

## Kurzweil's Conclusions

(slide added by MM)

### Extrapolating from these exponential trends:

In the near future, there will be a *singularity* seen in progress on computing and on understanding the brain.

Within next 20 years or so, we will have computers fast enough and with enough memory to simulate the brain accurately.

## From R. Kurzweil, The law of accelerating returns (2001)

**Singularity:** "technological change so rapid and profound it represents a rupture in the fabric of human history. The implications include the merger of biological and nonbiological intelligence, immortal software-based humans, and ultra-high levels of intelligence that expand outward in the universe at the speed of light."

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"Although exponential trends did exist a thousand years ago, they were at that very early stage where an exponential trend is so flat that it looks like no trend at all.... Today, in accordance with the common wisdom, everyone expects continuous technological progress and the social repercussions that follow. But the future will be far more surprising than most observers realize: few have truly internalized the implications of the fact that the rate of change itself is accelerating."

"Because we're doubling the rate of progress every decade, we'll see a century of progress--at today's rate--in only 25 calendar years."

"In 1993, Vinge presented a paper to a NASA-organized symposium which described the Singularity as an impending event resulting primarily from the advent of "entities with greater than human intelligence," which Vinge saw as the harbinger of a run-away phenomenon."

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## Could Kurzweil be right?

*Heavier-than-air flying machines are not possible.*

— Lord Kelvin, 1895

*Airplanes have no military value.*

— Prof. Marshal Foch, 1912

*I think there is a world market for maybe five computers.*

— IBM Chairman Thomas Watson, 1943

*It would appear that we have reached the limits of what is possible to achieve with computer technology.*

— John von Neumann, 1949

*640,000 bytes of memory ought to be enough for anybody.*

— Bill Gates, 1981

(Quoted in D. R. Hofstadter, "Moore's law, artificial evolution, and the fate of humanity", 2005.)