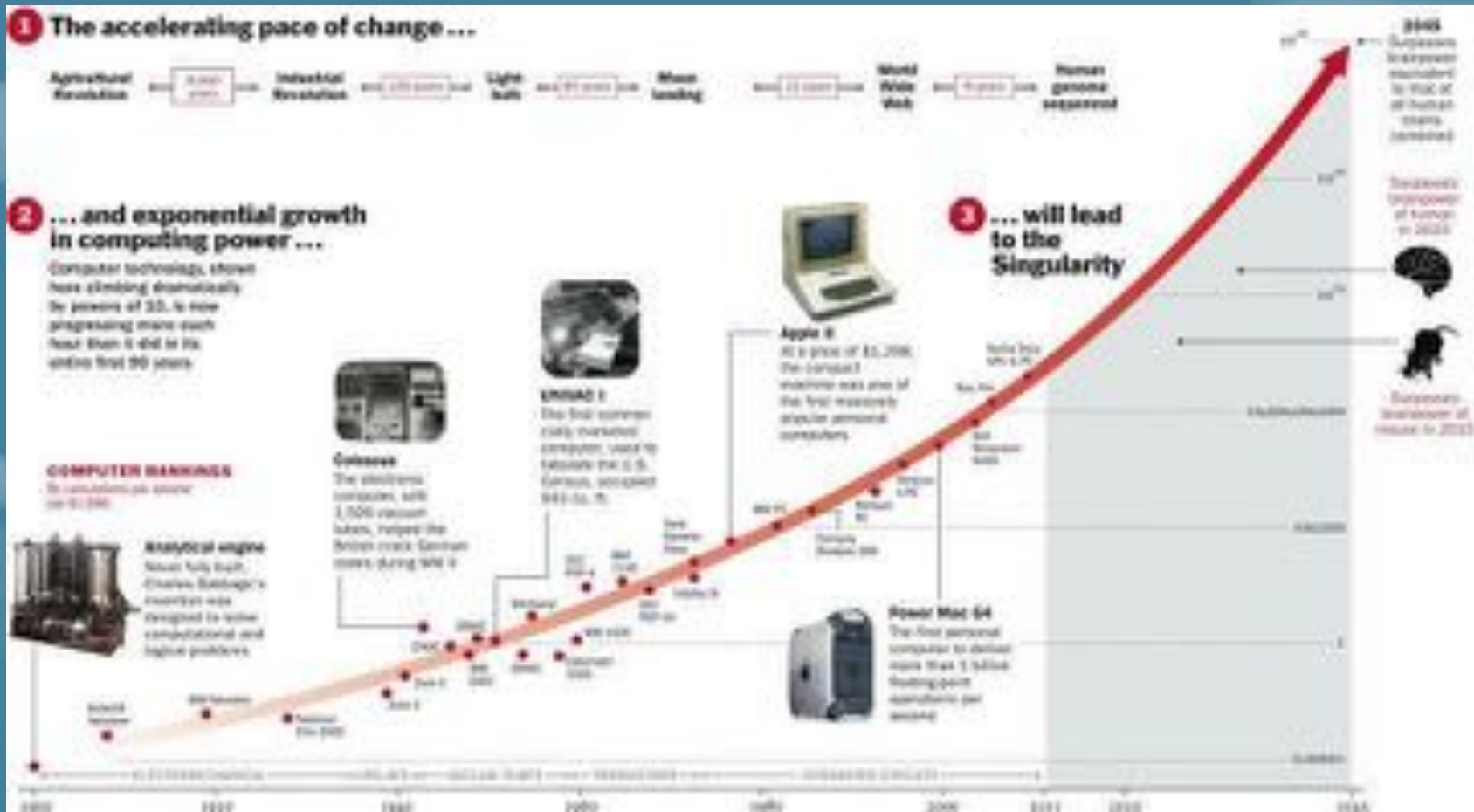
**Apple II**  
At a price of \$1,299, the compact II desktop was one of the first mass-produced personal computers.



**Power Mac G4**  
The first personal computer to deliver more than 1 billion floating-point operations per second.

# 3 ... will lead to the Singularity

- 2040: Singularity is expected to take 50% of human time (combined)
- 2050: Estimated lifespan of humans is 2000
- 2060: Estimated lifespan of humans is 2000
- 2070: Estimated lifespan of humans is 2000
- 2080: Estimated lifespan of humans is 2000
- 2090: Estimated lifespan of humans is 2000
- 2100: Estimated lifespan of humans is 2000



An analysis of the history of technology shows that technological change is exponential, contrary to the common-sense 'intuitive linear' view.

**So we won't experience 100 years of progress in the 21st century—it will be more like 20,000 years of progress (at today's rate).**

The 'returns,' such as chip speed and cost-effectiveness, also increase exponentially. **There's even exponential growth in the rate of exponential growth. Within a few decades, machine intelligence will surpass human intelligence, leading to the Singularity—technological change so rapid and profound it represents a rupture in the fabric of human history.**

# *Singularity by ~~2045~~ 2035?*

The technological **singularity**, an age when machine intelligence surpasses human intelligence, is now expected to take place in **2035**, 10 years earlier than initially predicted. This was the word from Shayne Manne, co-CEO of SingularityU Africa and co-founder of experiential brand agency Mann Made.



