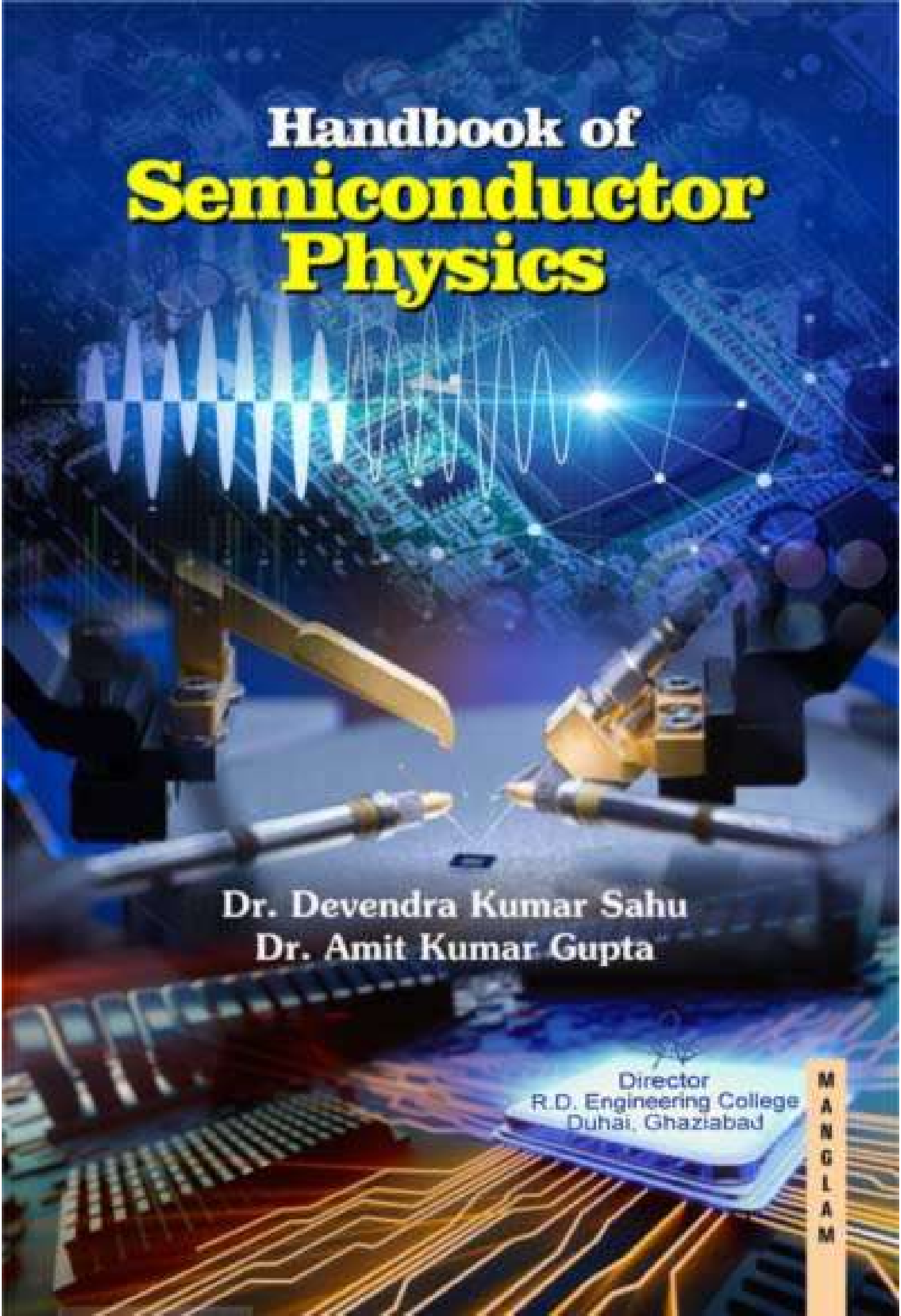
Handbook of Semiconductor Physics



Dr. Devendra Kumar Sahu
Director
R.D. Engineering College
Duhai, Ghaziabad

Dr. Amit Kumar Gupta

MANGLAM

Handbook of Semiconductor Physics

ABOUT THE BOOK

Handbook of Semiconductor Physics provide an introduction to the physics of semiconductor materials and devices. Diodes are basic unidirectional semiconductor devices that will only allow current to flow through them in one direction only, acting more like a one way electrical valve. (Forward Biased Condition). But, before we have a look at how signal or power diodes work we first need to understand the semiconductors basic construction and concept. Semiconductors materials such as silicon (Si), germanium (Ge) and gallium arsenide (GaAs) have electrical properties somewhere in the middle, between those of a "conductor" and an "insulator".

