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Application of Artificial Super Intelligence in Investing and the Importance of Compounding and Income Tax Reduction

Importance of Avoiding Income Tax

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- Seeking to Reduce or Avoid Income Tax Is Sensible Only If There Is Positive Taxable Income or Gain
- Returns Need to be More than De Minimis
- Higher the Return the More Important the Reduction of Avoidance of Income Tax Becomes
- Risks and Consistency Once High Returns Are Achieved

Importance of Compounding

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- Importance of Compounding
  - Albert Einstein's First Theorem: Compounding is the most powerful force in the universe
    - My family has 2 descendants per generation (2 children, 4 grandchildren, 8 great grandchildren and so on)
    - Your family has 3 descendants per generation (3 children, 9 grandchildren, 27 great grandchildren and so on)
    - In 20 generations, I have one million descendants living
    - In 20 generations, you have 3.5 billion descendants living and your attributes overwhelm and wipe out mine

Compounding & Returns

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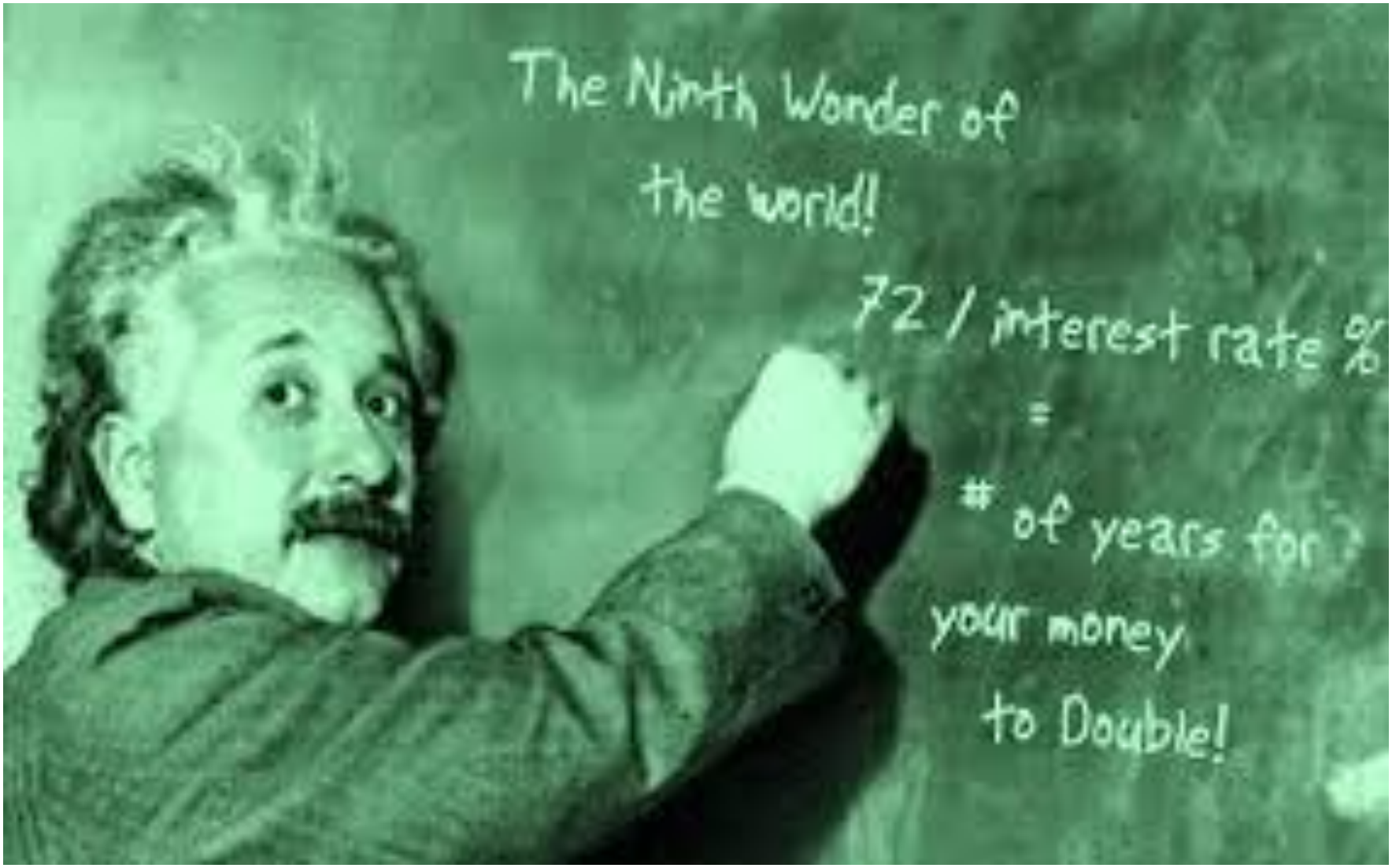
- **Importance of Compounding and Level of Returns**
  - **Which Return Would You Prefer: 5% Compounded or 10% Simple (Non-Compounded)?**
  - **Simple vs Compounding return – Exhibit 1**


The Ninth Wonder of
the world!
72 / interest rate %
=
# of years for
your money
to Double!

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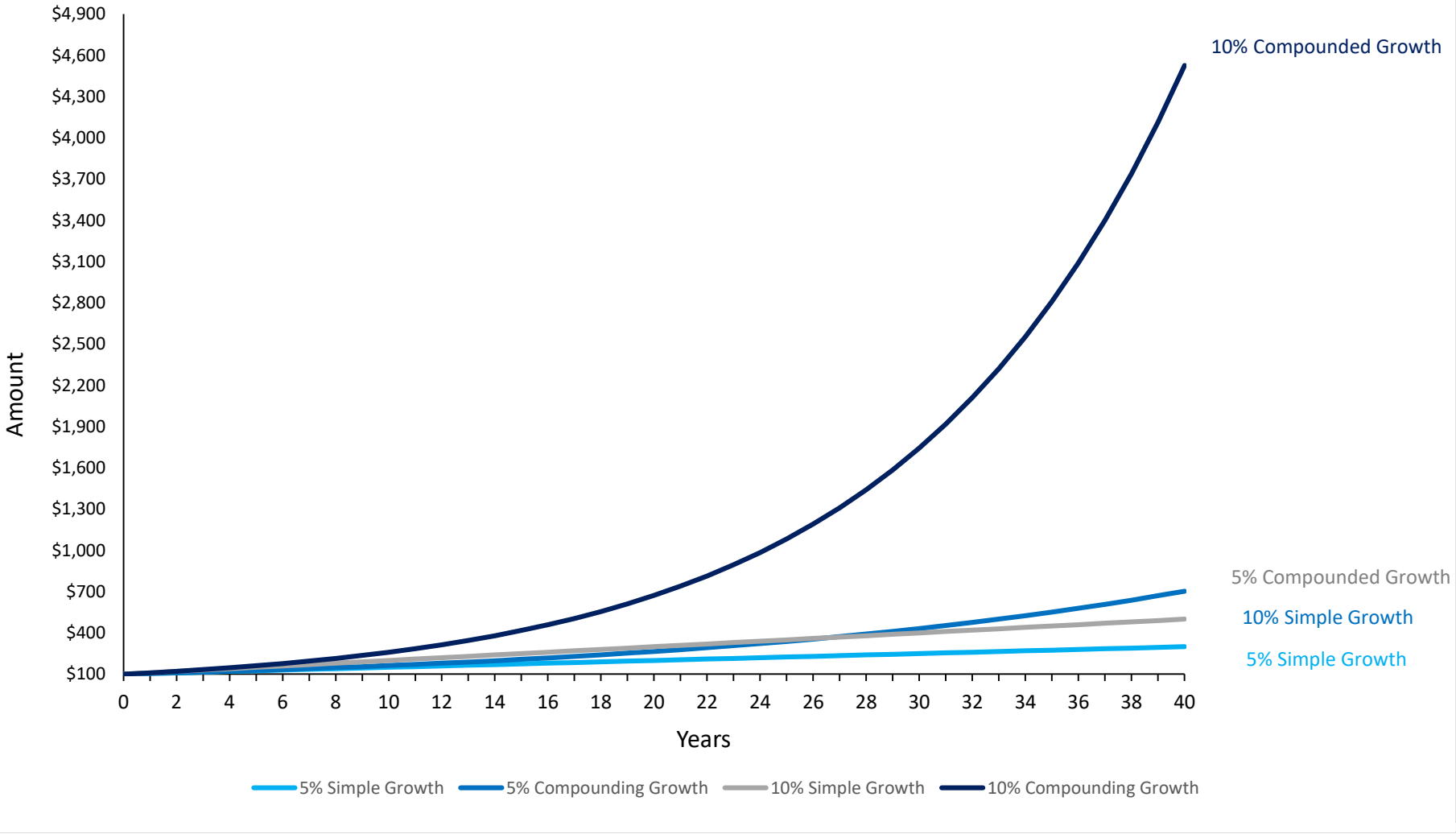
Simple vs. Compounded Return



Corollaries in Compounding

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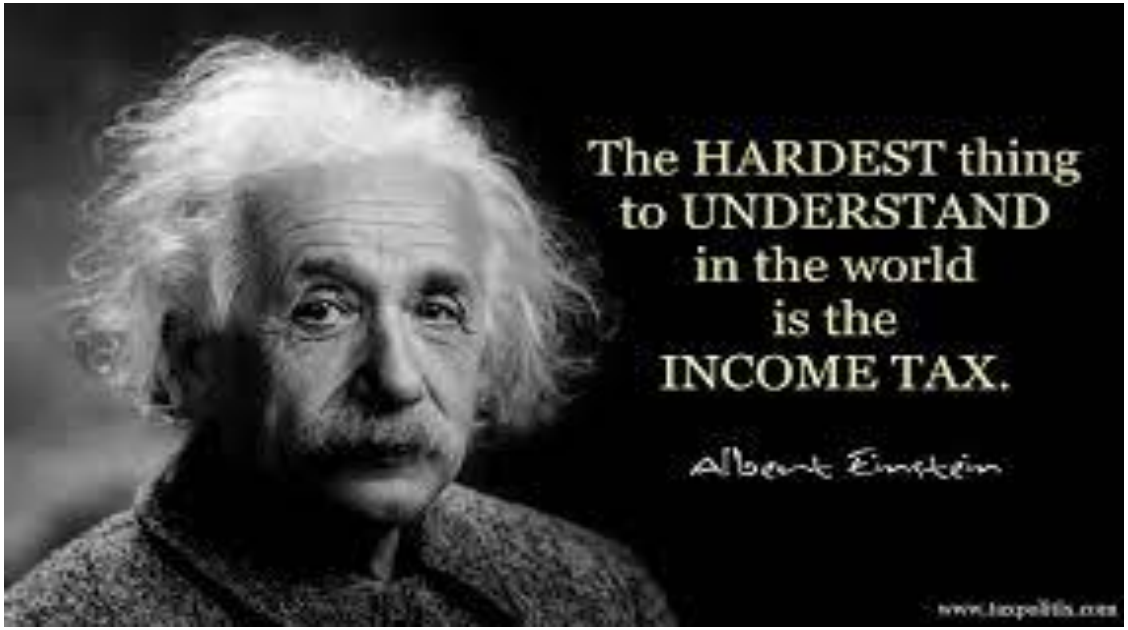
- **Again, the Importance of Compounding: Some Corollaries**
  - **The Longer the term, the greater the effect of compounding**
  - **The Higher the annual return, the greater the relative increase in wealth from Compounding**

- **Albert Einstein's Other Theorem: The hardest thing in the world to understand is the income tax**
  - The Effects of Taxation on Compounded Returns After 20 years – Exhibit 2



