Research & Development Start-up

First Artificial Intellect Based

Transuter

Pali Nazir, M.D., Ph.D.

Rama Nazir, M.Sc.

... בְּצַלְמֵנוּ כִּדְמוּתֵנוּ ...

... in our image, after our likeness ... (Genesis 1, 26)

All over its history, mankind in its struggle for survival has been obliged to improve itself in every fields of life. In some of them quality was sought, in others performances. Then appeared new fields of researches branching out from previous ones. For example, after bartering in order to facilitate trade and taxes, calculation emerged which was later refined to arithmetic algebra and geometry, etc...

Calculus, primarily executed by counting on fingers and followed by abacuses only constrained to additions and subtractions imitating two hands of five fingers and a number of rows for the digits, was further improved to multiplications and divisions with Napier's Bones by the same inventor of logarithms John Napier and applied to the slide rule used till the last sixties and seventies before the advent of the pocket calculator.

The first gear-driven calculating machine to actually be built was probably the calculating clock, so named by its inventor, the German professor Wilhelm Schickard in 1623. In 1642 Blaise Pascal, at age 19, invented the "Pascaline", gear-driven and as the previous one was a one-function calculator.

Just a few years after, Gottfried Wilhelm Leibniz (co-inventor with Newton of calculus) managed to build a four-functions (addition, subtraction, multiplication, and division) calculator that he called "stepped reckoner" because, instead of gears, it employed fluted drums having ten flutes arranged around their circumference in a stair-step fashion. Although the "stepped reckoner" employed the decimal number system (each drum had 10 flutes), Leibniz was the first to advocate use of the binary number system which is fundamental to the operation of modern computers.

It should be noted that in 1801 the French Joseph Marie Jacquard invented a power loom that could base its weave (and hence the design on the fabric) upon a pattern automatically read from punched wooden cards, held together in a long row by rope. Descendents of these punched cards have been in use ever since (famous IBM punched cards and "hanging chad" from the Florida presidential ballots of the year 2000).

By 1822 the English mathematician Charles Babbage was proposing a steam driven calculating machine the size of a room, which he called the "Difference Engine". This machine would be able to compute tables of numbers, such as logarithm tables. Ten years later the device was still nowhere near complete. Babbage was not deterred, and by then was on to his next brainstorm, which he called the "Analytic Engine". This device would be more general purpose in nature because it would be programmable, thanks to the punched card technology of Jacquard. But Babbage made the important intellectual leap regarding the punched cards. Babbage saw that there was no requirement that the problem matter itself physically pass through the holes. Furthermore, Babbage realized that punched paper could be employed as a storage mechanism, holding computed numbers for future reference. *Because of the connection to the Jacquard loom, Babbage called the two main parts of his "Analytic Engine" the "Store" and the "Mill", as both terms are used in the weaving industry. The Store was where numbers were held and the Mill was where they were "woven" into new results. In a modern computer these same parts are called the memory unit and the central processing unit (CPU).* The Analytic Engine also had a key function that distinguishes "computers" from calculators: the conditional statement allowing a program to achieve different results each time it is run. Based on the conditional statement, the path of the program (that is, what statements are executed next) can be determined based upon a condition or situation that is detected at the very moment the program is running.

Babbage befriended Ada Byron, the daughter of the famous poet Lord Byron (who later become the Countess Lady Lovelace by marriage). Though she was only 19, she was fascinated