# *What is SeaChange?*

- In Shakespeare's *The Tempest*, a *sea-change* is a change brought about by sea: *Full fathom five thy father lies ... / Nothing of him that doth fade / But doth suffer a sea-change.*
- Idiomatic expression which denotes a substantial change in perspective, especially one which affects a group or society at large. It is similar in usage and meaning to a paradigm shift and may be viewed as a change to a society or community's zeitgeist. A profound transformation.

# Before we reach the Singularity, we will have SeaChange

- Next 15 years most profound and most disruptive in all human history
- **Breakdown** of old systems that no longer serve us such as:
  - Education (agrarian model)
  - Government / antitrust applied to Social Media (a digital economy)
- **Breakthroughs** in technology, biotech, fin-tech, value economy
- Rapid Advancements in G/N/R
  - Genomics, Nanotechnology, Robotics (including AI)

- **Promise and Peril**

- The same advancements in immune therapy that can cure cancer could be weaponized to create a viral bio-weapon

- Same advancement in artificial intelligence that could enable self-driving cars, or self-flying drones may be precursors to lethal autonomous robots

- **Pivotal moment in human history**

- **Nothing less than the future of human existence is at stake**

## What is our trajectory?

- Many possible Futures exist at this moment
- Because of the exponential nature of the acceleration of technology - we aren't going to have the benefit of hindsight
- EPA formed in 1970 / prior to that we allowed factories to dump toxic waste in our oceans / allowed cars to emit toxic fumes into the air

- **Last half of the 20<sup>th</sup> Century Major Scientific breakthroughs have come out of entities could afford expert talent/human resources and supercomputers:**

- Government Agencies / DARPA / NASA
- University Institutions / MIT / RIT / Stanford
- Major Corporations / Bell Labs / IBM

- **Inherent to these “Titans of innovation” are mechanisms for checks and balances**

- boards of directors, stakeholders, board of regents, and regulatory agencies.

- Today, we have the same processing power in our cell phones as put a man on the moon. And today, a VC funded start-up in Silicon Valley has the tools accessible to edit DNA with CRISPER.

# *What is a Superhero?*

A **superhero** is a heroic fictional character typically possessing supernatural or superhuman powers, who is dedicated to fighting the evil of their universe, protecting the public, and battling super-villains.

*We are ALL Superheroes!*

# *What we can do:*

- As Dimitry Says – “start from the inner-knowing of immortality”
- Pay attention to the world around you
  - Be aware of digital distractions
  - Facebook and Social media (dopamine response)
  - News / Fake News and Deep Fakes (amygdala fight or flight response)
  - Be aware of your digital identity and protect your privacy
  - Participating in 10-year challenge was designed to teach FB AI

# *What we can do:*

- Keep Humanity in the center of the conversation
- Human created tools / and humans created AI / we need to keep humans at the center of the future that we create and not let technology create our future by default / don't relegate our future to the machines
- Movement towards Human-Centered Internet
- Privacy, Digital Identity



# *The pace of change itself is accelerating*

And in equal measure, the age at which a human can make a contribution to humanity is getting growing on each end of the spectrum.  
Especially, young children.

- Ray wrote *Danielle: Chronicles of a Superheroine* to tell the world that we are ALL superheroes capable of making an impact for good in the world.
- To solve the biggest problems facing humanity and to design the future that we all want to live in.



*... a brilliant star,  
Danielle, who shines a  
light forward to a future  
with more peace, more  
love, and more  
understanding...*

*- Stevie Wonder*



Ray Kurzweil, legendary inventor and author of New York Times bestsellers *The Singularity Is Near* and *How to Create a Mind*, has created inventions and ideas that have changed human civilization. PBS called him “one of the revolutionaries who made America,” and *Inc.* magazine named him “Edison’s rightful heir.” Now Kurzweil has created a novel, and an unforgettable character—Danielle—to help convey some of his most important ideas. *Danielle: Chronicles of a Superheroine*, tells the story of a precocious girl who uses her intelligence and accelerating technologies to solve the world’s grandest challenges.

This companion book to the novel, *A Chronicle of Ideas: A Guide for Superheroines (and Superheroes)* is a nonfiction guide to the scientific, technological, medical, entrepreneurial, political, historical, literary, musical, philosophical, and psychological ideas that animate the world of Danielle, the novel’s protagonist (and the world of the novelist too!). It provides Danielle’s—and Kurzweil’s—unique spin on 282 diverse concepts presented in the novel, everything from string theory to Jimi Hendrix to cancer stem cells to Alice’s Adventures in Wonderland.

The ideas in the novel are tagged with entry numbers. It is suggested that the novel be read side by side with the entries in this companion book.

## *Danielle: Chronicles of a Superheroine* emerged as a National Best Seller and has received multiple awards



Recipient of the 2019 Moonbeam Children's Book Award GOLD Medal in the category of Health Issues



#1 Amazon Best Seller (*May 2019*) in multiple categories including New Release, Science, Nature, Environment for hardcover, Kindle and audiobook



USA Today Top 150 (*May 2019*) #125 of All Books, Adult & Young Adult, Fiction & Non-fiction combined



**BESTSELLER**

#7 Publishers Weekly (*May 2019*) in the Young Adult category, Fiction & Non-fiction combined



2019 recipient of the NABE Pinnacle Book Achievement Award, First Place Winner of Best Book in the Young Adult category Fiction & Non-fiction combined

BOYS: <https://www.youtube.com/watch?v=d1ptXVSZqjY>

GIRLS:

<https://www.youtube.com/watch?v=rnp5soSaMCw>