They are neither good conductors nor good insulators (hence their name "semi"-conductors). They have very few "free electrons" because their atoms are closely grouped together in a crystalline pattern called a "crystal lattice" but electrons are still able to flow, but only under special conditions. A semiconductor fabrication technology using a combination of n- and p-doped semiconductor material to achieve low power dissipation. Any path through a gate through which current can flow includes both n and p type transistors. Only one type is turned on in any stable state so there is no static power dissipation and current only flows when a gate switches in order to charge the parasitic capacitance.

This book is written in a lucid style, this student-friendly book is intended for undergraduate students of engineering, it would also suit the requirements of undergraduate and postgraduate students of science and electronics. With the inclusion of some new topics covering recent advances in the field, the book would be a useful reference for practising engineers and scientists.

ABOUT THE AUTHORS

Dr. Devendra Kumar Sahu received his Ph.D. Degree in Physics from Bundelkhand University, Jhansi, (U.P.), India. He worked at Department of Physics, Institute of Basic Science, Bundelkhand University, Jhansi during 2001-2009. He joined at the R.S. Government PG College, Lalitpur (U.P.) in 2010. He is member of several national scientific bodies. He has been a founder member of the Society for Technologically Advanced Materials of India. His research interest includes ferrites, polymers and solar cells and has published about 20 research papers in these areas in National and International Journal and supervised 03 students for their doctoral degree and 05 students their M.Phil degree. He is present a research paper and delivered many invited talks and chaired sessions in national and international conferences.

Dr. Amit Kumar Gupta is an M.Sc. of the CCS University Meerut and Ph.D. of Bundelkhand University Jhansi. His field of interest includes experimental methods in material science. He has published many national and international research papers and has more than 20 years teaching experience. Presently he is working as Dean & Head of Department Applied Science and Humanities in R.D Engineering College, Ghaziabad.

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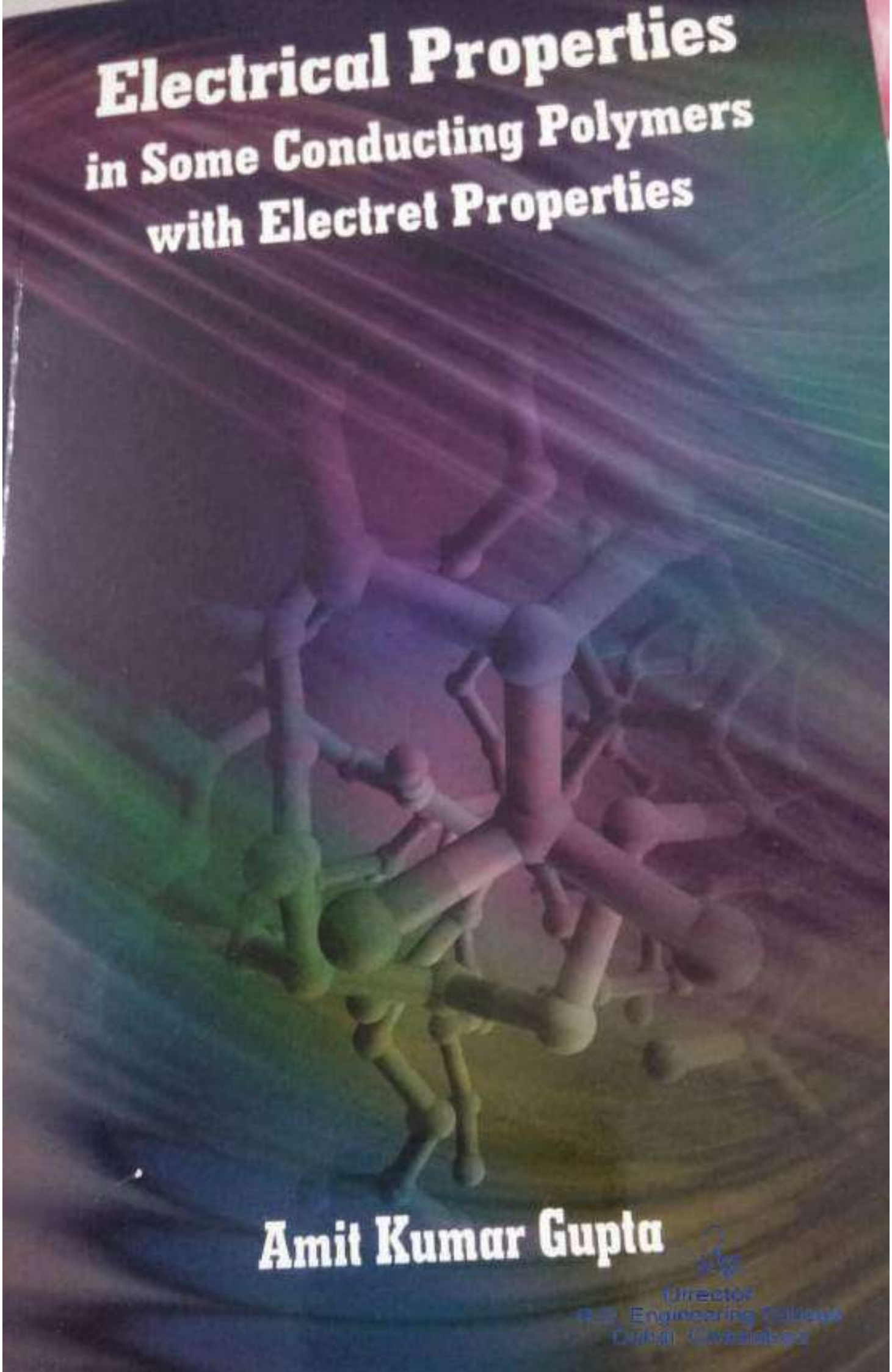
Electrical Properties in Some Conducting Polymers with Electret Properties