Returns and Taxation – What the Numbers Tell Us

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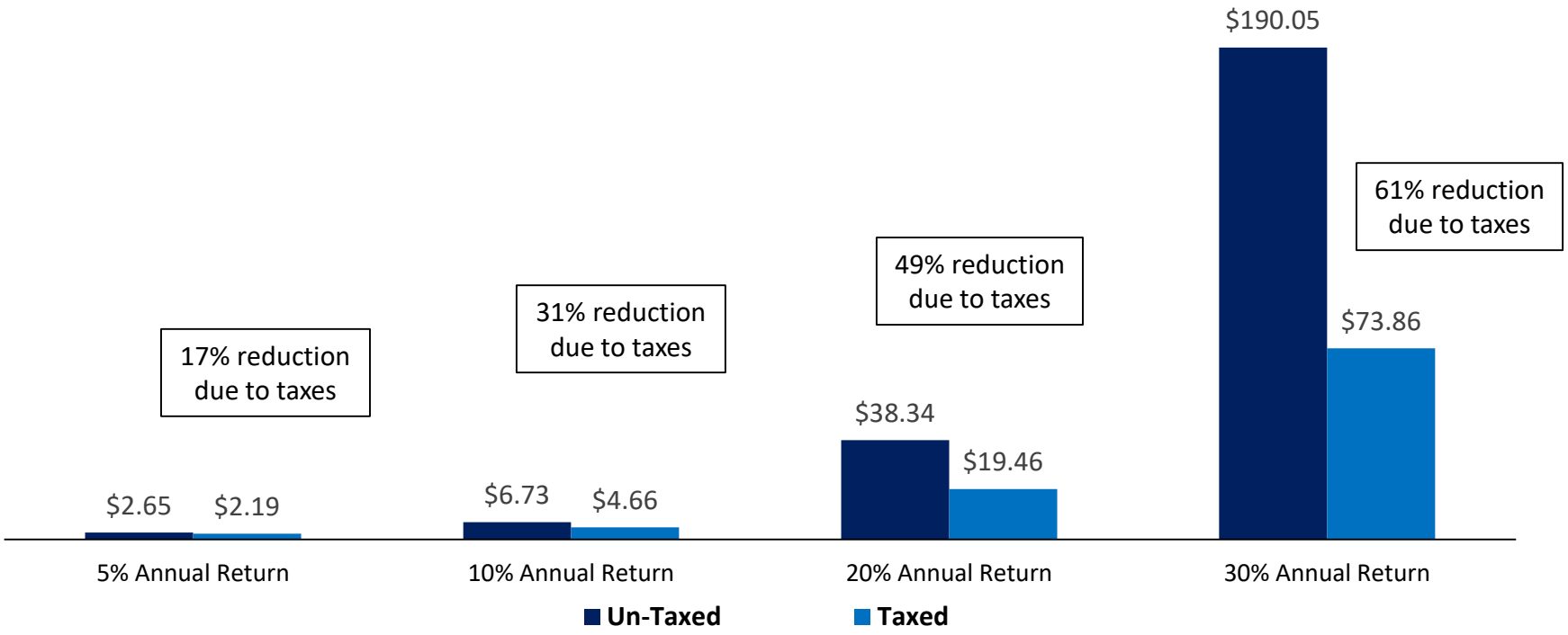
Effects of 20% Annual Taxation on Compounded Returns After 20 Years



Returns and Taxation – What the Numbers Tell Us

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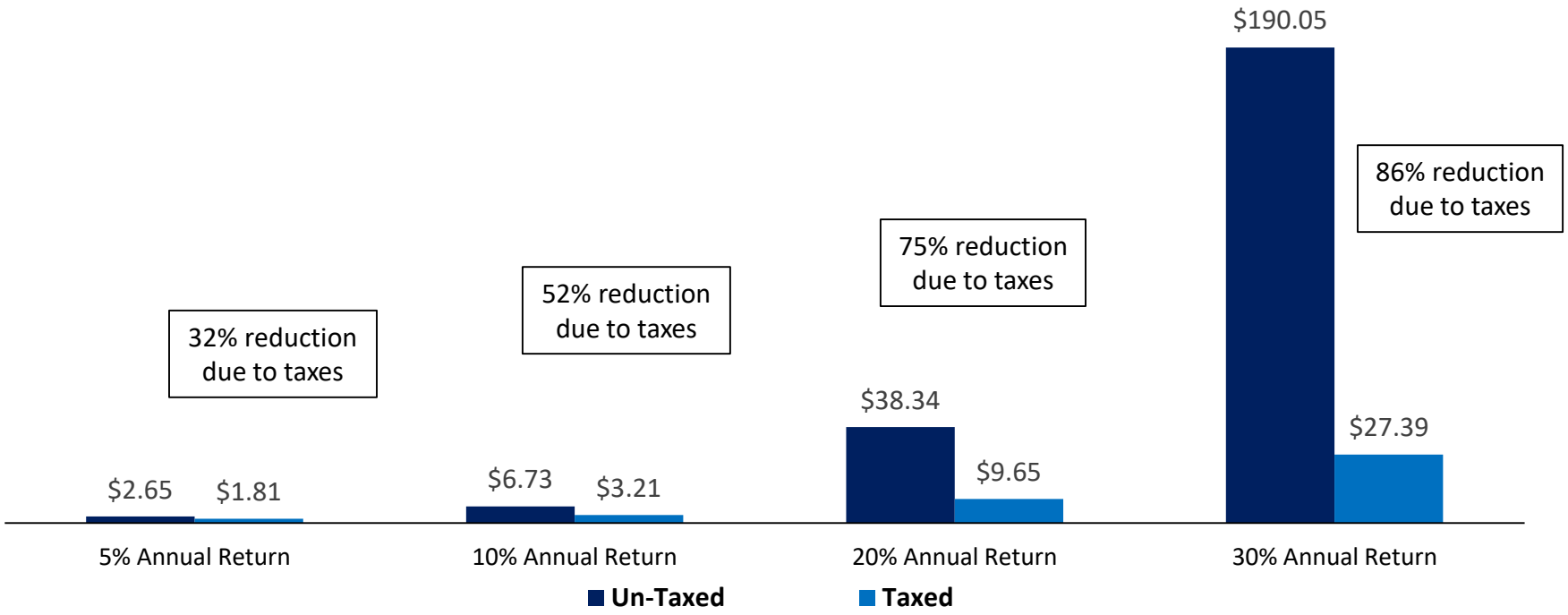
Effects of 40% Annual Taxation on Compounded Returns After 20 Years



Basic Principles of Tax Reduction

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- How to Reduce or Avoid Tax Erosion
- Some Basic Principles:
  - Deferral of taxation is beneficial but only if returns are compounded and all other things are equal
  - Example: An employee is entitled to $1 million of compensation for 2015. The employee is in a 40% income tax bracket. If the employee is currently taxed in 2015 on that income, he or she will net $600,000, which could be spent or saved in 2015. Assume the employee could and does postpone the receipt of the income until 2016 when it still will be taxed at 40% so he or she would again net $600,000, which could be spent or saved in 2016. Assuming no earnings on the net (after tax) income, it seems unimportant whether the income is received in 2015 or 2016 although, in the real world, one almost certainly will want income (or any other wealth) as early as possible (again, if all other things are equal). That is either because the receipt of the income in 2015 will reduce expending other resources in 2015 or because it will be invested.

Deferring Taxation

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- More on Deferral
  - Example Continued: The employee is entitled to $1 million of compensation. The employee is in a 40% income tax bracket. If the employee is currently taxed on that income, he or she will net $600,000. If that $600,000 is invested and earned six percent (6%) over the next year, it will earn $36,000 which it is assumed also may be subject to a 40% income tax, meaning that the employee will have $624,000 net after the year. If the taxation of the $1 million of compensation income were deferred for a year and during that year earned six percent, the taxpayer would be entitled to $1,060,000 after one year. If that then also were subject to a 40% income tax, the employee would net $636,000 or $12,000 more than if the taxation had not been deferred.
  - Essentially, the enhanced wealth is attributable to earning a return on the deferred tax

Observations about Taxation

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- The higher the effective rate of annual taxation, the greater the erosion of wealth
- The higher the return, the more the return is eroded by current income tax
- Blattmachr's Corollary: The Most Important Thing in Financial Planning Is Tax Free Compounded Returns

Conclusions on Deferral of Taxation

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- **Deferral of Taxation Is Important If There Are Earnings on the Deferred Amount (Which May Be Attributed to Earnings on the Tax that Is Deferred), If All Other Things Are Equal**

Tax Reduction by Category of Investment

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- From Worst to Best: (1) Taxable Interest, short-term capital gain and other "ordinary" income (40% tax rate), (2) Long-term capital gain and qualified dividends (20% tax rate), (3) Tax free

- But the market tends to "even" out (net) returns based, in part, on taxation of the return
  - Which is better: 10% annual taxable return or 6% annual tax free return?

  - At a 50% tax bracket, the net (after tax) return on the 10% taxable return is 5% which is less than the 6% tax free return

  - At a 40% tax bracket, the net (after tax) return on the 10% taxable return is 6%, the same as the 6% tax free return

  - At a 30% tax bracket, the net (after tax) return on the 10% taxable return is 7% which is more than the 6% tax free return

By and Hold Investment Strategies

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- Buy and Hold
  - Advantages of a permanent buy and hold investment strategy
    - Complete tax postponement
    - Irrelevant if no growth (and only current return, such as interest or dividends)
    - Income tax free "step up" in basis at death (if no IRD)
  - Disadvantages of a buy and hold investment strategy
    - Missing out on other (better) investment opportunities
    - Tax cost of cashing out to change investments (but that may be the case whenever the investor wishes to change investments) except when the investment's value has not appreciated (e.g., municipal bond or Section 1031 real estate)

Note: The Tax Law Will Change Again and Again and….

"Qualified" Retirement Vehicles

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- IRAs and qualified retirement plans
  - Advantages
    - Tax deferrals (no tax cost to change investments)
    - income tax deductible contributions (so compounding and deferral on the income tax not current paid)
    - Avoiding tax to change investments
    - Asset protection (except some IRAs in some states)
    - Avoiding state/local income tax if change in residency (in some cases)
  - Disadvantages
    - All taxed at ordinary income tax rates
    - No estate tax planning available
    - Penalty if under age 59 ½
    - Complications for disposition at death
    - Complications on reaching at 70 ½ +
    - Limitations on investments
  - Conversion to a Roth IRA: At least a dozen factors to consider

Tax Deferred Annuities

- Advantages
  - Tax deferral
  - Limitation on investment choice (unless PPVA)
  - Avoiding tax to change investments
  - Asset protection (in some states)
  - Avoiding state/local income tax if change in residency (in some cases)
- Disadvantages
  - All taxed at ordinary income tax rates
  - Penalty if under age 59 ½
  - No step up in basis at death (IRD)
  - Potential Investor Control issues

Charitable Remainder Trusts

- Advantages
  - Tax deferral/avoidance on gain inherent in contributed assets
  - Tax deferral
  - Avoiding tax when changing investments
  - Partial charitable deduction
  - Flavor of income does not change
- Disadvantages
  - Loss of trust assets to charity when trust ends
  - UBTI tax (100%+)
- Comparison to tax deferred annuities