by Babbage's ideas and thru letters and meetings with Babbage she learned enough about the design of the Analytic Engine to begin fashioning programs for the still not built machine. While Babbage refused to publish his knowledge for another 30 years, Ada wrote a series of "Notes" wherein she detailed sequences of instructions she had prepared for the Analytic Engine. The Analytic Engine remained not built (the British government refused to get involved with this project) but Ada earned her spot in history as the first computer programmer. Ada invented the "subroutine" and was the first to recognize the importance of "looping".
The next breakthrough occurred in America. The U.S. Constitution states that a census should be taken of all U.S. citizens every 10 years in order to determine the representation of the states in Congress but as the U.S. population had grown so much that the count for the 1880 census took 7.5 years, automation was clearly needed for the next census. The census bureau offered a prize won by Herman Hollerith, who proposed and then successfully adopted Jacquard's punched cards for the purpose of computation in his "Hollerith desk", consisting of a card reader which sensed the holes in the cards, a gear driven mechanism which could count, and a large wall of dial indicators to display the results of the count. Hollerith built a company, the Tabulating Machine Company which, after a few buyouts, eventually became International Business Machines, known today as IBM. IBM grew rapidly and punched cards became ubiquitous.
Jointly with the use of the slide rule also named colloquially in the United States as "slipstick", from the last thirties, research for improvements really began and at Bell Laboratories, George Stibitz by using relays demonstrated that circuit provides proof of concept for applying Boolean logic to the design of "computers", resulting in construction of the relay-based Model I Complex Calculator in 1939. That same year in Germany, engineer Konrad Zuse built a Z2 computer, also using telephone company relays. Zuse also invented what might be the first high-level computer language, "Plankalkul", though it too was unknown outside Germany. But their architecture is identical to that still in use today: an arithmetic unit to do the calculations, a memory for storing numbers, a control system to supervise operations, and input and output devices to connect to the external world.
IBM continued to develop mechanical calculators for sale to businesses to help with financial accounting and inventory accounting. One characteristic of both accountings is that although you need to subtract, you don't need negative numbers and you also don't have to multiply since multiplication can be accomplished via repeated addition. But the U.S. military desired a mechanical calculator more optimized for scientific computation.
By World War II the U.S. Navy needed to lob shells over distances up to 25 miles, physicists could write the equations that described how atmospheric drag, wind, gravity, muzzle velocity, etc. would determine the trajectory of the shell. But solving such equations was extremely laborious. This was the work performed by the human computers and their results would be published in ballistic "firing tables" published in gunnery manuals. The U.S. military scoured the country looking for (generally female) math majors to hire for the job of computing these tables but not enough humans could be found to keep up with the need for new tables.
One early success was the Harvard Mark I computer which was built as a partnership between Harvard and IBM in 1944. This was the first programmable digital computer made in the U.S. But it was not a purely electronic computer. Instead the Mark I was constructed out of switches, relays, rotating shafts, and clutches. The machine weighed 5 tons, incorporated 500 miles of wire, was 8 feet tall and 51 feet long, and had a 50 ft rotating shaft running its length, turned by a 5 horsepower electric motor. The Mark I ran non-stop for 15 years, sounding like a roomful of ladies knitting.
One of the primary programmers for the Mark I was a woman, Grace Hopper. Hopper found the first computer "bug": a dead moth that had gotten into the Mark I and whose wings were blocking the reading of the holes in the paper tape. The word "bug" had been used to describe a

defect since at least 1889 but Hopper is credited with coining the word "debugging" to describe the work to eliminate program faults.

In 1953 Grace Hopper invented the first high-level language, "Flow-matic". This language eventually became COBOL which was the language most affected by the infamous Y2K problem also named "millennium bug". A high-level language is designed to be more understandable by humans than is the binary language understood by the computing machinery. A high-level language is worthless without a program - known as a compiler - to translate it into the binary language of the computer and hence Grace Hopper also constructed the world's first compiler.

Comparison between the Mark I and a today home computer is about 30.000.000 for the last one in the different fields of speed execution, storage and speed of retrieving this storage. This kind of speed is obviously impossible for a machine which must move a rotating shaft and that is why electronic computers killed off their mechanical predecessors.

In the field of computation, the noun "Computer" was originally used to describe human beings whose job was to perform the repetitive calculations required to compute such things as navigational tables, tide charts, and planetary positions for astronomical almanacs, after this, "Computer" was assigned even retroactively to mechanical computers, and further to electronic computers. We will call those electronic computers from now on "computers".

The title of forefather of today's all-electronic digital computers is usually awarded to ENIAC, which stood for Electronic Numerical Integrator and Calculator. ENIAC was built at the University of Pennsylvania between 1943 and 1945 by two professors, John Mauchly and the 24 year old J. Presper Eckert, who got funding from the war department after promising they could build a machine that would replace all the "computers", meaning the women who were employed calculating the firing tables for the army's artillery guns.

ENIAC filled a 20 by 40 foot room, weighed 30 tons, and used more than 18,000 vacuum tubes. Like the Mark I, ENIAC employed paper card readers obtained from IBM.

