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DNA COMPUTERS: INTEGRATION OF THE BIOCHIPS AND INTEGRATED CIRCUITS ON A SINGLE PLATFORM

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ABSTRACT:

This paper gives a cognitive analysis on how both biochips and integrated circuits can be embedded on same mother chip but different platforms connected by signal transmission (typically like the quorum sensing in microorganisms, which can be a perfect analogy). The functional properties of the biochip and the integrated circuit are in no way disturbed by the other.A million of biochips and integrated circuits can be made to involve in a single mother board where in each platform(on chip tray) would be containing a biochip and an IC or many biochips and many ICs'. Whichever permutation and combination this can be framed into.

Keywords: Biochip, ICs, DNA, error probability,logic gates, FUZZY LOGIC Abbreviation: IC- Integrated Circuit

INTRODUCTION:

The DNA computers though now in the research level are multifaceted. The only barrier that they come across is the error rates as, its the neural system that we make use of on a single chip precisely the DNA. In short if the connection with the biochip is cut at the brim of error occurrence,
and the connection is shifted to the normal IC such that the error occurrence can be heavily reduced. The DNA can be changed every now as it is totally economical. One has to have a thorough indepth knowledge of Fuzzy Logic and Fuzzy systems to frame the DNA computers.

MATERIALS, METHODS AND CONCRETE WORKING ILLUSTRATION:

The DNA computers are multitasked Bioelectronic systems operating from the lowest level of arithmetic operation to detecting signals, hacked and non-hacked codes, crime detection forensics . It a atleast a trillion times faster than the normal computers . But the only barrier that comes across is the Rate of probability that are reasonably high. The DNA computer works like as any common electronic computer following a biological route with a little difference in its framework. More than 10 trillion DNA molecules can fit into an area of around 1 cubic centimeter (0.06 cubic inches). With level of DNA, a computer would be able to hold 10 terabytes of data, that codes for a lot of memory comparatively, and perform atleast 10 trillion calculations at a time.DNA if can be added more, more calculations could be performed. The DNA

logic gates correspond to DNA code. The logic gates are combined with DNA microchips to create a breakthrough in DNA computing.Coming to the incubus of significant error rates, compared to a normal computer that uses a signal integrated IC, this DNA computer would obviously have greater error rates(of possibly the probability of 5.5 to 6.5/10) as here we aren't dealing with completely mandatory artificial electronics. We have our unpredictable neural system as DNA working invitro here. Precisely instead of pertaining ourselves to the traditional usage of the biochips in DNA computer we might as well use both the integrated circuits and the biochips,that are connected on a separate substrates but single platform, by transmission lines. Wired or wireless can be our choice depending on the circumstances . Coming to the minute technical aspects of it, (the gene) DNA embedded on the chip, lets say the to it that the radio frequency is accurate), so that the problems that are in the height of necessity to us can be performed by the biochip, the other normal operations like programming or social networking by our IC. The PIT(here a periodic one) acts as a mediator between the biochip and the integrated circuit. This PIT is catogerized under CMOS(A BASIC CIRCUIT) used in whichever form can act as a mediator.We usually tend to go for a periodic one for accuracy purpose. The same principle can be extended to the field of biomedicine where in, the biochips or microchips or DNA chips would detect any mismatch or complications in our bio-samples or macromolecules to be detected(the same principle applied in the biosensors, after this the connection is missed and would go with the signal IC where other programming is done and the outputs are given out. The complete proposal is possible unequivocally if and only if the logic I/O signals are appropriate and the transmission lines work at the right time and for their programmed purpose and also if the equipments are adequate and accurate. This would prove to be economically viable and highly efficient in less time.

The Fuzzy architectural spatial analysis (FASA) (also fuzzy inference system (FIS) based architectural space analysis or fuzzy spatial analysis) is a spatial analysis method to analyze the spatial formation and architectural space intensity for this plan. This can mainly correspond to the biochips.