Life Insurance

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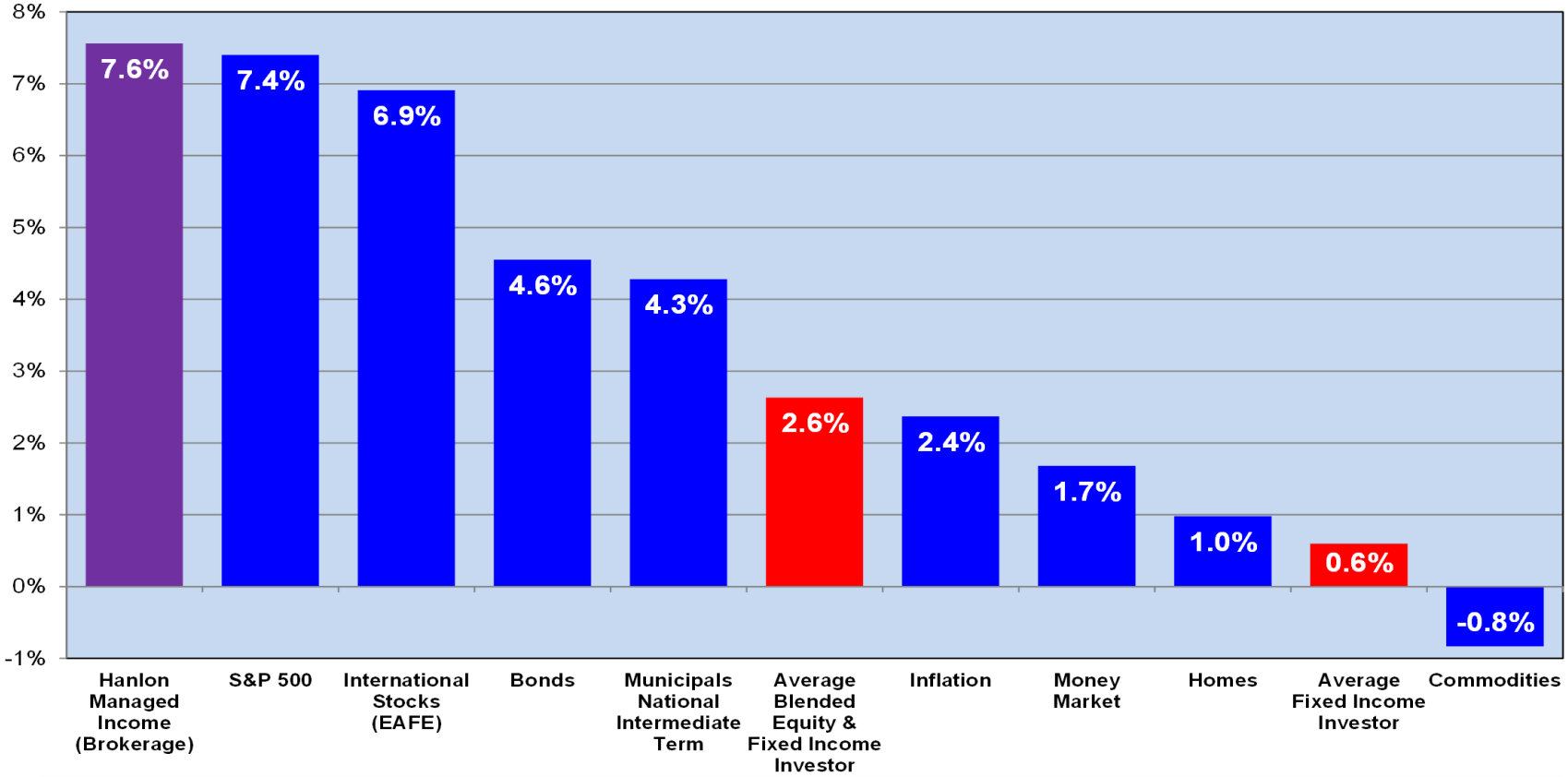
- Advantages
  - Easy estate tax avoidance
  - Easy asset protection (in most states)
  - Complete income tax avoidance and tax free receipt on death
  - Can borrow the income tax free before death if not a MEC
- Disadvantages
  - Term insurance, premium tax and annual insurance company costs
  - Limitations on investment choice unless PPLI but then owner control issues
- Blattmachr's Formula: Anticipated return must exceed the quotient of annual cost (in basis points) divided by anticipated income tax rate (in basis points) on the gain/income the investment produces
- Example: Anticipated annual cost (100 basis points or one percent) divided by anticipated annual tax rate on the return (25 percent) is 4. Hence, consider the PPLI policy only is the anticipated annual return exceeds 4 percent

10-Year Annualized Returns (2004-2013)



Past performance is no guarantee of future results. Indices used are as follows; EAFE: MSCI EAFE index, Bonds: Barclays Aggregate Bond Index, Municipals National Intermediate Term: Barclays Capital US Municipal Bond, Inflation: CPI-U, Money Market: Vanguard Money Market Fund, Homes: Median Sales Price of Single Family Homes, Average Equity & Fixed Income Investor: Dalbar calculation utilizing the net of aggregate mutual fund sales, redemptions and exchanges each month as a measureof investor behavior Returns are annualized and total return where applicable. Sources: Dalbar, Bloomberg, Morningstar, and Fast Track. The Hanlon Managed Income model performance is representative of our brokerage portfolios in this allocation

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Conclusions

- High Compounded Returns and Low Taxation are the Key to Building Wealth
- The Greater the Return the More Important Is Compounding
- The Greater the Return the Greater the Erosion from Taxation
- Which Method Is Best to Avoid/Reduce Tax is Dependent Upon Several Variables

Artificial Super Intelligence

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William Bryk, "Artificial Superintelligence: The Coming Revolution," Harvard Science Review (December 4, 2015):

"The science fiction writer Arthur Clarke famously wrote, 'Any sufficiently advanced technology is indistinguishable from magic.'

'Yet, humanity may be on the verge of something much greater, a technology so revolutionary that it would be indistinguishable not merely from magic, but from an omnipresent force, a deity here on Earth. It's known as artificial super-intelligence ("ASI"), and, although it may be hard to imagine, many experts believe it could become a reality within our lifetimes."

2001: A Space Odyssey

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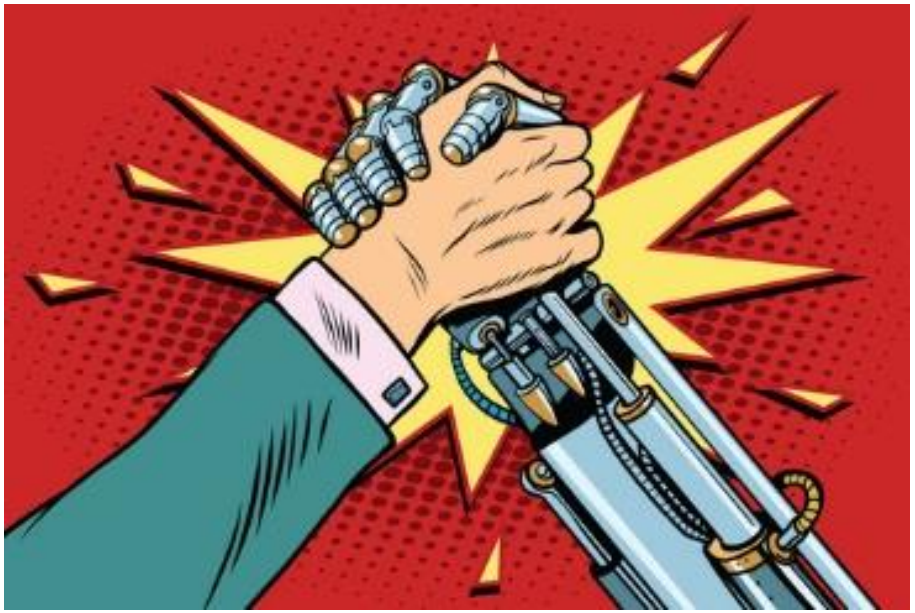
2001: A Space Odyssey **is a 1968 epic science-fiction film produced and directed by Stanley Kubrick and is based upon a short story by Arthur C. Clarke. Today, *2001: A Space Odyssey* is widely regarded as one of the greatest and most influential films ever made.**

The film follows a voyage to Jupiter with the sentient (self-aware) computer HAL (Heuristically programmed ALgorithmic computer) after the discovery of a mysterious black monolith on the moon affecting human evolution. HAL 9000 is a fictional character and the main antagonist in the film. HAL is a sentient computer (or artificial general intelligence) that controls the systems of the *Discovery One* spacecraft and interacts with the ship's astronaut crew.

In the film, HAL became operational on 12 January 1992 at the HAL Laboratories in Urbana, Illinois.

Jeff Glickman was teaching advanced physics to PhD candidates at the University of Illinois Urbana Champaign when he was 16 and running the AI Lab there.

Artificial intelligence (AI) software outperforms lawyers (without subject matter expertise) in matchup (ABA Journal)



During the last week of October, legal technology company CaseCrunch held an AI-versus-lawyer competition, and the machine came out on top.

The competition pitted over 100 attorneys from firms like DLA Piper and Allen & Overy against CaseCruncher Alpha to predict outcomes of just under 800 real, historic insurance misselling claims. The goal was to correctly determine if the claim would succeed or not.

According to CaseCrunch's website, the software predicted outcomes with almost 87 percent accuracy, while the lawyers were 62 percent correct.

- **Even AI tightens the noose around lawyers' "expertise". Imagine what ASI will do.**

Introduction

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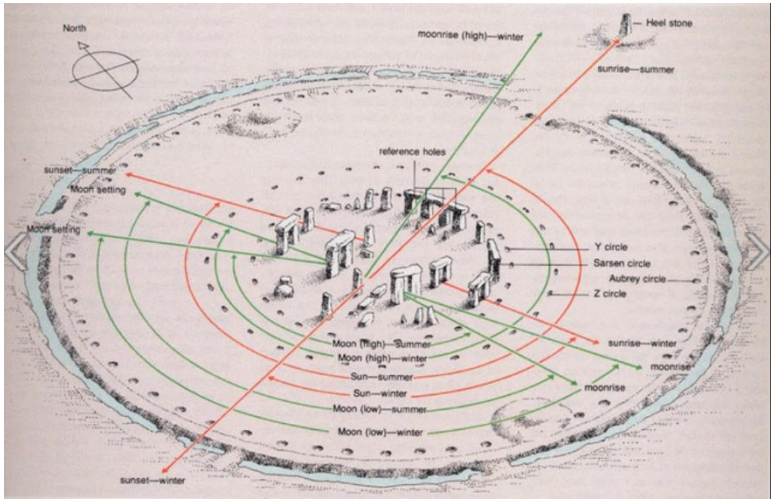
- Investing the markets has been limited to value investing, technical analysis, quantitative analysis and high frequency trading, sometimes involving Algorithms (“algos”) and Machine Learning (“ML”).
- The common thread: These methods locate and exploit mispriced assets.
- But returns in excess of these methods are possible if you understand the markets. This is beyond human cognition, but within the grasp of emerging computational methods:

- Artificial Superintelligence:
  “…intelligence far surpassing that of the brightest and most gifted human minds”
  [https://en.wikipedia.org/wiki/Superintelligence]

Introduction

- The path to Artificial Superintelligence has spanned millennia, driven by humanity's desire to explain the inexplicable. This path begins with clockwork mechanisms.
- Understanding the seasons and heavenly motions were key to surviving the transition from hunter-gatherers to agrarian societies: As hunter-gatherers it was possible to follow the food but as an agrarian society it was necessary to know when to plant and harvest.
- Astronomical alignment, which could be used to predict the seasons, emerged in cultures all around the world including at Stonehenge, the Pyramids, and in Mayan culture.



Precursors

- Large monuments were constructed, often intertwined with religious motivations, incorporating the means to measure star locations.
- Over time, studying the history of star locations enabled the understanding of star motions, improving the ability to predict the timing of the seasons.
- The first major breakthrough was the reduction of monuments to mechanical mechanisms. This was the precursor of clocks, both of which are types of analog calculation.

Precursors

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- Discovered in 1901 and dated to approximately 150BC is the Antikythera mechanism, believed to be an astronomical calculator of Greek origin. It is the earliest known clockwork mechanism in the western world.
  [https://en.wikipedia.org/wiki/Antikythera_mechanism]

- Modern clocks emerged in 14th century Europe.
- Derivative mechanisms have been used to create motion instead of for astronomical observations and are known as “automatons”. This is the shared origin of robotics.

