Scott Patterson: "Dark Pools: The Rise of A.I. Trading Machines and the Looming Threat to Wall Street", Random House Business Books, 2013.

The book of the ultra-fast trading of stock [1] was introduced in this previous column that it is the most distant presence in satellite communications [2]. After that, there is a book review that stock trading has a greater impact than the high-speed communication lines due to activity of Artificial Intelligence (AI) in this field [3]. Although I would like to treat the book, I am interested in the problem of AI itself and took out and introduced the most appropriate book [4][5]. Now, it is the time to introduce this book that treats the stock trading using AI. However, since I have almost no knowledge about stock trading, I can not understand the description in detail, so I was bored a little to read this book, frankly speaking. However, I became interesting suddenly this book and I could read it through although diagonal reading, when I noticed that the stock trading is the most appropriate opportunities to develop the AI by thinking as follows: There are many areas that activity of the AI is desired, such as automatic operation of a motor vehicle and drone control. Company like Google is cited when it comes to AI development [6]. But actually, it might be a suitable point of view that the most advanced site of the AI leverages is the stock trading market. The AI is not only the most necessary for the stock trading, but also its development is accelerated by prominent researchers and programmers, because each other is carried out close competition to the law of the jungle and huge amount of investment is conducted from the size of the benefit. Because I will describe the following within my scope of understanding, there may be some misunderstanding. Please forgive me in such a case. The most of this review are based on Japanese translation version of this book.

The author of this book, Scott Paterson, is an American financial journalist of The Wall Street Journal. Although his other profile is unidentified, he might become a bestselling author by this book.

This book treats the development of computer stock trading from 1970s to 2011, that is longer range than "Flash Boys" [1] of high speed trading. Stock trading was done by hand signal of a trader in the trading floor, but the introduction of the computer to respond smoothly to customer orders began in that it has been recommended by the government. Once a computer is introduced, the program plays an important role in how the transaction is carried out smoothly. Consequently, genius programmers began their activities and venture entrepreneurs have emerged to provide a place where the genius programmers are active. In particular, how quickly a trader taps the keyboard is competed for stock trading. He works to continue typing all day sitting from his arrival to work in the morning. The customer's order can not be met smoothly in such a state, then inequality occurs. Therefore, this book describes about Josh Levin, one of genius programmers, who aims at eliminating such problems. He is listed under the banner of the "Information wants to be free", aiming to change the world through the computer. His concept has transformed the US stock market, and developed the program of the computer stock trading system, "Watcher" and "Monster key" that becomes a prototype of the trading algorithm. In addition, he founded the electronic trading networks "Island", this book describes that he pours energy into the system making. This book has drawn fierce business environment including such excellent venture companies with the program and their rise, fall, merger and selling. Such as harsh environment might raise an excellent system like that Renaissance has been rise in the era of turmoil and upheaval [7].

Although a term of AI is coming out everywhere in this book, its contents are not mentioned in detail, also the term of deep learning does not come out. Given the evolution of AI research, the AI research had the second time of boom in the era from 1980 to 1990s, but its research did not go well in the late 1990s and the boom became sluggish. Subsequently the technique of deep learning has been studied in the 2000s and the boom is coming again. AI has become a chance to be noted [8]. Using the AI trying to predict the outcome of the market in stock trading was proposed in 1997. Using AI has been described by citing the deep blue of the developed chess software in the late 1990s. This period corresponds to the end of the second boom of AI research. Then, big data becomes a thing that can not be handled only by a computer. Using AI has been in full swing with the advent of the third boom of AI research. The AI program "STAR" is introduced as an example: it selects the stock by taking the big data including commodity prices of crude oil and corn, the international monetary performance and the latest price movements of stock prices around the world, and it studies strategy of its own stock selection. STAR raised the achievements in stock trading immediately after the collapse of Lehman Brothers in 2008.

Nikkei Book Review [3] commented that the computer algorithm has larger degree of importance than the

high-speed communication line in stock trading. However, it does not in any way mean that the importance of the communication line speed has dropped. This book describes a large problem of high speed trading and the optical fiber facilities between New York and Chicago which is described in the book "Flash Boys" [1], in addition, microwave link to transmit trading signals at rates that dwarfed those boasted by fiber. Since the high speed transaction includes high frequency one necessarily, it must be noted that the communication capacity will become huge.

Although the profile of many concerned persons is depicted in the book, the persons' name other than the current Vice President Biden of his young age is my unfamiliar one. Among such people, Ed Nicoll is introduced. He was employed as an expert banker and Chief Operating Officer (COO) by Datek Online in early 1999. He was active to show his company's image well. He is a believer of the free-market philosophy of the novelist Ayn Rand along with Allan Greenspan, Federal Reserve chairman, and many other financiers on Wall Street. As I mentioned in the previous column [9], Ayn Rand published her philosophy novel "Atlas Shrugged" in 1957 [10], and she is still popular in U.S., and tends to be referred for Republican progress pro-tea party of mid-term election of 2010 by the host of conservative radio show, and there are still many enthusiastic fans.

In addition, although the development of AI might be also essential in military technology and might advanced considerably, the side of competition seems to be weaker than the stock trading, because the scene that actual utilization might be only in a war. The most of military technology might be classified, excellent algorithms in stock trading is also to be a private. So military technology seems to be comparable in this regard. Although there are the policies that AI and robot are used to grow in Japan [11], by eliminating the regulations in place such as stock trading [12] to create an environment to grow up a free venture must be a top priority. The development of the use of AI and AI itself for stock trading is believed to continue being carried out more and more in the future [13] [14].

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