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## Very Large Scale Integration Design Method

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**ABSTRACT:** VLSI stands for very large scale integration, it is very advance technology in the field of electronics also use of VLSI circuits are many places such as in real applications like in microprocessor and microcontroller, microprocessor have been used at various application like in computer or workstation, n chips, chips where microcontroller used in a graphic card, in digital camera or it is also known as camcorder, also VLSI have been used in various mobile or in every mobile phone and in various portable computing device, and embedded processors in an automobile etc. A VLSI methodologies named as mead-conway VLSI design and implementation is a very simple method and it can easily be implemented in every electronics technology, also demand of VLSI design in various electronics applications is very much. In this paper an idea about the “VLSI design methodology”, in this paper methodology of VLSI design has been shown with the help of flow charts. This paper also showed the result of VLSI design and the status of the methods and different infrastructures and design associated with the VLSI design course and method.

**KEYWORDS:** Multi threshold, dynamic voltage and frequency scaling, split level charge recovery logic, Efficient charge recovery logic, positive feedback adiabatic logic.

### I. INTRODUCTION

VLSI design is of two types high power VLSI design and low power VLSI design, so in this paper discuss about the recent enhancement and trends in the field of low power VLSI design, according to the study it is clear that low power of VLSI is very established domain, because this low power VLSI is responsible for manufacture and development from transistor sizing, process shrinkage, voltage scaling, clocks gating e.tc to adiabatic logic. Also aim of this paper to show and prove the recent and upcoming trend and work coming in the field of low power VLSI. Also scope of VLSI is very much in the field of electronics. This paper gives idea of the mechanism of low power VLSI, Also various methodologies have been used to solve different complex problems of embedded system and electronics systems, among various paper in the field of VLSI study and VLSI design methodology a paper titled The Design of VLSI Design Methods by Lynn Conway discussed about the origin of VLSI design in which discussed that during the early 70's a scientist named Carver Mead starts a study and research series named integrated circuit design wherein he discussed how very large scale work can be done with the help of small chip, and during this period he starts an industry called nMOS design[1].

Also the infrastructure of the VLSI design is based on computer network branches, silicon implementation systems which are a semiconductor group and silicon foundries in different countries. On the basis of study and design of VLSI this paper also shows the new and current enhancing technology in the field of VLSI design and VLSI design and methodology. Also to understand the method named Mead-Conway first study the specific concept, wherein discussed how the properties of particular systems of knowledge, methods, and infrastructure affect the rates and extents of knowledge generation, diffusion, convergence, displacement, and integration. VLSI design is of two types high power VLSI design and low power VLSI design, so in this paper discuss about the recent enhancement and trends in the field

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of low power VLSI design, according to the study it is clear that low power of VLSI is very established domain, because this low power VLSI is responsible for manufacture and development from transistor sizing, process shrinkage, voltage scaling, clocks gating e.tc to adiabatic logic. Also aim of this paper to show and prove the recent and upcoming trend and work coming in the field of low power VLSI. Also scope of VLSI is very much in the field of electronics. Dynamic power is the power consumed by a device when a device changes its state from one form to another form and this process can be seen through VLSI design. Dynamic power is the power consumed when device is charging and discharging the loads which are connected with the device, and the short circuit power of the device when device is its charging state Fig. 4 shows the dynamic power dissipation that can occur in CMOS[2].

What is leakage power?

Leakage power of VLSI equipment's, wherein discussed that waste power which is not used by system when system changing its state from one form to another, leakage power consumed by the system when device is not related to state changes, and when device is both static and switching but the important problem associated with leakage power is when device is in inactive state, so when device is in inactive state then all the power is counted as waste power, also discussed the different cases associated with leakage power, discussed the traditional power reduction techniques to minimize this power, technology scaling, voltage scaling, clock frequency scaling, reduction of switching activity, etc., were widely used, also give an idea about the different but most common techniques, and mainstream are clock gating which is a very useful method to reduce the leakage power into the circuit, also shows the graphical representation of variation of threshold voltage with respect to the delay and leakage current, second most common technique for leakage power reduction is clustered voltage scaling, also some small but important terms in VLSI domain has been explained in this paper such as multi voltage, dynamic voltage and frequency and scaling, adaptive voltage scaling, a graphical representation of comparison of fixed voltage, DVS, and AVS energy savings in a processor has been shown[3].

## II. LITERATURE REVIEW

There has been many paper published in the field of very large scale integration (VLSI), because this is very growing and upcoming famous technologies in the field of electronics, there have been various applications of VLSI in various field such as computer network, in mobile phone, for resizing of transistor chips. Also various methodologies have been used to solve different complex problems of embedded system and electronics systems, among various paper in the field of VLSI study and VLSI design methodology a paper titled. The Design of VLSI Design Methods by Lynn Conway discussed about the origin of VLSI design in which discussed that during the early 70's a scientist named Carver Mead starts a study and research series named integrated circuit design wherein he discussed how very large scale work can be done with the help of small chip, and during this period he starts a industry called nMOS design. After getting the latest success in the field of VLSI scientists thought it is possible to form such devices to create new, much simpler methods of IC design than those then used in industry.