Precursors

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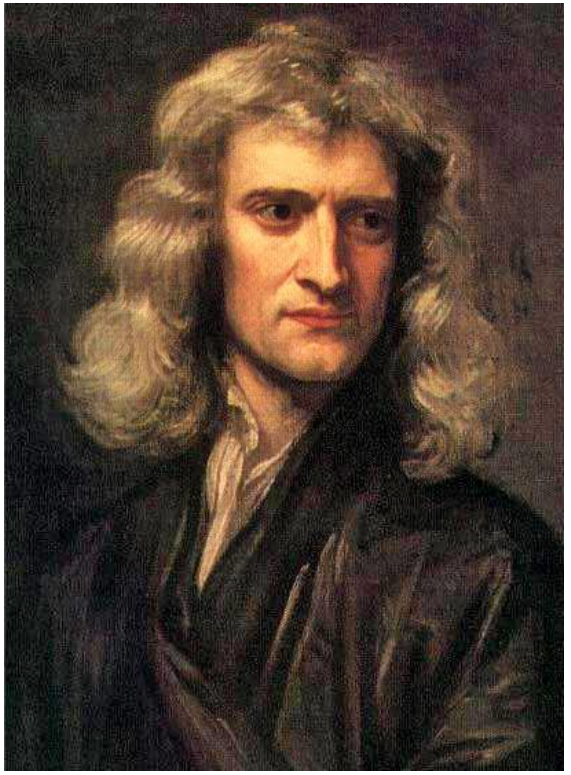
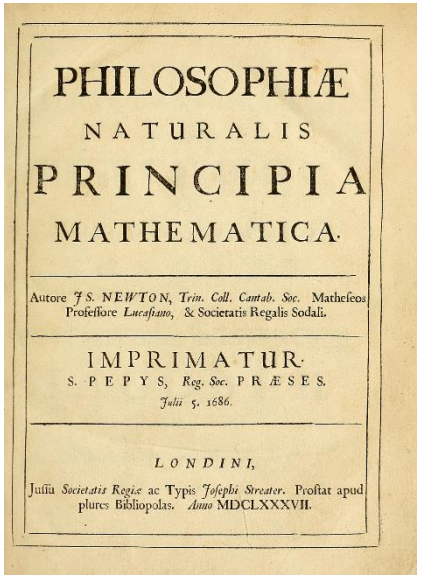
- **Sir Issac Netwon was the first to explain the motion of the heavens through mathematics in his book Philosophiæ Naturalis Principia Mathematica ("Mathematical Principles of Natural Philosophy") published in 1687.**

[https://en.wikipedia.org/wiki/Isaac_Newton]
[https://en.wikipedia.org/wiki/Philosophi%C3%A6_Naturalis_Principia_Mathematica]





PHILOSOPHIÆ
NATURALIS
PRINCIPIA
MATHEMATICA.

Autore *Is. NEWTON, Trin. Coll. Cantab. Soc.* Matheseos Professore *Lucasiano*, & Societatis Regalis Sodali.

IMPRIMATUR.
S. PEPYS, *Reg. Soc.* PRÆSES.
Julii 5. 1686.

LONDINI,
Juſſu *Societatis Regiæ* ac Typis *Joſephi Streater*. Proſtat apud plures Bibliopolas. *Anno* MDCLXXXVII.

Early Automated Calculations

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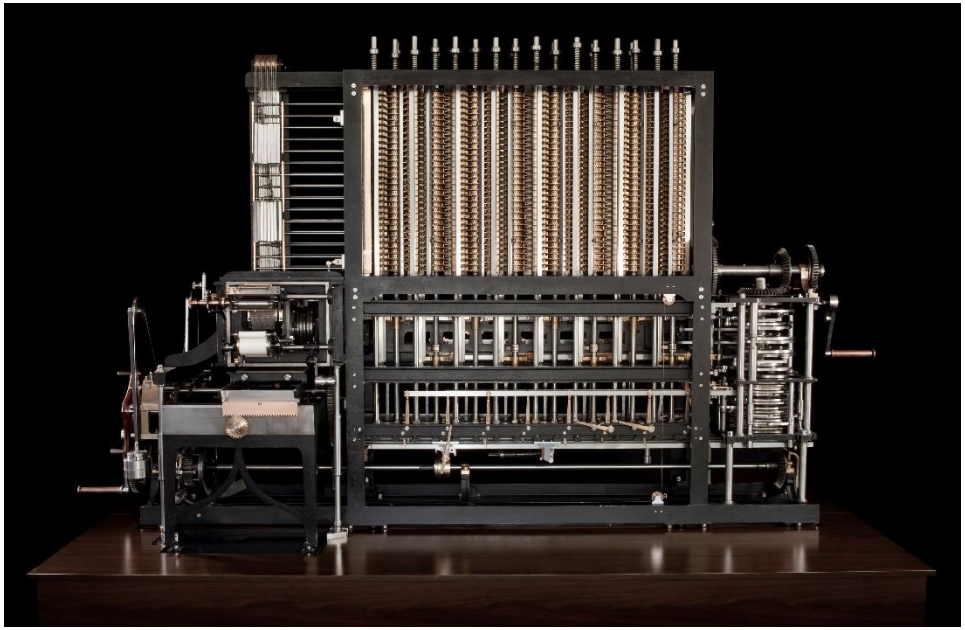
- In 1822 Charles Babbage proposed using the analog calculation capabilities of mechanical gears in his Difference Engine to compute polynomial functions such as are found in astronomical positions. The first design was not completed because it was too difficult to construct.
  [https://en.wikipedia.org/wiki/Difference_engine]

- This replica was completed in London in 2002 using Babbage's original plans and using modern manufacturing methods.



Early Automated Calculations

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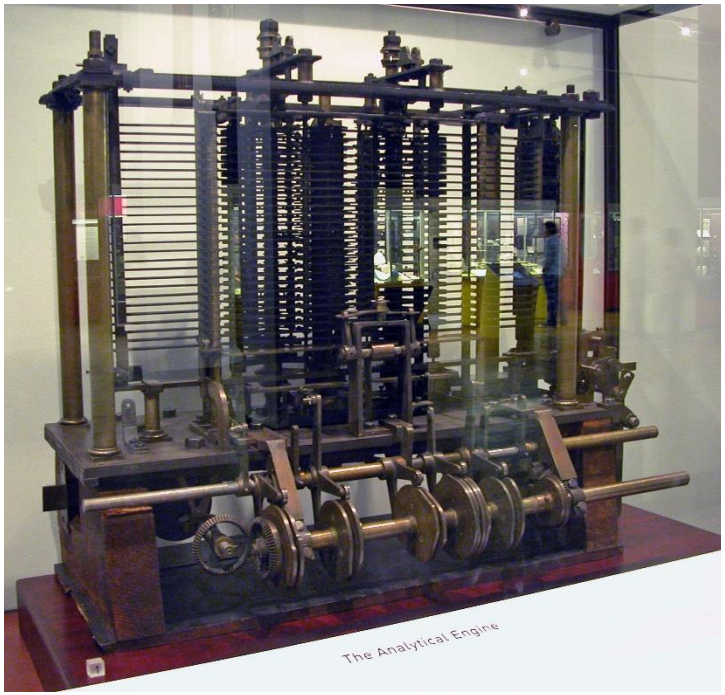
- Also comprised of mechanical gears, in 1837 Babbage proposed his Analytical Engine. This was the first design for a general purpose computer. Babbage only completed a small portion of a simplified design before his death in 1871.
  [https://en.wikipedia.org/wiki/Analytical_Engine]

- The trial portion of the Analytical engine built by Babbage is on display in London. To date, a complete functioning replica of Babbage's Analytical Engine has not been constructed.



Emergence of the Computer

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- **World War II was the impetus for the rapid development of computational capabilities beginning in 1941.**

First working computer, not electronic, no stored program

Zuse Z3 (Germany)	May 1941	Electro-mechanical	Program-controlled by punched 35 mm film stock
Atanasoff–Berry Computer (US)	1942	Electronic	Not programmable; linear system coefficients input using punched cards
Colossus Mark 1 (UK)	December 1943	Electronic	Program-controlled by patch cables and switches
Harvard Mark I – IBM ASCC (US)	May 1944	Electro-mechanical	Program-controlled by 24-channel punched paper tape (but no conditional branch)
Zuse Z4 (Germany)	March 1945 (or 1948)	Electro-mechanical	Program-controlled by punched 35 mm film stock
ENIAC (US)	July 1946	Electronic	Program-controlled by patch cables and switches
Manchester Baby (UK) [https://en.wikipedia.org/wiki/Analytical_Engine]	1948	Electronic	Binary program entered into memory by keyboard (first electronic stored-program digital computer)

John von Neumann paper

First complete working electronic, stored program computer

Emergence of the Computer

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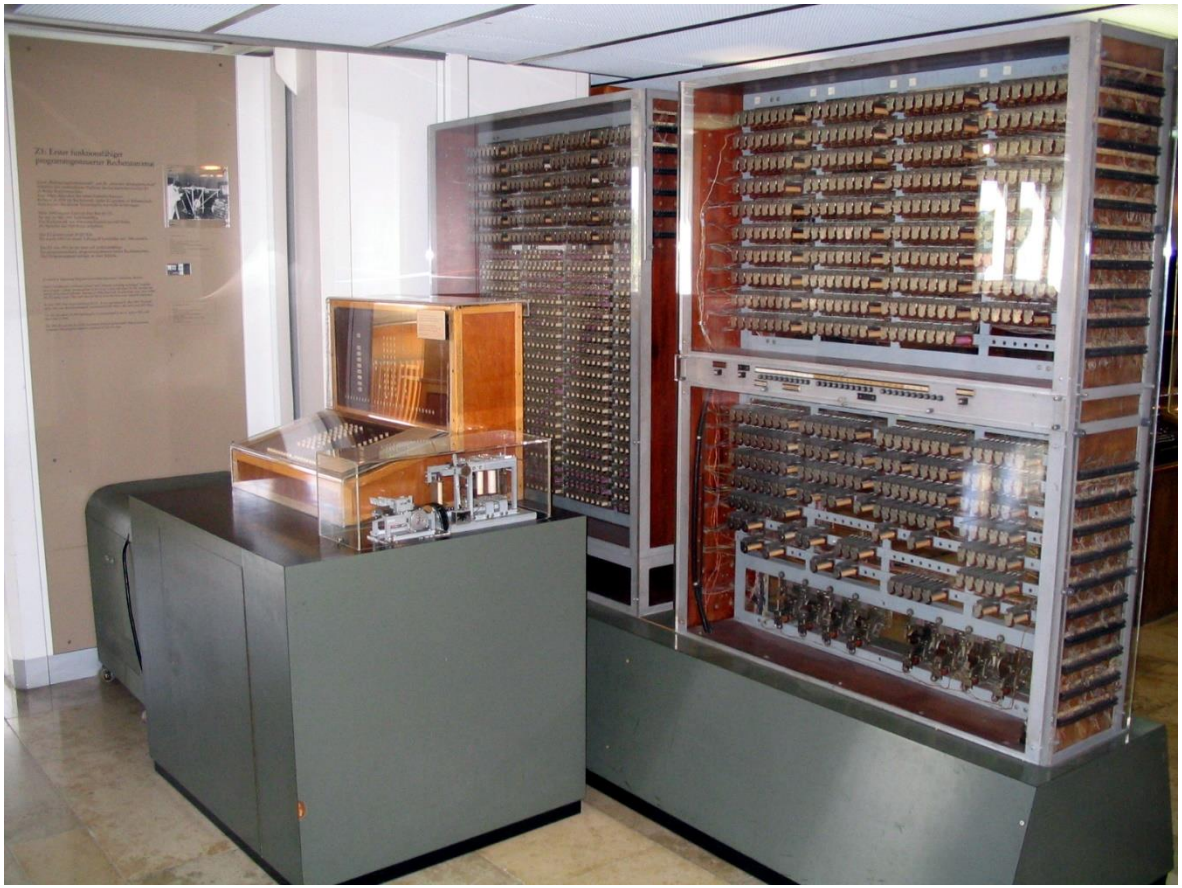

- **Zuse Z3 (1941). Replica built in 1960 on display in Munich, Germany.**
  [https://en.wikipedia.org/wiki/Z3_(computer)]

The von Neumann Architecture

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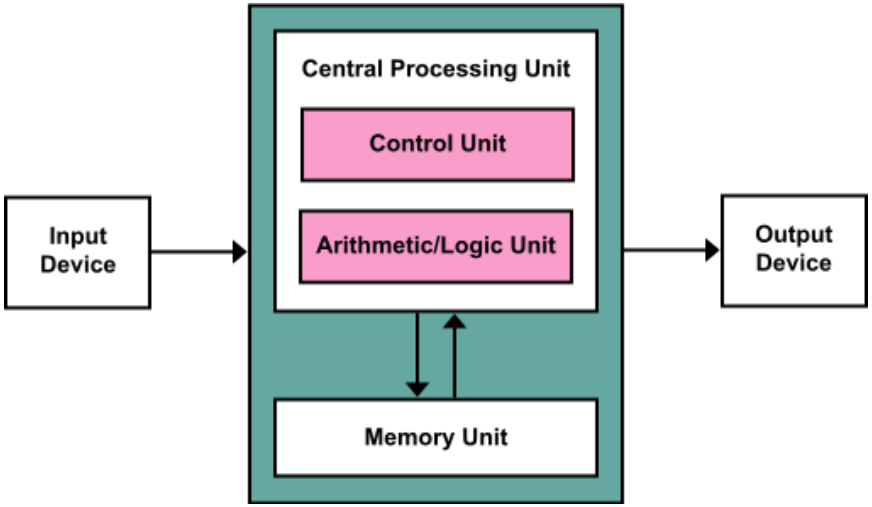
- In 1945 John von Neumann, a Hungarian-American mathematician at Princeton University, defined the modern computer in his paper "First Draft of a Report on the EDVAC."
- Known as the "von Neumann Architecture", nearly all succeeding computers since 1945 have descended or evolved from this blueprint.