Once ENIAC was finished and proved worthy of the cost of its development, its designers set about to eliminate the obnoxious fact that reprogramming the computer required a physical modification of all the patch cords and switches. It took days to change ENIAC's program. Eckert and Mauchly's next teamed up with the mathematician John von Neumann to design EDVAC, which pioneered the stored program. After ENIAC and EDVAC came other computers with humorous names such as ILLIAC, JOHNNIAC, and, of course, MANIAC. Von Neumann is perhaps most famous and infamous as the man who worked out the complicated method needed to detonate an atomic bomb.

Once the computer's program was represented electronically, modifications to that program could happen as fast as the computer could compute. In fact, computer programs called self-modifying programs could now modify themselves while they ran. This introduced a new way for a program to fail: faulty logic in the program could cause it to damage itself. This is one source of the general protection fault famous in MS-DOS and the blue screen of death famous in Windows.

By the end of the 1950's computers were no longer one-of-a-kind hand built devices owned only by universities and government research labs. Eckert and Mauchly left the University of Pennsylvania over a dispute about who owned the patents for their invention. They decided to set up their own company. Their first product was the famous UNIVAC computer, the first commercial (that is, mass produced) computer. In the 50's, UNIVAC (a contraction of "Universal Automatic Computer") was the household word for "computer" just as "Kleenex" is for "tissue". The first UNIVAC was sold, appropriately enough, to the Census bureau. UNIVAC was also the first computer to employ magnetic tape and till now many people still confuse a picture of a reel-to-reel tape recorder with a picture of a mainframe computer.

ENIAC was unquestionably the origin of the U.S. commercial computer industry, but its inventors, Mauchly and Eckert, never achieved fortune from their work. By 1955 IBM was selling more computers than UNIVAC and by the 1960's the group of eight companies selling computers was known as "IBM and the seven dwarfs". IBM grew so dominant that the federal government pursued anti-trust proceedings against them from 1969 to 1982. In IBM's case it was their own decision to hire an unknown but aggressive firm called Microsoft to provide the software for their personal computer (PC). This lucrative contract allowed Microsoft to grow so dominant that by the year 2000 their market capitalization (the total value of their stock) was twice that of IBM and they were convicted in Federal Court of running an illegal monopoly.

If you learned computer programming in the 1970's, you dealt with what today are called mainframe computers, such as the IBM 7090, IBM 360 or IBM 370.

There were 2 ways to interact with a mainframe. The first was called time sharing because the computer gave each user a tiny sliver of time in a round-robin fashion. The alternative to time sharing was batch mode processing, where the computer gives its full attention to your program. In exchange for getting the computer's full attention at run-time, you had to agree to prepare your program off-line on a key punch machine which generated punched cards.

But things changed fast. By the 1990's a university student would typically own his own computer and have exclusive use of it in his dorm room. This transformation was a result of the invention of the microprocessor. A microprocessor (µP or uP) is a computer that is fabricated on an integrated circuit (IC). Computers had been around for 20 years before the first microprocessor was developed at Intel in 1971.

The history of computing is so complex that when we ask who made the first PC, the answer is unclear. Most of us think of Steve Jobs and Steve Wozniak in 1976 building their Apple I in a garage and showing the world the "world's first personal computer". Some experts believe that the first PC was the Altair 8800, born in 1975. Others believe that the first one was the Kenbak-1, created in 1971. Although we don't have much information of what has been made beyond the "Iron Curtain", but in fact, history may surprise us.

The first personal computer was created in the Russian city of Omsk by engineer Arseny Gorokhov and called "Intellektor". His original design included screen, processor unit with a separate hard drive, motherboard, memory, video card and even a sort of mouse to interact with the computer. This design was not built, although it was patented in 1968, almost eight years before the first Apple I went on sale, and sold as a do-it-yourself kit.

The microelectronics revolution is what allowed the amount of hand-crafted wiring confined in a mainframe computer to be mass-produced as an integrated circuit which is a small sliver of silicon the size of your thumbnail .

This brief historical survey was necessary to show the drastic exponential acceleration of improvements in the computing world and the fact that those improvements as in other fields in life, were possible because of personal initiatives, strong motivation, basic knowledge on previous fundamental researches and most of the time a team commitment to achieve the goal they set out to achieve the goal they set out to achieve and also reliable funding support as we saw projects dropped down even by governments.