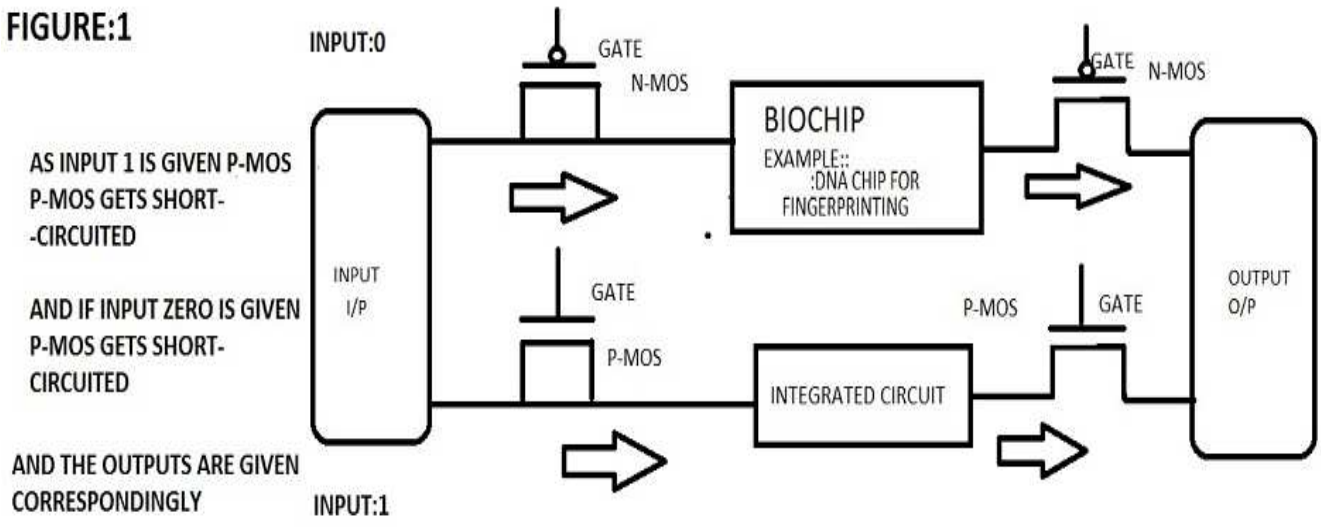
A simple CMOS circuit using logic gates corresponding to this plan is attached:

Microorganisms usually are not preferred to be used on the biochips as media for it can't be optimized ever now and then. It is close to impossible. So either the DNA sequence with reasonable number of basepairs can be used or an mrna or protein sequences, exons or introns can be used for the ananlyte part of it or for the detection part of it.

Sometimes, it cannot prove to be very economical if we use biochips corresponding to gold nanoparticles, carbon nanotubes. But if its just going to be one single chip that is supposed to be using this kind of luxury for the acuracy sake then it is worthwhile.

A simple illustration is given below.

Consider an LPL(Lipoprotein Lipase Gene). One base deletion at Exon 5 of G916 would not lead to mrna transcription. Ive taken the sequence of basepairs between (16771- 17013) and located a part of it on the electrochemical sensor as its the most economical way of carrying it on. From this we can get an output of the LPL DEFICIENCY as there is no mrna transcription that occurs. And it should be noted that we get this output on a computer. The biosensor forms a platform for biochip where in the same scenario is placed on a biochip connected to an integrated circuit and the output can be seen on the system . The greatest utility of this computer is that its COMPLETELY cost effective as, as long as the DNA would exist the DNA computers would get their fuel. Its multi-faceted, performs innumerable number of tasks right from basic operations till forensics



using the biological routes and not to forget our favourite social networking as well.

Its a zillion times faster than anything that exists. All that it needs is ATP in the form of energy. This DNA computers can be made from multiple DNAs. That is the thousands of different biochips that exist in the system needn't necessarily be the same, they can all be different performing multiple operations. It all depends on for what we use it and how we use it.

CONCLUSION:

The circuits are constructed separately and are embedded on their specific platforms. Unwired communication is used as the wired ones are not very reliable in this case. This is checked out with very few circuits that are handy enough to track the results and the drawbacks. Invitro studies are done in comparison to the Fuzzy Logic systems the incorporated into the mother board.

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