Amit Kumar Gupta

BOOK DESCRIPTION

Conducting polymers are organic polymers that conduct electricity due to conjugation along the polymer backbone. Conducting polymers have widely used in energy storage devices due to their conductivity, compatibility and low cost processability. In addition compared with traditional metal or semiconductor materials, conducting polymers are more promising material for energy storage applications. The mechanism of electrical conductivity of conducting polymers is based on the transmission of polarons and bipolarons.

KEY FEATURES

Overall study of this book is invaluable guide for students and Professors who are doing their work on energy storage devices,nano devices and flexible electronics etc.

ABOUT THE AUTHOR

Amit Kumar Gupta (b. 1974) is an MSc of the CCS University Meerut and Ph.D of Bundelkhand University Jhansi. He has carried out research under Dr. D. K. Sahu Professor in University of Jhansi. His field of interest includes experimental methods in material science. He has published many national and international research papers and have more than 20 years teaching experience.

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SOCKET PROGRAMMING AND ITS ROLE IN NETWORKING

[1]DR. PANKAJ SINGH, [2]MOHD.WAKIL, [3]PANKAJ SINGH, [4]JAIDEEP KUMAR, [5]ABHISHEK SHUKLA

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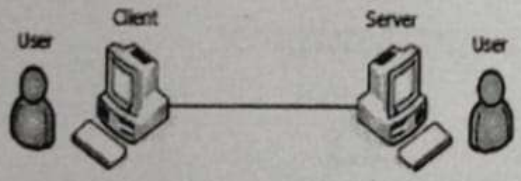
Abstract - A socket represents a single connection between exactly two pieces of software. It is a communications connection point (endpoint) that you can name and address in a network. Sockets allow applications to communicate using standard mechanisms built into network hardware and operating systems. A socket also allows the exchange of information between processes on the same machine or across a network, distributes work to the most efficient machine, and allows access to centralized data easily. The processes that use a socket can reside on the same system or on different systems on different networks. Sockets are useful for both stand-alone as well as network applications. Network standards for TCP/IP Socket are provided by the application program interfaces (APIs). A wide range of operating systems support socket APIs. Socket programming shows how to use socket APIs to establish communication links between remote and local processes. OS/400 sockets support multiple transport and networking protocols. Also socket system functions and the socket network functions are thread safe. Programmers who use Integrated Language Environment (ILE) C can use the information to develop socket applications.

