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The Synergy of Nafld in Vlsi Design project phase II report

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ABSTRACT
Non-alcoholicfattyliveraffectsabout25%ofglobaladultpopulation.Onthelongterm ,Itisassociatedwithextra-hepaticcompliances,multi-organfailureanddeath.variousinvasiveandnon-invasivemethodsareemployedforitsdiagnosissuchasliverbiopsies,CTscan,MRI,and numerous scoring systems. However, lack of accuracy and reproducibility represents oneof the biggest limitations of evaluating the effectiveness of drug candidates in clinical trails.Organ-on-chip are emerging as a cost effective tool to reproduce in vitro the main NAFLD'spathogenic features for drug screening purposes. Those platforms have reached a high degreecomplexity that generate an unprecedented amount of both structured and unstructured datathat analysis and interpretation enables those platforms to reach their potential. Furthermore,theuseof them do not requireanyethicand legalregulation

Non-alcoholic fatty liver disease is defined as a continuum of abnormalitiescaused by lipid accumulation within the liver defined as hepatic steatosis However, lackof accuracy and reproducibility represents one of the biggest limitations of evaluatingthe effectiveness of drug candidatesin clinical trails.Organ-on-chipareemergingasa costeffective tool to reproduce invitro the main NAFLD's pathogenic features fordrug screening purposes. Those platforms have reached a high degree complexity thatgenerate an unprecedented amount of both structured and unstructured data that analysisand interpretation enables those platforms to reach their potential. Furthermore, the

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useofthemdonotrequireanyethicandlegalregulationThegoldstandardforthediagnosisofNAFLDistheliverinvasivemethodsultrasonography,computedtomography scan and magnetic or adverse conditions such as hypoxia (below normallevels of oxygen). Heat exchange between the environment and the infant is like anyphysicalobjectandits environment.

The most frequent cause of death among NAFLD patients are the extra-hepaticmalignancies, where colorectal cancer in malesand breast cancer in females are themost prevalent types 1231. Specifically, Mantovani et al. 1241 showed that in malepatients with NAFLD. the prevalence of colorectal adenomas is 20.4% as opposed to15.8% in those without NAFLD whilst the prevalence of colorectal cancer is 2.4% forNAFLDvs1.97%withoutNAFLD1251.Ontheotherhand.NAFLDhasbeenconcurrentlyfoundassociatedwithbreastcancerin45.2%Thoseplatformshavereachedahighdegreecomplexitythatgenerateanunprecedentedamountofbothstructured and unstructured data that analysis and interpretation enables those platformsto reach their potential. Furthermore, the use of them do not require any ethic and legalregulationThegoldstandardforthediagnosis.

Imaging/spectroscopy — and various scores — NAS score, FJB4, fatty liver index andNAFI,Dfibrosisscore— areconsideredvalidalternatives15-81.However.thispotpourriof.theintraandinterA'ariabilityofpathologistsinliverbiopsiesevaluation(91.andthenonstandardizedsitelocationofbiopsies[101interferewiththeinclusionof patients in clinical trials, but most important, compromise the possibility to assess theefficacy of treatments , many technologies such as tissue engineering, sensing, andmicrofluidics are converging to buildmore sophisticated organ(s)-on-a•chip (OOC).Theaimistoreproduceinvitrothephysiologicalconditionsfordrugscreeningpurposesinordertoincreasethesuccessrateofclinicaltrialsll.Thissystemranges frommulticellulartomultiorganset-up inbothhealthyanddiseaseddisposition.

I. EXISTING SYSTEM

In the meta-analysis of Target et al. 1201, Of patients with NAFLD are at risk ofcardiovascular disease (CVD), which represents the first cause of death. The outcomesrangestromnonfataltofatalCVDcomplicationssuchasstroke,andmyocardialinfarction1211.Obesityandothermetabolicdisorderslikeinsulinresistance,atherogenicdyslipidemia,increaseduricacid.reduced vitaminD,andimpairedfibrinolysis are common risktactorsofNAH-DandCVD1221

Problemidentification

- Thesystemisdesignedforsolvingtheproblemforthe NAFLDbyorgan-on-chipinVLSIDesign.
- TheNAFLDincreasesininductivecouplingratiobyshownin VLSIDesign.Sothatcost functionofcodingishighandweight, sizeofthecodeiscomplex.

PROPOSED SYSTEM

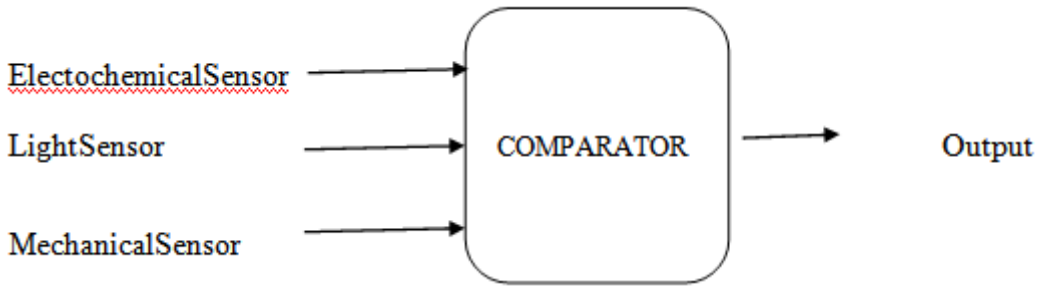

Fig3.1BlockDiagram

Nowadays, we are just mining massive amount of data to get insights aboutdiseases. The next and closer step is to carry out predictive analysis to detect the earlyonset of the disease or at least identify its stronger risks factorsThe limitation of thesetwo approaches is the need of large dataset to train properly the algorithm, in case ofsupervisedlearning,andthelowaccuracyfortheunsupervised.Differently,areinforced algorithm interacts continuously with environment getting a feedback from it[93,941.Everytimeitperformsatask,itgetsbackanindex. generally higherresource.