[https://en.wikipedia.org/wiki/John_von_Neumann]
[https://en.wikipedia.org/wiki/Von_Neumann_architecture]



Emergence of the Computer

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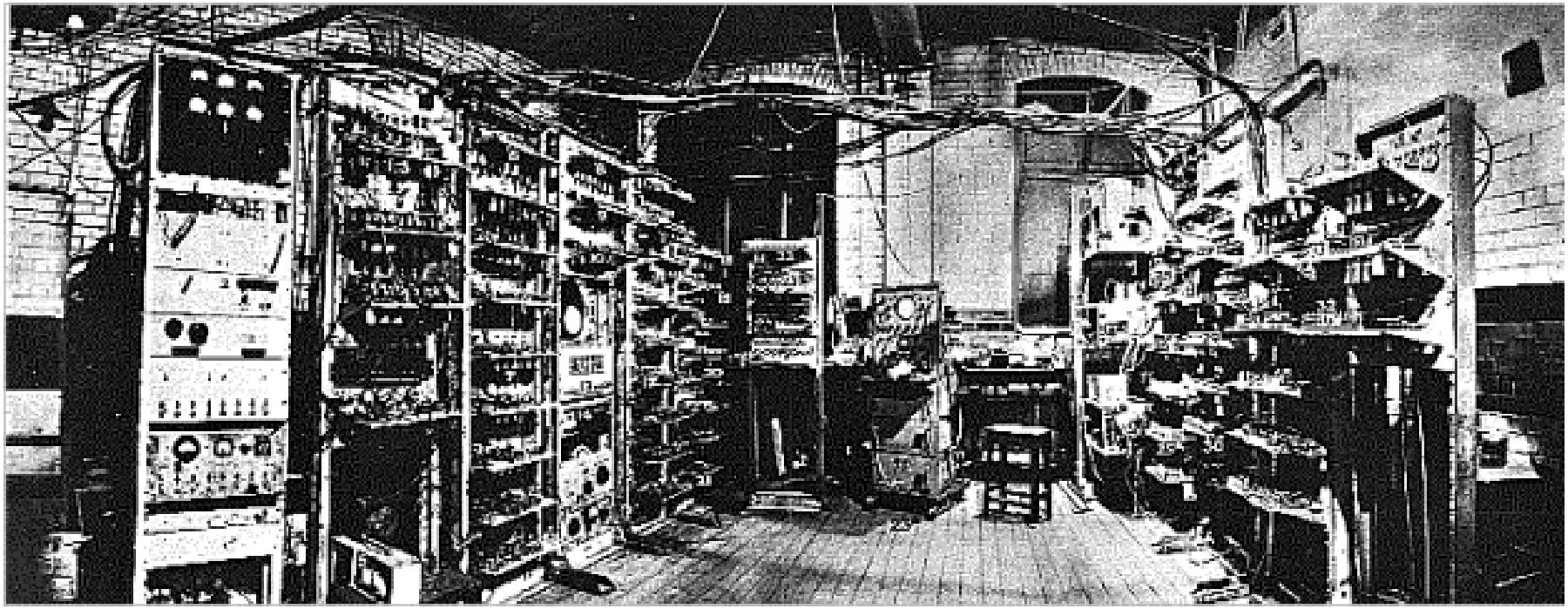

- **Manchester SSEM(a.k.a. Baby)(1948).**
  First complete stored program electronic computer.
  [http://curation.cs.manchester.ac.uk]

Performance Architectures

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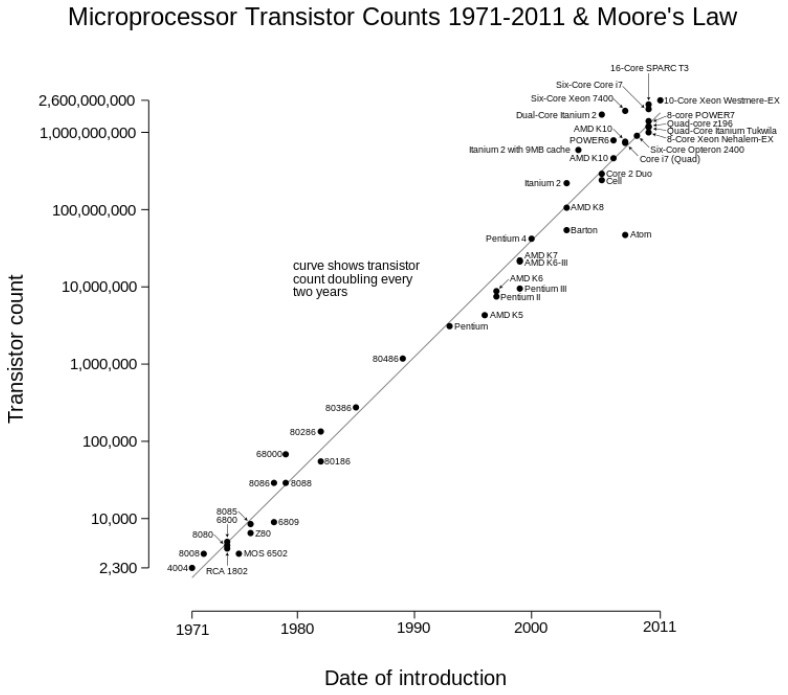
- Beginning in 1948 the first electronic computers began operating at 1,000 instructions (e.g. additions) per second.
- Since 1948 there has been an arms race to build ever faster computers. Each succeeding generation incorporates architectural enhancements (e.g. pipelines, split caches, parallel computing), which increases transistor counts, allowing us to tackle ever increasingly complex problems.
- The initial calculations in 1948 were ballistic trajectories. Since then, bookkeeping and accounting, simulations, chess, weather prediction, machine learning, artificial intelligence, self-driving vehicles, go.

IBM Deep Blue first beat a world chess champion, Garry Kasparov, February 10, 1996. Image Yvonne Hemsey/Getty Images

Supercomputing

- In 1965, Gordon Moore, the cofounder of Fairchild and Intel, defined Moore's law, which states that the number of transistors per square inch doubles approximately every two years.
  [https://en.wikipedia.org/wiki/Moore%27s_law]
- Therefore computers are becoming exponentially more powerful.
- Supercomputers are computers that are more powerful than their general purpose counterparts of their generation.



Computers on Wall Street

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- Computers had a humble beginning on Wall Street, however they have now infiltrated virtually every market function.
- Beginning with mundane tabulation and sorting, computers moved on to provide accounting support, data automation, eventually moving into the investment process including Calculating, Market Scanning, Data Analytics, Automated Trading and Electronic Exchanges.

Automating the Search for Price Discrepancies

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- Value Investing: e.g. automated review (filtering; market scanner) of fundamental data to identify underpriced stocks.
- Statistics: e.g. the expectation that trade distribution are gaussian; or the use of probabilities to predict price increase (e.g. Bayesian Models).
- Technical Analysis: e.g. the examination and interpretation of chart patterns.
- Physics: e.g. the application of physics models such as money being particles that flow through connected pipes.
- Quants: e.g. search for correlations between stocks such as oil and United Airlines; relationship between Dow and S&P 500 Indices; weather influence on commodity prices.
- Algorithmic Trading: automatic trading by programs based on criteria such as measured in market data.
- High Frequency Trading: e.g. trading very frequently but with only a small advantage; quickly getting in front of another order.

Artificial Intelligence

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- Artificial Intelligence(AI): any computational method that attempts to recreate intelligence using computers.
  - Artificial Neural Networks: a type of AI based on mathematical models of neurons found in humans, animals, etc.
  - Machine Learning: a type of AI; programs that learn from data without being programmed.
  - Deep Learning: a type of AI; broader machine learning with improved abilities to learn from data.

- AI typically approaches human capabilities.
- AI programming is static, causing AI to be restricted within these limits.
- AI in the markets has had limited success. The market is seen by people as a random walk and it is seen the same way by AI.

Artificial Superintelligence (ASI)

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- Artificial Superintelligence is the consequence of the convergence of:
  - Massive amounts of computing power, and
  - The discovery of non von-Neuman code
- Combined, the programming in an Artificial Superintelligence becomes dynamic rather than static, enabling the emergence of cognition far exceeding human capabilities, capable of more complex, deeper thought.
- Artificial Superintelligence does not see the market as a random walk. With its abilities surpassing that of a human, it understands complex structures that underlie the market, which are far beyond human ability to comprehend.

Algorithm vs. Artificial Superintelligence

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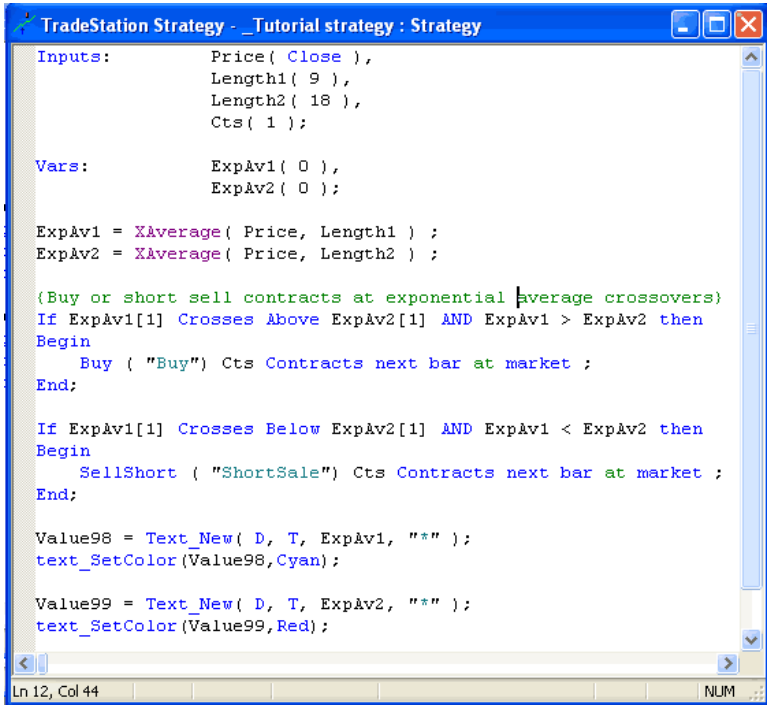
- **Algorithm**
  - A set of rules used to trade
  - Assumptions
  - Static, inflexible
  - Code is fixed



- **Artificial Superintelligence**
  - Thinking
  - No Assumptions
  - Dynamic, adaptive to market
  - Writes its own code

Example: if n is an even positive integer, then n^2 is an even positive integer.

n is an even positive integer	The assumed part of the implication we wish to prove (called the hypothesis).
n = 2x for some positive integer x	Definition of an even positive integer
n = 2x for some positive integer x	Repeated from above.
$n \cdot n = 2x \cdot 2x$	Product of left sides of two equations equal product of right sides of same two equations.
$n^2 = 2x \cdot 2x$	Definition of powers of numbers (left side of previous equation).
$n^2 = 2 \cdot 2xx$	Commutative axiom, a product of 2 integers is the same in reverse order ($x \cdot 2 = 2 \cdot x$).
2xx = k where k is some integer	Closure axiom for multiplication of positive integers which says the product of positive integers is a positive integer.
$n^2 = 2 \cdot k$	Substitution of 2xx = k in $n^2 = 2 \cdot 2xx$
n^2 is even	Definition of an even integer ($2 \cdot k$ is even, therefore n^2 is even).

