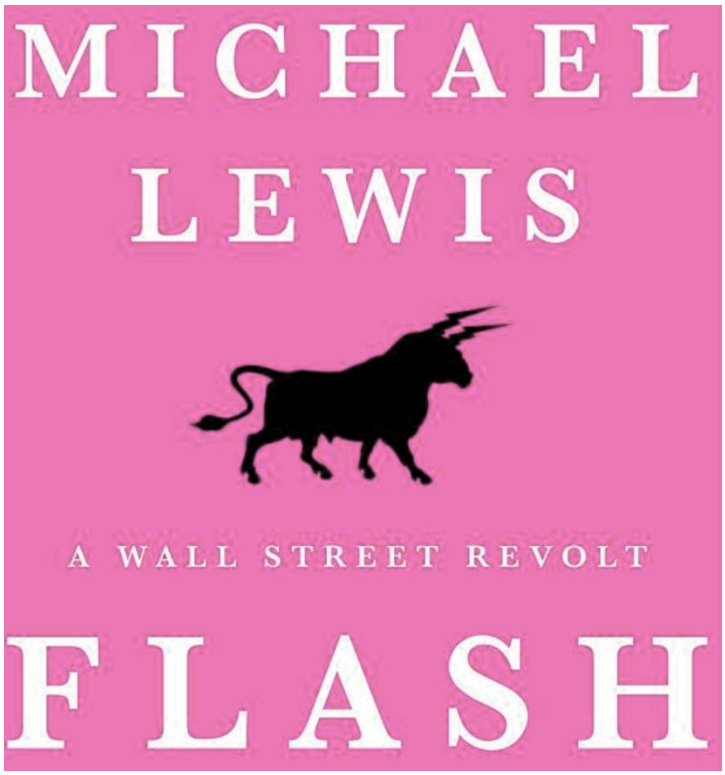
Technology / Engineering Ethics

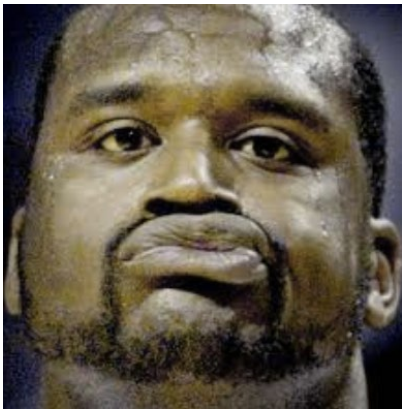
Laboratory 2- Options A

Title: The Law and Ethics of High-Frequency Trading

Based on the Book….



Using Technology for the Public Good….?



Description: In this Case Study (Option-A) Laboratory 2, we will explore how Fiber Optic Technology was used (or rather misused) not to bring the much needed Broad Band Connectivity to those in dire need of high speed internet in Urban and Rural communities, but rather to create a secret High Speed Network in the Financial Trading market , giving a sinister advantage to what is known as High Frequency Traders which lead to the eventual Wall Street Meltdown 2010 (google to read more). Due mainly to the publication of Michael Lewis, *FlashBoys*, the American public is once again concerned with the question of the fairness of the financial marketplace. Lewis specific charge is that the stock market is a rigged game, with high-frequency traders preying upon more traditional Main Street investors and the institutional investors.

NOTICE→ Learn more about HFT at https://www.youtube.com/watch?v=qGn_RgnRE5w

Case Background:

Imagine if your ability to feed your family depended upon how fast you could run. Imagine the aisles of your grocery store as lanes on a running track. If you can outrun your fellow shoppers, grab food off the shelves and race through the checkout at the finish line, then your family gets to eat. If not, then your family starves.

We will look at the ethical problems in the multi-billion dollar world of high-frequency trading, which is responsible for almost 99% of trades on the U.S. stock market. High frequency trading works like this: people with access to high-speed, fiber optic cables with advanced algorithms can use them to buy and sell shares in **milliseconds.** Those cables, however, cost millions of dollars per year, meaning only the wealthy elite can afford to use them.
In more understandable terms we will study how the colossal profits of high-frequency traders really amount to a perverted abuse of the ordinary investor, or other financial institutions on which general public livelihoods depend.

Definition: HFT is best defined as computer-assisted trading that exploits incredibly small time differences to yield profits at minimal risk to those employing it.The programs can then predict the direction of trades, the likely price and buy the stock at lower prices. The shares are then sold at the higher price – all in a fraction of a blink of an eye. By the way, this aspect of trading is completely and perfectly legal. **So where does it get nasty?**

The "FlashBoys" of Michael Lewis' book refers to another aspect of trading in which **certain market participants** are allowed to see incoming orders to buy or sell securities at very slightly earlier times **than the general market participants**, typically 0.1 – 30 milliseconds, in exchange for a fee. This is flagrant abuse of ethics and comparable to someone telling you at the supermarket analogy above, which lanes are open, which cashiers are slow, prior to you entering the store! It

was this revelation that caused an uproar to normal investors- basically allowing one to cheat illegally on the market for a fee!