Success and lower for the failure of the task. In that way, the algorithm modify itselfto tend

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always to the higher index possible. However, this can lead to longer waitingtime. concentrations, unveiling,and reducing potential side effect of drugs.
thatmightbeapplicabletoidentifytheearlypathologica lphenotypicchangesofthecellsorevaluate the efficacy of drugs candidates. On theother hand, many are the algorithmgeneratedtoanalyzeolddataorapplicabletoo ldtechnologiesFactorsthatwereconsidered during the performance evaluation of the incubator were humidity, 55% andtemperature, 37^{o}C during the first 18 days and was maintained at 37.5^{o}C till hatching.Turning of eggs was achieved with the use of tilting trays mechanism using an electricgear motor (0.5 h p). The trays were lifted through an angle of 40^{o}either side ofhorizontal at every hour and lasted for four minutes. 420 clean, healthy, well developedand matured hatch able eggs were used to test the incubator. The result of the testrevealed the following average values- fertile eggs 387, infertile eggs 29 hatched eggs325andhatchabilityof84.06%.

II. RESULT AND CONCLUSION

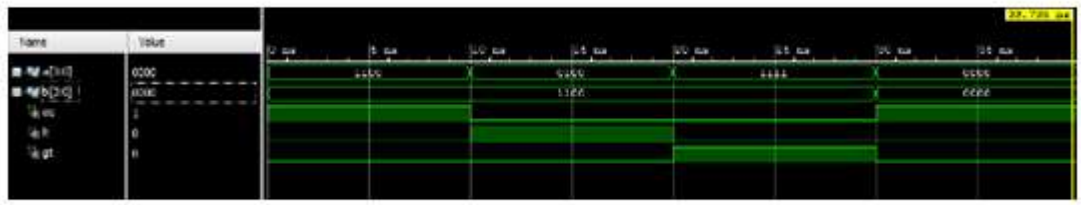

Fig:5.1:4bitcomparatoroutput

Inthe lowrisk the functional behaviorassessment is less than 1.3,nanopore forceSpectro's is 1.45 and the aspartate amino transfer plate index will be the less than the 0.5,the ageis below40years.
Intheintermediateriskthefunctionalbehaviorassessm entislessthan1.3to2.67,nanopore force Spectro's is 1.45 to 0.676 and the aspartate amino transfer plate index willbetheless thanthe0.5 to1.5,theageis greaterthenorequalto40years.

In the high risk the functional behavior assessment is greater than 2.67, nanopore forceSpectro's is greater that 0.676 and the aspartate amino transfer plate index will be thegreaterthanthe1.5,herewillbethe Geneticfactors.

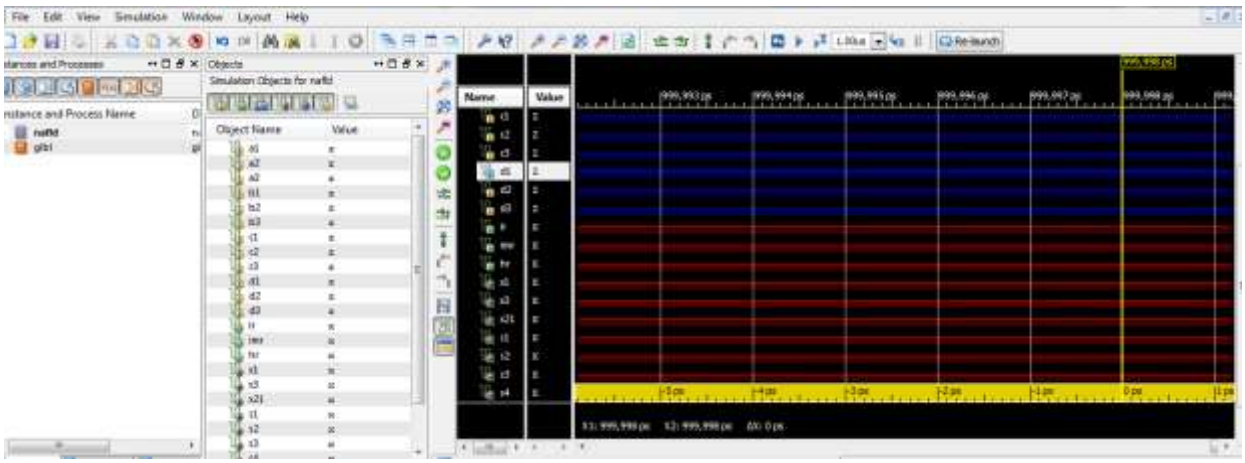

Fig:5.2NAFLDresult

As fig 5.2 the low risk from the range 2 to 3 years it will be reevaluate andmanage the cardio-metabolic risks, intermediate risk we will consider the liver biopsyand also manage the cardio-metabolic risks.

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CODING

4bitcomparator

```
module comparator(a,b,eq,lt,gt);input[3:0]a,b;
output reg eq,lt,gt;always@(a,b)begin
if (a==b)begin
eq = 1&#39;b1;lt = 1&#39;b0;gt = 1&#39;b0;end
else if (a&gt;b)begin
eq = 1&#39;b0;lt = 1&#39;b0;gt = 1&#39;b1;end
elsebegin
eq = 1&#39;b0;lt = 1&#39;b1;gt =1&#39;b0;
end
```