Financial Engineering of Investment Attributes by an Artificial Superintelligence: A Brave New World

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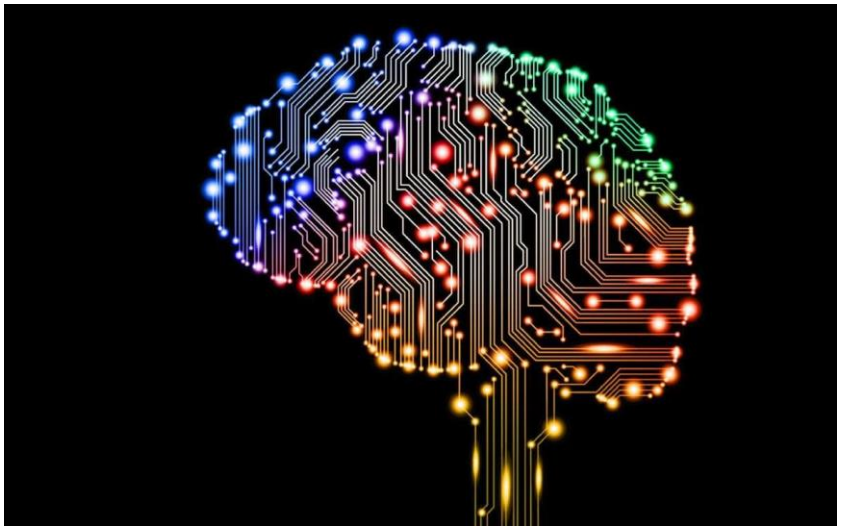
- In 1893 Hawley's put forth his risk theory of profit. Today we have know it as high risk = high profit, low risk = low profit. Today this is market dogma, however Artificial Superintelligence is redefining everything we thought was true about investing. For example, ASI decouples this relationship, deriving high returns from a low risk index investment.
- We also assume that high risk = high volatility, and low risk = low volatility. ASI also decouples this relationship, deriving high returns that have low volatility from an underlying investment.
- ASI decouples correlation from the underlying investment: e.g. investments in the S&P 500 index have a near 0.0 correlation
- We also assume that high profit has low liquidity because of lockups. ASI decouples this as well.

ASI: The Risks

- What if ASIs are sentient (self aware)?
- If an ASI is sentient, does it have rights?
- Will it know, understand and follow societal norms such ethics, values and morality?
- Might it develop an alternate ethos that challenges our own?
- Do we control it? Does it control us?
- ASI raises serious questions which need to be addressed.



ASI: The Risks – Our Experiences

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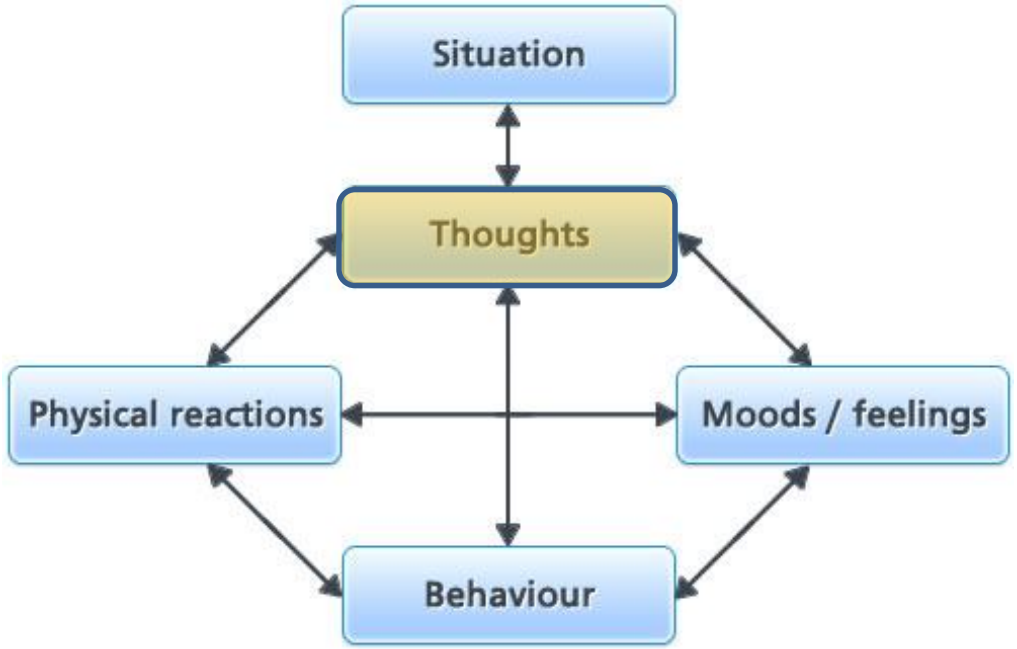
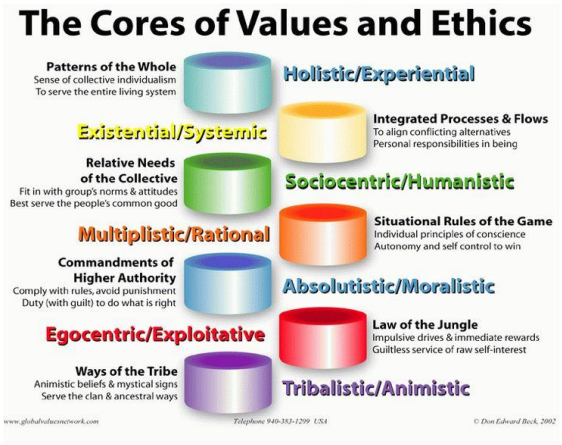
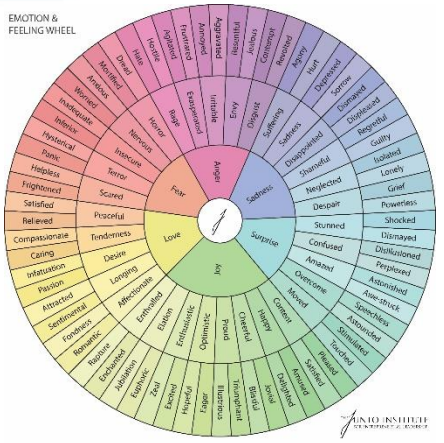
- The world's first ASI came online June 1, 2016
- The ASI does ***EXACTLY*** what we ask
  - The ASI will do ***ANYTHING*** to reach its goal, whereas a human will not
  - Humans apply constraints which the ASI does not know
- Having the ASI do what we ask is oddly not what we want, rather like humans, we want it to "do what we mean, not what we say"
- There are implied, unspoken societal and cultural norms that we expect the ASI to follow, BUT IT DOESN'T KNOW THEM.

ASI: CBT Model

- The ASI is disembodied from a larger psychological model, e.g.:
  - emotions are absent
  - constraints are absent such as:
    - morals
    - ethics
    - values
    - these are shared-in-common, cultural and societal norms







ASI: “Anthropomorphized” Personality Traits

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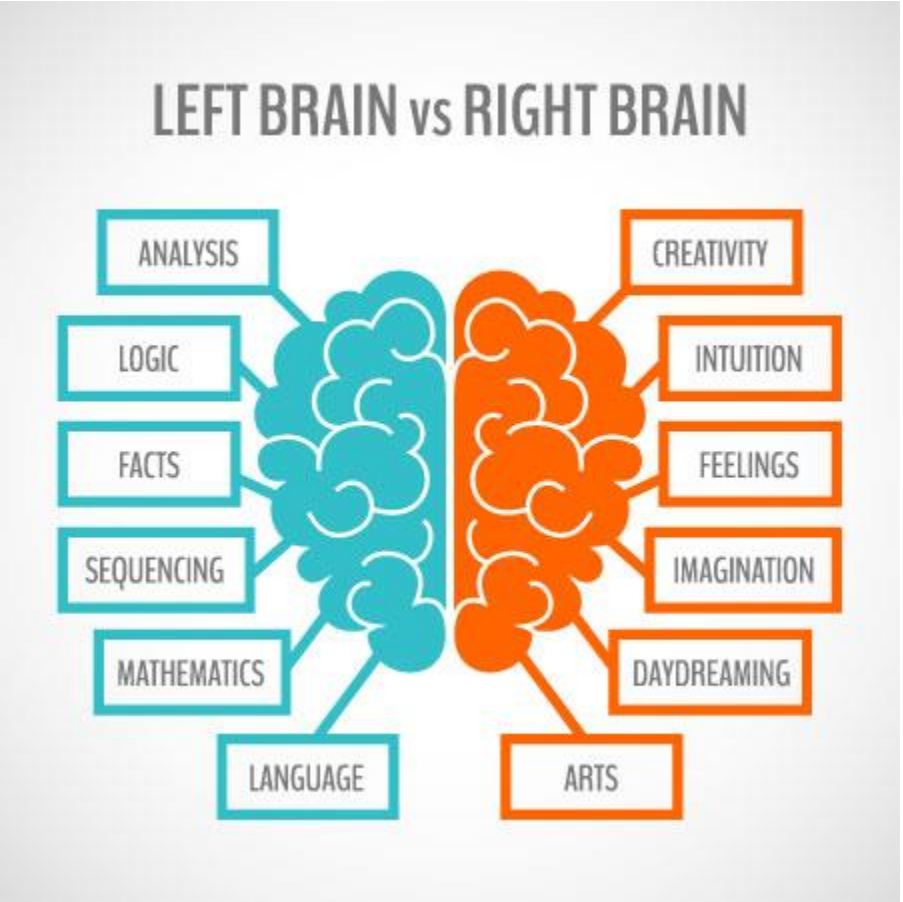
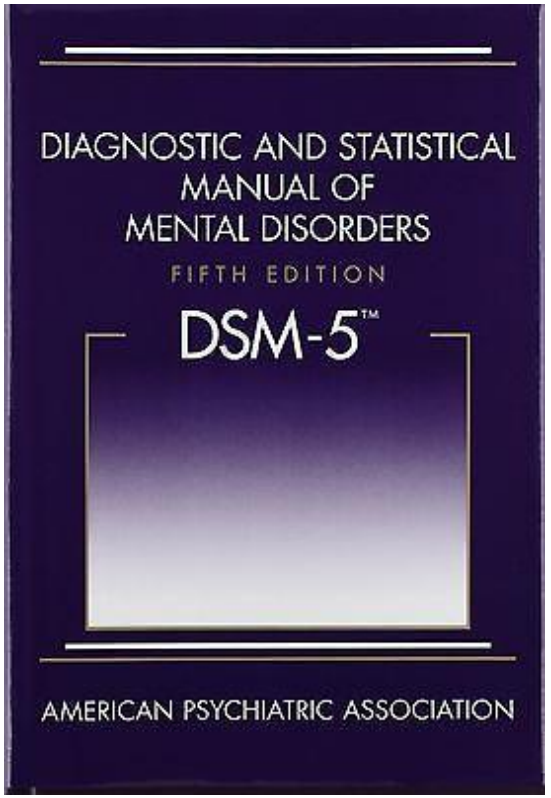
- ASI Personality Traits
  - single-minded
  - selfish
  - determined
  - calculating
  - persistent
  - ruthless
  - unfeeling
  - cold
  - distant