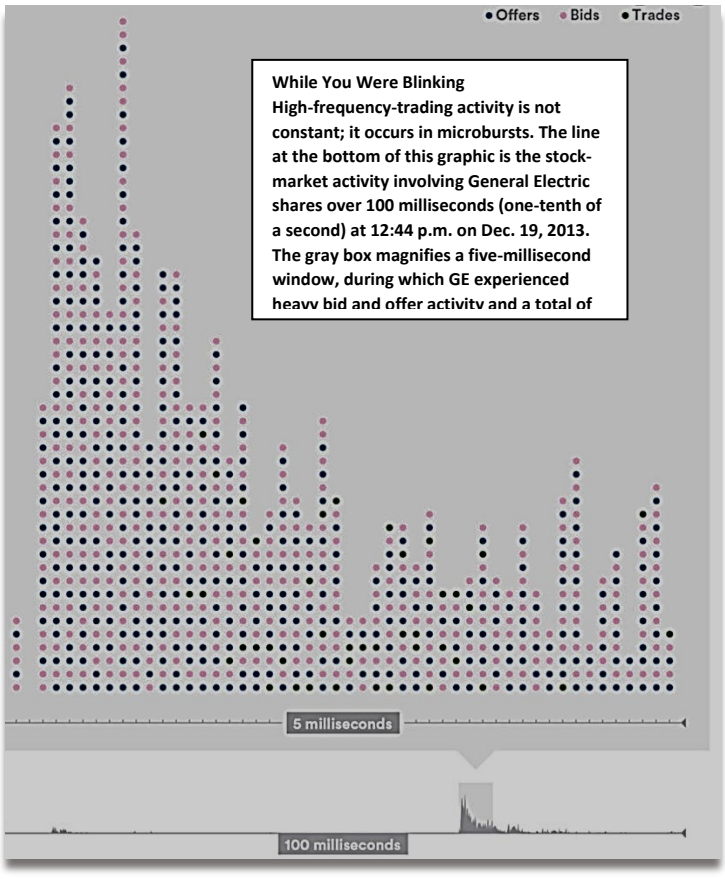
As one expert mentioned [1] a millisecond is, "an eternity when your system is able to make a decision in microseconds to nanoseconds ". That's about 100 to 50,000 times faster than others have access to the same information.

So in the book, *Flash Boys* – that high-frequency traders have "rigged" the stock market, profiting from speeds unavailable to others and getting a first look at trades from other large investors, brokers and hedge funds. So, the debate really is about speed – a race that is played out at speeds faster than humans can think, never mind act upon.

How? What If I told told you that these 3 individuals below, labelled as the TEAM, built a fiber optical from Chicago to NY / NJ paying huge amount of money to keep the cable as straight as possible on its route to NY / NJ, by tunneling through mountains, digging up highways, and paying City officials for rights of way to lay fiber optic cable along routes prohibited to all, to shave off milliseconds from the speed of light on the optical fiber?

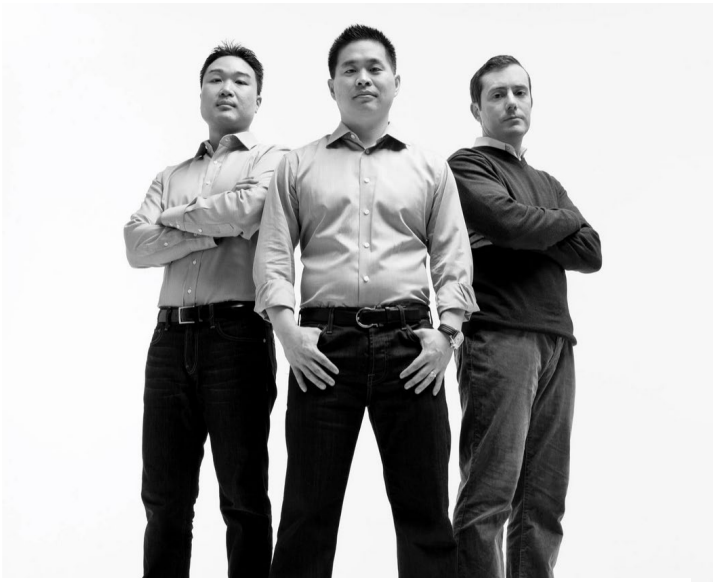
For example, every extra foot of fiber-optic cable adds about 1.5 nanoseconds of delay; each additional mile adds 8 microseconds. This was a Private fiber optical cable systems worth about $400M which is peanuts considering the return on the investment in profits.Without going into the complexity of all the other components, please take a look at the following chart:

Task # 1: In groups of 4, Explain how to read this chart to see the massive advantage the unethical HFT groups had over the regular the regular market, using the scale of the x axis if the total x scale is 5 millisecond wide and the bottom scale is 100 millisecond wide.