But all those improvements and researches even if they didn't lead to physical achievements stacked up onto the pile of knowledge as basis to newer improvements that attained realizations.

Currently, many researches are performed to create a Quantum Computer, and even promising as they could be, those researches haven't yet produced a satisfying operationnal device despite the huge investments and may be only a lure channeling money from potential and credulous investors when a great part of the quantum physicists community still qualify the quantum computing as a wild bet. This last idea can be consolidated by the fact that for many years we can regularly dwell from internet different new same notifications edited by Google or D-Wave or both of them and others announcing new improvements in this domain but nothing really solid in the horizon only the same promises.

Address the limitations of the current situation in computing, after discussing a lot about it and thanks to our respective backgrounds we came to the conclusion that the best way to make not only an evolution of the stagnant situation but even a scientific breakthrough was to reproduce what have been done by our creator, creator of the world. The blue print for such a progress would be the overall brain structure and physiology and its most appropriate, inner and functional basic part the hypothalamus in its activity which can be considered as the operating system (O.S.) of the whole brain.
Our cooperation and merging of knowledge as Dr. Pali Nazir, Hypothalamus Researcher for 30 years (M.D., Ph.D.) and Rama Nazir, Computer Analyst for 40 years (M.Sc.) can bring to a livable start-up and a feasible prototype in its different steps.

Such a project would be the first step to the creation of an **Artificial Intellect** which considering the congestion of the research in different domains is a necessity and should be a human commitment for thrive.

Development

Development of a revolutionary new computer platform named Transuter and its appropriate software (NOS) which should be "Desktop Stand Alone" on the first stage and improved to be portable and adapted to smart phones in the next steps.

Power Unit:

Has to supply the needs of the motherboard including use of thermal batteries with heath convectors or captors at all strategic possible parts in order to reduce and reuse the heath produced by injecting it back into the power supply even through Li-on batteries.

Pre-Boot Sequence:

P.O.S.T.:
The Power-On Self-Test, as in every computer has to test the stand-by of every part of the Transuter. The expected resolution of this process shouldn't be affected by any devices (keyboard, display screen, disk drives, USB, serial communications or others) plugged in the Transuter and their initialization during the P.O.S.T. should not require their unplugging.

Boot Sequence:

B.I.O.S.:
The Basic Input/Output System firmware, should be stored on a Flash Memory chip and as above for the P.O.S.T. loaded for almost all µProcessors but the 3 Head µP which should have their own particular B.I.O.S.. All of these B.I.O.S. should be modifiable in real time by software.

Quartz and Clock:

The quartz oscillator should be of Amethyst if alone. Tested for stability for more than a year. Should be assisted with four others, one rhombohedroid faceted, one 50 faceted cylinder, one aspheric and one cubic, all of them must be synchronized and controlled synchronized also by software.
We have to know and deal with for the future that quartz are very sensitive to shocks, temperature variation and acceleration. Although Chemical polishing or Cauting can produce crystals able to survive tens of thousands G.

Processing Part:

More than 100 µProcessors (µP). Their architectural arrangement and inter-connections will be ordered and modified by software configuration.

O.S.:

The Operating System, Unix-Linux based, must be optimized for the above configuration of the (100+n) µP. In each possible part of the software and especially for each µP we need to have a Feed-Back Loop (Allosteric Regulation Loop), O.O.P. (Object Oriented Programming) on every essential event. The O.S. should allow instant configuration of all the µP to add their computing power to a single task which can be triggered by any one of the µPs.
It should be in a first stage mainly Linux like based able of running both Unix-Linux, DOS and Windows programs.
All parts of the BIOS and OS should be composed of self-modifying, self-implementing algorithms.

Applications:

Applications of the TransuIter should be as numerous as all the different fields in life, not only because of its number crunching possibilities but also because of its idea crunching opportunity and solving new problem design giving it unlimited possibilities. In fact Transuter will be at least in comparison to the most advanced computer today, like the most advanced smart phone which is in progress of 50 years from the old telephone.

The essential and surrounding unexposed "Know How" remains for the moment private knowledge of the I.P. owners.

The first step of this development project will be the staff formation and action settings of the development itself which will define the setting of the goals and on the other hand the evaluation of a working prototype within 3 years, which will be followed by the marketing stage and mass production.

After review we concluded that execution of this project is definitely possible with any government protection.