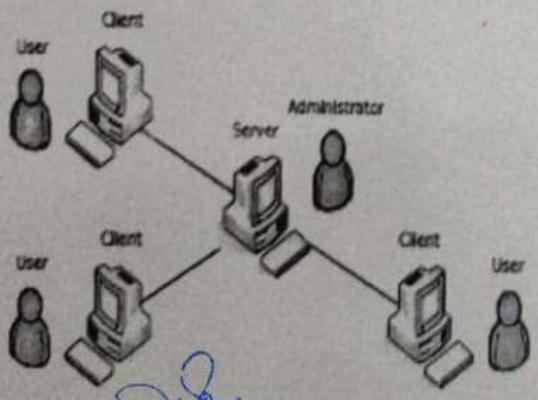
Keywords - Socket, Network Hardware, Network Applications, Network Standards, Integrated Language Environment

I. ARCHITECTURE

In the simplex duplex communication model the messages in a chat room are directly delivered to the remote side without the need for an intermediate node which is required for message forwarding. This kind of communication represents one to one communication.



While in many to many communication taking place in a chat room , it is the work of a server which act as a central message processor and it receives messages from any one of the on line clients and then "broadcasts " them to all the users.



II. SOCKET PROGRAMMING

Running the server

It is the server program that allows clients to upload and download files to and from a specified directory. The server is started or run as follows:

server directory port

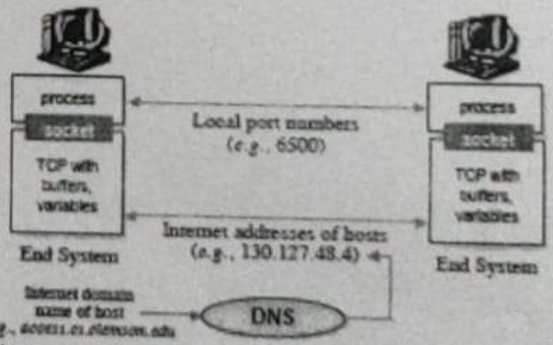
Where:

"directory" is the location of the files to be accessed.

"port" is the TCP port number that clients will use to locate the server

File server listening on port 10000

After the server has started, it simply spins in an infinite loop waiting for incoming connections until you decide to kill it. Needless to say, the server isn't too terribly exciting to watch (despite the fact that it is the most interesting part of the project to implement).



Sockets are addressed using an IP address and port Number

When the server starts , it attempts to open up a socket on the given port .if it prints a message , it

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ANALYSIS OF ADSORPTION TREATMENT METHOD USING LOW COST ACTIVATED CARBON FOR REMOVAL OF DYES FROM WASTE WATER AND LAND FILL TREATMENT

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Abstract - In recent times the common strategies for waste management at landfill destinations namely cremation, land-filling using different categories of waste and treatment of soils results in high pollution rate in the environment, moreover the ozone depletion is the horrible consequence of such faulty methods. In this work, a feasibility analysis is carried to inspect the existence of low cost activated carbon material to be used as a substitute for land-fill purpose. The solid waste assessing techniques including heavy metal fixations tests are investigated and data quality samples collected are tested. The testing profile profundities of somewhere in the range of 15 and 50 cm are intended to educate on early changes in the landfill waste parameters during their previous removal period. Testing inside this profundity run likewise gives spatial profile data on the properties of waste inside the primary receptor layer of the landfills. The analysis focuses a sample of 500 g which is acquired from each testing point dependent on amount of sample required for every investigation. With the help of newest tools and techniques such as BET surface area analyser, Ultraviolet /Visible Spectrophotometer and Carbon Sulphur Determinator: Eltra CS800 the task targets are investigated to achieve the accurate concentrations. The observation concludes that low cost activated carbon material (rice husk) has great potential to be used in For removal of dyes from waste water and landfill treatment. The low cost feature is the most promising and long time durability.

Keywords - Landfill, Activated Carbon material rice husk, Adsorption treatment, feasibility analysis.

AIM TO DO THIS RESEARCH

To evaluate the enrichment levels of carbon(with rice husk) and the degree of inorganic content in selected landfills with the view to investigating the possibility of using landfill composite as a suitable precursor for activated carbon, in order to improve the environmental sustainability of the landfills.

I. INTRODUCTION

Landfills

For sanitary waste implies and process where at the conclusion of routine activities, the waste to be discarded is compacted and filled with a sheet of dirt. When the disposal site reaches its final capacity, a plastic sheet is covered with the final layer of MSW. The land management system in the context of sanitary waste has proved to be the easiest and more suitable type of waste disposal. Modern land disposal systems must be planned, analysed and designed in accordance with the various scientific, engineering and economic principles. Final disposal site selection usually is based on preliminary site study results, engineering design and cost studies results and an assessment of environmental impacts.