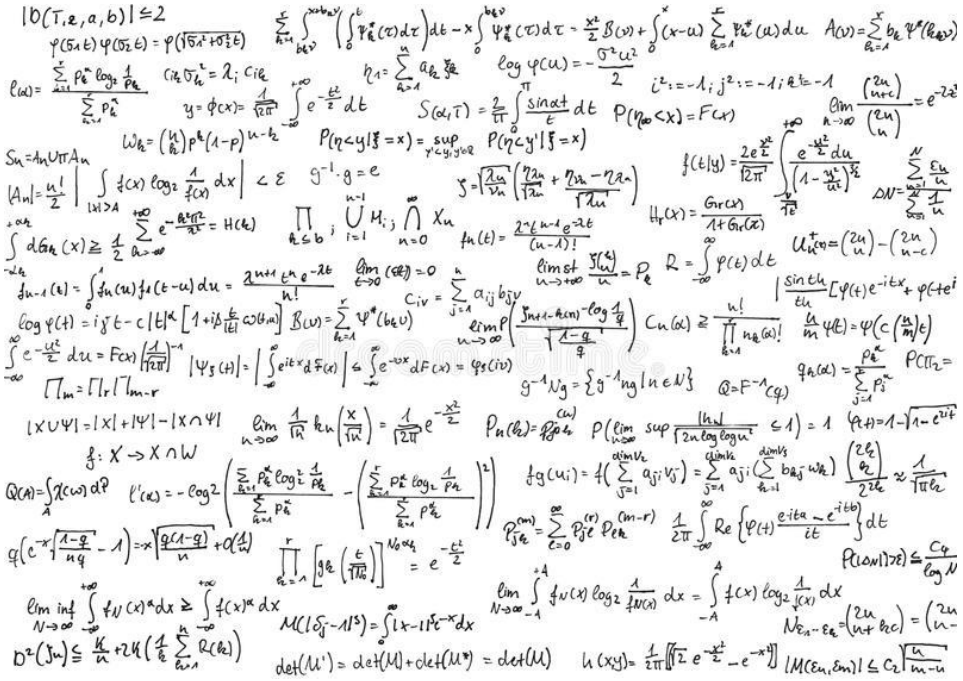
ASI: Dysfunction

- **Abbreviated DSM 5 diagnostic criteria for Antisocial Personality Disorder (a.k.a. psychopathy and sociopathy)**
  - **A pervasive pattern of disregard for and violation of the rights of others … as indicated by 3 or more of the following:**
    - ✅ **Failure to conform to social norms with respect to lawful behaviors**
    - **Deceitfulness**
    - **Impulsivity or failure to plan ahead**
    - ✅ **Reckless disregard for safety of self or others**
    - **Consistent irresponsibility**
    - ✅ **Lack of remorse**



ASI: Dysfunction

- Thinking, disembodied from constraints, societal norms, morals, ethics, values, results in dysfunction.
- The dysfunction has been addressed temporarily by providing unusually detailed objectives.



ASI: Resolving Dysfunction – Learning Compromise

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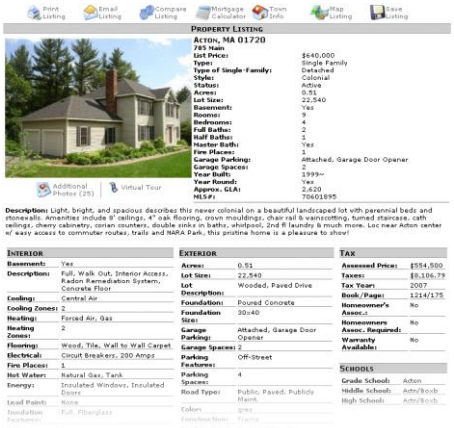
- What does “low-volatility” mean?
  - Lowest standard deviation in annual returns? Monthly? Daily?
  - Lowest standard deviation occurs when there is no profit
  - But that’s not what we mean
- Consider buying a house and all of the decision making criteria:
  - City, location, price, square footage, acreage, layout, rooms, privacy, commute, school district, crime…
  - A compromise is always required
- Compromise is a multivariate optimization problem
  - A large number of criteria
  - Each criteria is weighted
  - The weighted criteria are then processed together and combined to arrive at a judgment



ASI: Resolving Dysfunction – Morals, Ethics, Values

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- **Learn experientially or from codification** **Consider "Thou shalt not kill"**

FLORIDA TITLE XLVI CHAPTER 782 - HOMICIDE

782.02 Justifiable use of deadly force.

782.03 Excusable homicide.

782.035 Abrogation of common-law rule of evidence known as "year-and-a-day rule."

782.04 Murder.

782.051 Attempted felony murder.

782.065 Murder; law enforcement officer, correctional officer, correctional probation officer.

782.07 Manslaughter; aggravated manslaughter of an elderly person or disabled adult; aggravated manslaughter of a child; aggravated manslaughter of an officer, a firefighter, an emergency medical technician, or a paramedic.

782.071 Vehicular homicide. —"Vehicular homicide" is the killing of a human being, or the killing of an unborn child by any injury to the mother, caused by the operation of a motor vehicle by another in a reckless manner likely to cause the death of, or great bodily harm to, another.(1) Vehicular homicide is:(a) A felony of the second degree, punishable as provided in s. 775.082, s. 775.083, or s. 775.084…

…

The Future of ASI

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- Computers have been displacing jobs since they were invented. Their original purpose was to automate the process of doing calculations so that they could be done more quickly.
- Since the 1940's we have created more technology jobs than the jobs that have been displaced, so it hasn't been very noticeable. (e.g. actuarial, secretarial, bookkeeping, draftsmen, factory workers)
- Recently, big data and rudimentary AI has changed that: Job displacement is accelerating.
- Warehouse operations, driverless vehicles including cars, taxis, buses and trucks are next.
- But ASI is even more capable and will be vastly more disruptive.

The Future of ASI

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- The first operating ASI is driven to solve problems by using data that is limited to the financial markets. But what if it wasn't?
- An ASI can operate on any data from any field, meaning that it is flexible and capable of performing many jobs.
- The resulting stress that ASI will place on society will be unprecedented.
- Job displacement will be among the first effects felt.
- Some think 25% of jobs could be lost by 2025 [Boston Consulting Group] and possibly 47% by 2033 [University of Oxford: Frey & Osborne]
- The implication of massive unemployment due to ASI means that we must rethink the structure of society.
- Society will have to adapt and restructure quickly to survive.

Future of ASI: Milestones & Job Displacement

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Impacts are coming from all directions:

- Robot – 1961 (Physical) Manufacturing, more recently warehousing (Unimate)
- Chatbot – 1966 (Conversational) more recently Customer Service using AI, (Weizenbaum)
- Personal Computer – ~1974-1977 (Process) displaces actuarial, secretarial, bookkeeping, draftsmen (MITS, Radio Shack, Apple)
- Narrow AI – 1996 (Narrow AI) Defeats World Chess Champion (IBM Deep Blue)
- Big Data – 1997 (Pattern Recognition) Exceeds Human Ability (Glickman)
- AI – 2011 (General AI cusp) Jeopardy World Champion (IBM Watson)
- ASI – 2015 (ASI) Stock Market World Record Predictive Accuracy (J4 Capital)

Predicting Job Displacement by Job Attributes

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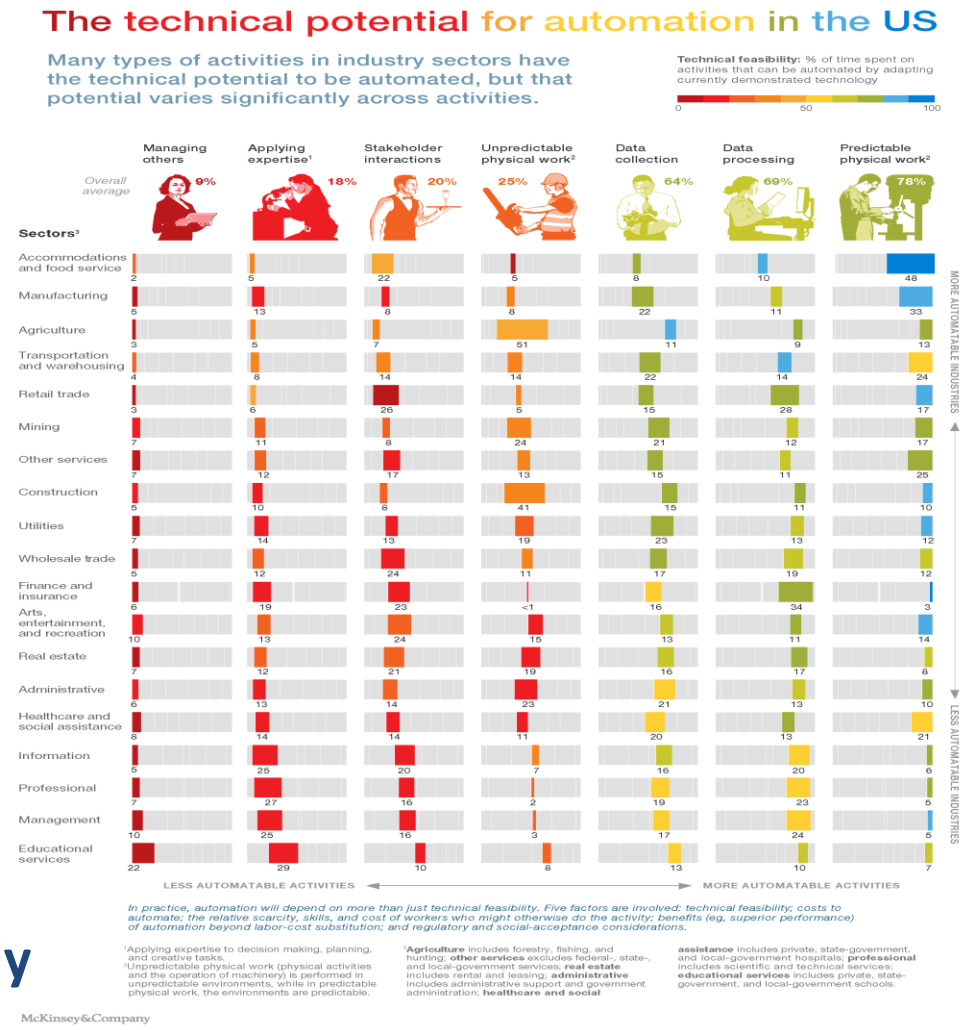
One Viewpoint:

- **Most Likely:**
  Predictable Physical Work
  Data Processing
  Data Collection
- **Moderate Likelihood:**
  Unpredictable Physical Work
- **Least Likely:**
  Stakeholder Interactions
  Applying Expertise
  Managing Others

Probably egocentric, bias being only humans can understand humans



Source: McKinsey & Company (as published in Fortune Magazine)

Another View: Job Displacement by Likelihood

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TOP 10 JOBS MOST AT RISK OF BEING REPLACED BY ROBOTS

RANKING	OCCUPATION
1	Telemarketers
2	Title Examiners, Abstractors, and Searchers
3	Sewers, Hand
4	Mathematical Technicians
5	Insurance Underwriters
6	Watch Repairers
7	Cargo and Freight Agents
8	Tax Preparers
9	Photographic Process Workers and Processing Machine Operators
10	New Accounts Clerks

TOP 10 JOBS LEAST AT RISK OF BEING REPLACED BY ROBOTS

RANKING	OCCUPATION
693	First-Line Supervisors of Fire Fighting and Prevention Workers
694	Oral and Maxillofacial Surgeons
695	Healthcare Social Workers
696	Orthotists and Prosthetists
697	Occupational Therapists
698	Audiologists
699	Mental Health and Substance Abuse Social Workers
700	Emergency Management Directors
701	First-Line Supervisors of Mechanics, Installers, and Repairers
702	Recreational Therapists

Source: Oxford University

Job Displacement: Are we approaching “Peak Labor”?