Also in this paper explained the opportunities of the VLSI design field in future in which explained VLSI stands for very large scale integration, it is very advance technology in the field of electronics also use of VLSI circuits are many places such as in real applications like in microprocessor and microcontroller, microprocessor have been used at various application like in computer or workstation, n chips, chips where microcontroller used in a graphic card, in digital camera or it is also known as camcorder, also VLSI have been used in various mobile or in every mobile phone and in various portable computing device, and embedded processors in an automobile etc. A figure titled knowledge diffusion and evolution has been shown in this paper in which discussed how different ways practitioners converted into artifacts of practice.

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A receiving community discussed about the different types of cMos and nMos, Mos stands for (metal oxide semiconductor) this is of two types based on the gate type either p type or n type. In this paper explained Phases in a System's Evolution technique with the help of example and flow of process also has been shown in this paper, experimental method of VLSI design also been shown in this paper, a termed community infrastructure in which discussed about the rate of system evolution under the experiment based, The MPC adventures discussed the sketch how experiment method and computer communication infrastructure were applied. This paper shows the different results based on the Joint Evolution of the Multi-Level Cluster of Systems, and a table form which shows the different structure and result of VLSI design.

Different work and research in the field of VLSI design has been discussed, various ongoing work in knowledge engineering. Discussed the abstract framework of this paper in which he discussed the Joint Evolution of the Multi-Level Cluster of Systems, some factors responsible for various problems and structure or design named cognitive factors responsible for VLSI methodologies. This paper gives an overview and experimental result in tabular form about synthesis languages of an expert system for aiding VLSI design, VLSI design sometimes hard to solve because of its complexity and some social factors, infrastructure, and scaling effect also affect the methodologies of VLSI design. At last give knowledge engineering mediating the transformation of knowledge in the field of very large scale integration[4].

A research paper titled Recent Trends in Low Power VLSI Design by R. Sivakumar<sup>1</sup>, D. Jothi discussed the need of VLSI in electronics field such as computer network, mobile phone, chips etc., so in this paper discussed about the classification of power consumption such as dynamic power wherein discussed that dynamic power of any electronic circuit is consumed by device when device is very openly and easily converted or flowing from one state to another state. Dynamic power of VLSI technology consist of switching power consumed while charging and discharging loads on a device and the short circuit power consumed internal to the device while it is changing state shows the dynamic power dissipation that can occur in CMOS circuits, different diagram to show the VLSI technology.

Also give method to reduction of dynamic power consumption, discussed the leakage power of VLSI equipment's, wherein discussed that waste power which is not used by system when system changing its state from one form to another, leakage power consumed by the system when device is not related to state changes, and when device is both static and switching but the important problem associated with leakage power is when device is in inactive state, so when device is in inactive state then all the power is counted as waste power, also discussed the different cases associated with leakage power, discussed the traditional power reduction techniques to minimize this power, technology scaling, voltage scaling, clock frequency scaling, reduction of switching activity, etc., were widely used, also give an idea about the different but most common techniques, and mainstream are clock gating which is a very useful method to reduce the leakage power into the circuit, also shows the graphical representation of variation of threshold voltage with respect to the delay and leakage current, second most common technique for leakage power reduction is clustered voltage scaling, also some small but important terms in VLSI domain has been explained in this paper such as multi voltage, dynamic voltage and frequency and scaling, adaptive voltage scaling, a graphical representation of comparison of fixed voltage, DVS, and AVS energy savings in a processor has been shown [6].

An adaptive technique to solve the leakage power problem has been shown in this paper, and definition, overview of term lo power bus has been discussed in this paper, bus coding and frequent value encoding, Non-Conventional Methods of Low Power Design discussed in this paper and its parts such as adiabatic switching, and different type of adiabatic process has been shown. In various fields such as computer networks, in mobile phones, for resizing of transistor chips[8]. Also various methodologies have been used to solve different complex problems of embedded system and electronics systems, among various paper in the field of VLSI study and VLSI design methodology a paper titled The Design of VLSI Design Methods by Lynn Conway discussed about the origin of VLSI design in which

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## III. CONCLUSION

Result of this paper is of the properties of underlying knowledge, the methodology used in this paper is and the very large scale of the interactions with the university community, our design methods evolved unusually rapidly, going from concept to integration within industry within just a few years. On the basis of study and design of VLSI this paper also shows the new and current enhancing technology in the field of VLSI design and VLSI design and methodology. Also to understand the method named Mead-Conway first study the specific concept, wherein discussed how the properties of particular systems of knowledge, methods, and infrastructure affect the rates and extents of knowledge generation, diffusion, convergence, displacement, and integration. The study of VLSI design method is taught and clear many concepts of VLSI design methodology.

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