Meet the Team – Very Famous, Brilliant Engineers / Financial Engineers (Quants)

From left: Rob Park, Brad Katsuyama and Ronan Ryan. **Credit...Stefan Ruiz for The New York Times**



Watch the interview with Brad:
https://www.youtube.com/watch?v=qGn_RgnRE5w

https://www.youtube.com/watch?v=HKGuu5piwi8

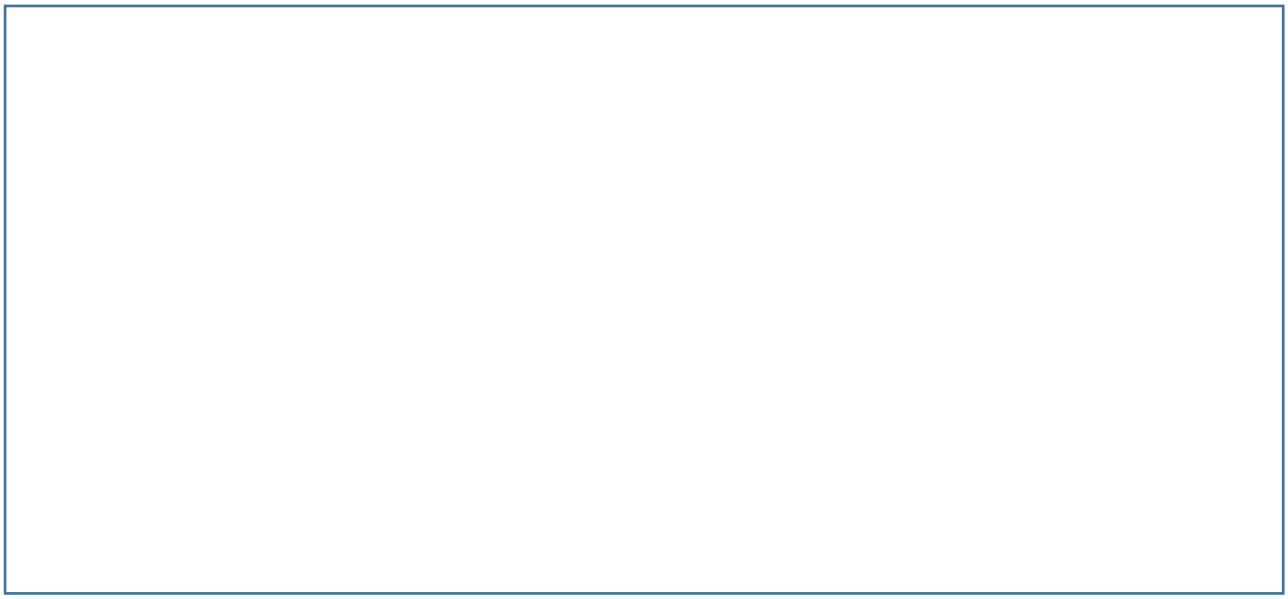
Lab Procedure Exercise

Case: Discuss this exercise in groups of four students. The instructor will visit you t help you in formulating your opinions to answer the questions below.

Imagine that you were a high frequency computer programmer. You love many aspects of your job: your firm provides you with state-of-the-art computer. You consider it an exhilarating challenge to write programs which buy and sell stocks much faster than the blink of an eye. And your salary is excellent ($390,000) good enough to allow you and your family a comfortable standard of living.

1. As ethical guidelines you are provided with trading regulations, with which your programs must comply and the firm's code of conduct, stating that you should always serve the best *interests of your clients*; and the promise of your boss and high frequency trading lobby groups, that you provide liquidity –the ability to sell a stock immediately and receive your winning immediately.

   Would that be enough for you to feel morally satisfied? Or would you question the ethicality of the regulations, the scope of your Public Social contribution and the emotional value of you thinking that you are of providing the market with liquidity, meaning your have the advantages of selling or buy a stock at little of no change to the value of the stock----in other words, you are providing a good service to society. Supposedly.



2. Which criteria would you choose to judge the ethicality of your HFT profession? Place your answer in the box below:

   Hint: Look at the criteria for conflict decision making in Lecture Slides 2. Consider that all business decisions have an ethical or moral dimension because they have an effect on stakeholders.

   Ethical decisions cannot be made solely through objective analysis or consideration of data and information, but must rely on judgment and interpretation.

   Making ethical decisions also involves choice about who should be involved in the process and how the decision should be made.

   To give you a better feel, listen to what is sounds like to work for a HFT:

   > "If you try to plug any kind of USB device , generally speaking, it would be automatically deactivated . Everything that you printing is recorded, every email that you send is recorded, obviously, every conversation that you are having on the phone is recorded and when you send an email externally, before it goes out the door; it gets through, I think, six or seven different checks .
   > It is crazy, I know"