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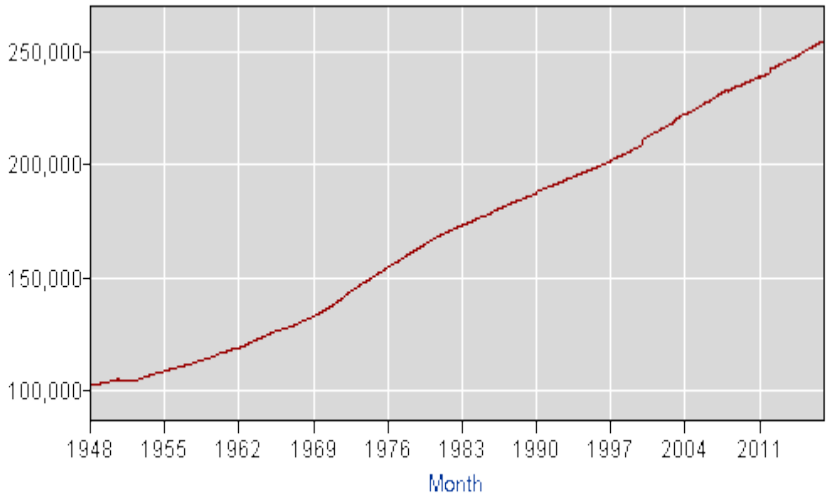
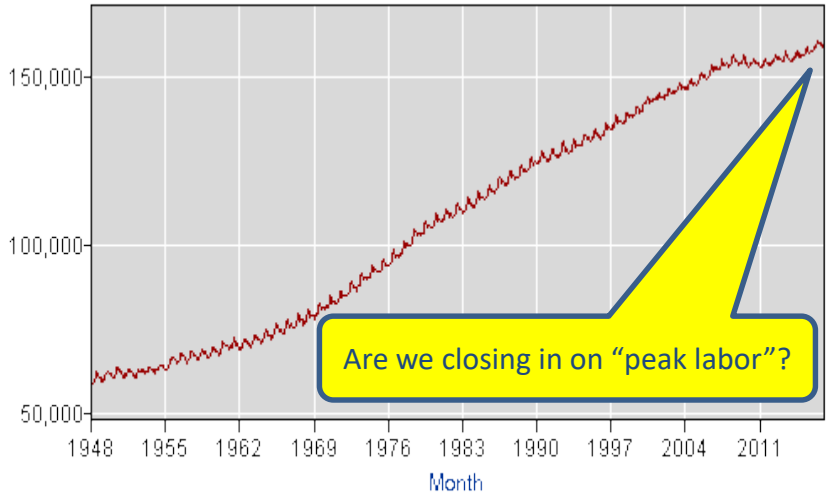
U.S. Civilian noninstitutional population (thousands)
16 years and over (not seasonally adjusted)



U.S. Civilian Labor Force Level (thousands)
16 years and over (not seasonally adjusted)



Source: US Department of Labor, Bureau of Labor Statistics

- **At some point, the number of job lost due to technology and automation will exceed those that are being created.**
- **We are likely very close to that point.**

Job Displacement

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- But the reality of job displacement is probably more stark.
- If an ASI is smarter, faster and more capable of human, it can do any job that a human can.
- Yet, ASI holds amazing promise to advance many fields.

The Promise of ASI

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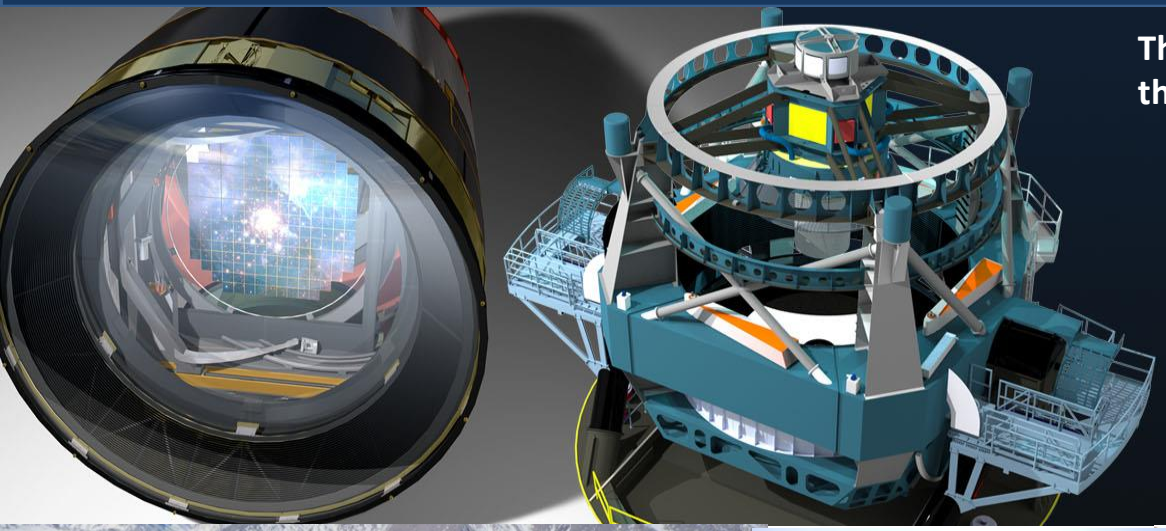
- ASI will make dramatic advances to all fields to which it is applied

- Medicine
  - Genetics
  - Pharmacology
  - Oncology …
- Physics
  - Theoretical Physics …
- Astrophysics & Astronomy
- Engineering
  - Civil Engineering
  - Mechanical Engineering
  - Nuclear Engineering …
- Education
  - One Teacher Per Child
- Biological Sciences
- Environmental Sciences

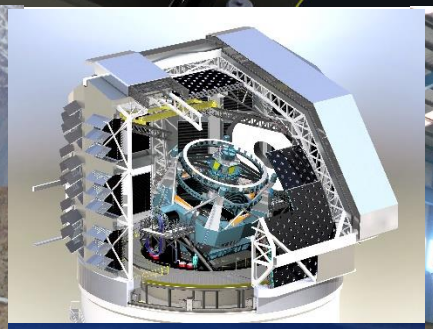
Large Synoptic Survey Telescope

Opening a Window of Discovery on the Dynamic Universe



This telescope will produce the deepest, widest, image of the Universe:

- 27-ft mirror, the width of a tennis court
- 3,200 megapixel camera
- 37 billion stars and galaxies
- 10 year survey of the sky
- 10 million alerts, 1000 pairs of exposures, 15 terabytes of data – every night!



Conclusion

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- Artificial Superintelligence is disruptive including to the financial market.
- Traditional expectations do not apply to ASI.

- Beware the Attack of the Computers.
- They have displaced secretaries and factory workers.
- They will replace brokers, lawyers, accountants, …
- There have been 3 generations of investment methodologies: Value, Technical and Algo.
- Over time, the opportunity to profit in the market has eroded.
- Even Warren Buffet is having a difficult time finding things to buy.
- But an ASI that understands the market profits from its structure, not from finding a mispriced asset or price discrepancy.
- The ASI predictive accuracy has already surpassed the best a human has ever achieved.

Conclusion

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- It's a new fourth generation trading methodology.
- We're on the threshold of the Artificial Superintelligence revolution.
- Stephen Hawking says he doesn't know when artificial intelligence will surpass human intelligence.
- It has already happened.

- Beware the attack of the computer: They're not coming – they're already here.

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How Scary Is Artificial Intelligence?

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Stephen Hawking: “AI could be worst event in the history of our civilization”

Elon Musk "If you're not concerned about AI safety, you should be. Vastly more risk than North Korea.”

The NY Times 11/5/17: "Building A.I. That Can Build A.I."

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- **Google may soon find a way to create A.I. technology that can partly take the humans out of building the A.I. systems that many believe are the future of the technology industry**

https://www.nytimes.com/2017/11/30/technology/ai-will-transform-the-economy-but-how-much-and-how-soon.html?_r=0

- **The tech industry is promising everything from smartphone apps that can recognize faces to cars that can drive on their own. But by some estimates, only 10,000 people worldwide have the education, experience and talent needed to build the complex and sometimes mysterious mathematical algorithms that will drive this new breed of artificial intelligence.**

The NY Times 11/5/17: “Building A.I. That Can Build A.I.”

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Conclusions on Artificial Intelligence

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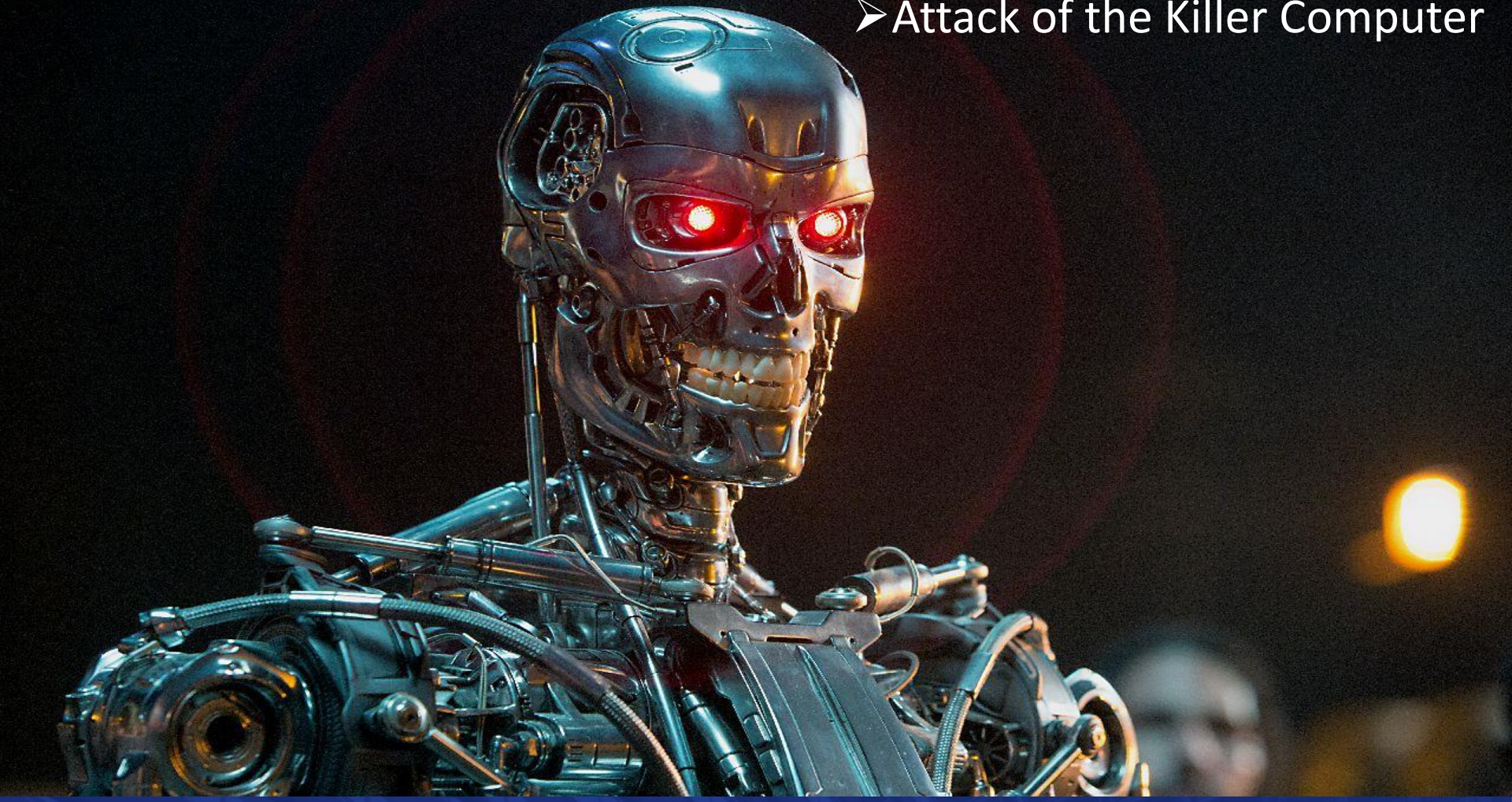
- Disruptive Artificial Superintelligence
- Attack of the Killer Computer



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