We used topography, hydrology, materials surrounding, current buildings and city growth (roads ...) as guidelines for site selection due to data limitations. Criteria for deciding that the dumping site was beyond the hydrology buffer region, forested areas, roads and established housing were identified. What were the conditions?

- Areas less than or equal to 230 square meters based on the contour map.
- 300 meters away from the main road
- 300 meters away from water bodies
- Minimal noise contamination from truck movement
- 40 kilometers away from the nearest population centers
- Located in area not crossed by major roads.
- Not located in areas of active agricultural land or near land under development

In India, recently solid waste management systems are assuming larger dimension in keeping with the municipal solid wastes. Many of the municipalities are taking appropriate actions to improve various component systems like collection of solid waste from generation areas, its transportation to processing and disposal site, utilizing the recycling potential of Municipal Solid Waste (MSW) and ultimately disposing off by land filling.

Deposit is the world's most commonly used disposal system for MSW. The waste disposal may be an uncontrolled open dump or a complete containment site designed to protect the aquatic environment. In contrast to engineered landfills, open dumps have no bottom liners to prevent leachate or top cover from draining into the fill to maintain moisture. These traditional waste disposal sites have no high-level coverage or other preventive measures for reducing

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SUITABLE DECISION USING DECISION SUPPORT SYSTEM FOR ENERGY AND ENVIRONMENT SAVING

[1]PANKAJ KUMAR SINGH, [2]MINAKSHI PUNIYA, [3]SHAASWAT SHARMA

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Abstract -
Decision Support System (DSS) is a system that facilitates the process of decision making by breaking down a complex problem into simple components. Main points that can be taken into consideration when examining various Decision making system literature related to E&E are the selection of appropriate method, selection of criteria to be used and the widely distributed application areas. The motivation behind this study is designing such a Decision Support System (DSS) that enables experts and end user to take proper decision in any field for energy and Environment saving. The decision support system established in this study integrates potential evaluations, cost analyses, legal incentives, and analysis of returns on investments with the construction of Data Warehouse and Data Mart. Various soft computing techniques: Artificial Neural Network, Fuzzy Logic, and Evolutionary Algorithm etc. can be used to make the system Intelligent.

Keywords - Data-driven modeling, Data mining, Hydrology, Artificial Neural Network, Artificial Intelligence, Energy, Environment.

I. INTRODUCTION

The DSS is Information and Communication Technology (ICT) based tool and will provide need based information on technical, social, financial and environmental aspects related to hydrological system.
A Decision Support System (DSS) plays very important role to take decisions quickly and without much paper work. It is tough to see lots of data and many files with vast domain knowledge while taking decision so this reduces the workload and time consumption.
DSS helps managers react quickly to their changing needs. The Decision Support System enables users to gain access to vast amounts of information, which can assist them in meeting their overall business objectives.
Thus, DSS provides better understanding of the organization's functions from a historical perspective to improve tracking and responding to business trends, facilitating forecasting and planning efforts, and making strategic business decisions.
A Decision support system is a computer-based system that enables management to interrogate the computer system on an ad hoc basis for various kinds of information in the organization and to predict the effect of potential decisions beforehand. Drawing on various definitions that have been suggested [2], 20, 32] a DSS system can be described as a computer-based interactive human computer decision-making system that:

- Supports decision makers rather than replace them
- Utilizes data and models
- Solves problems with varying degrees of structure

a) Non-structured (unstructured or ill-structured)
b) Semi-structured
c) Semi-structured and unstructured

- focuses on effectiveness rather than efficiency in decision

Processes (facilitating decision processes).

DSS support technological and managerial decision making by assisting in the organisation of knowledge about ill-structured, semi-structured, or unstructured issues. A structured issue has a framework comprising elements and relations between them are known and understood [15]. Emphasis in the use of a decision support system is upon provision of support to decision makers in terms of increasing the effectiveness of the decision-making effort [10]. This support involves the systems engineering steps of formulation of alternatives, the analysis of their impacts, and interpretation and selection of appropriate options for implementations [9].

Traditional legacy and on-line transaction processing (OLTP) systems are not adequate for decision support. So we will have to see the components and other required things to take right decision.

Components of DSS

Social: The social component is evaluated through the *'Social Assessment'* questionnaire which takes input from the end user of the society. Water uses, power uses, number of persons any standard of the living etc. are collected using this sheet.

Technical: Evaluation of the technical component is through the *'Resource Assessment'* and *'Demand Estimation' questionnaire*. Resource assessment considers infrastructure, machines, input parameters, gauzing tools and techniques, historical data with

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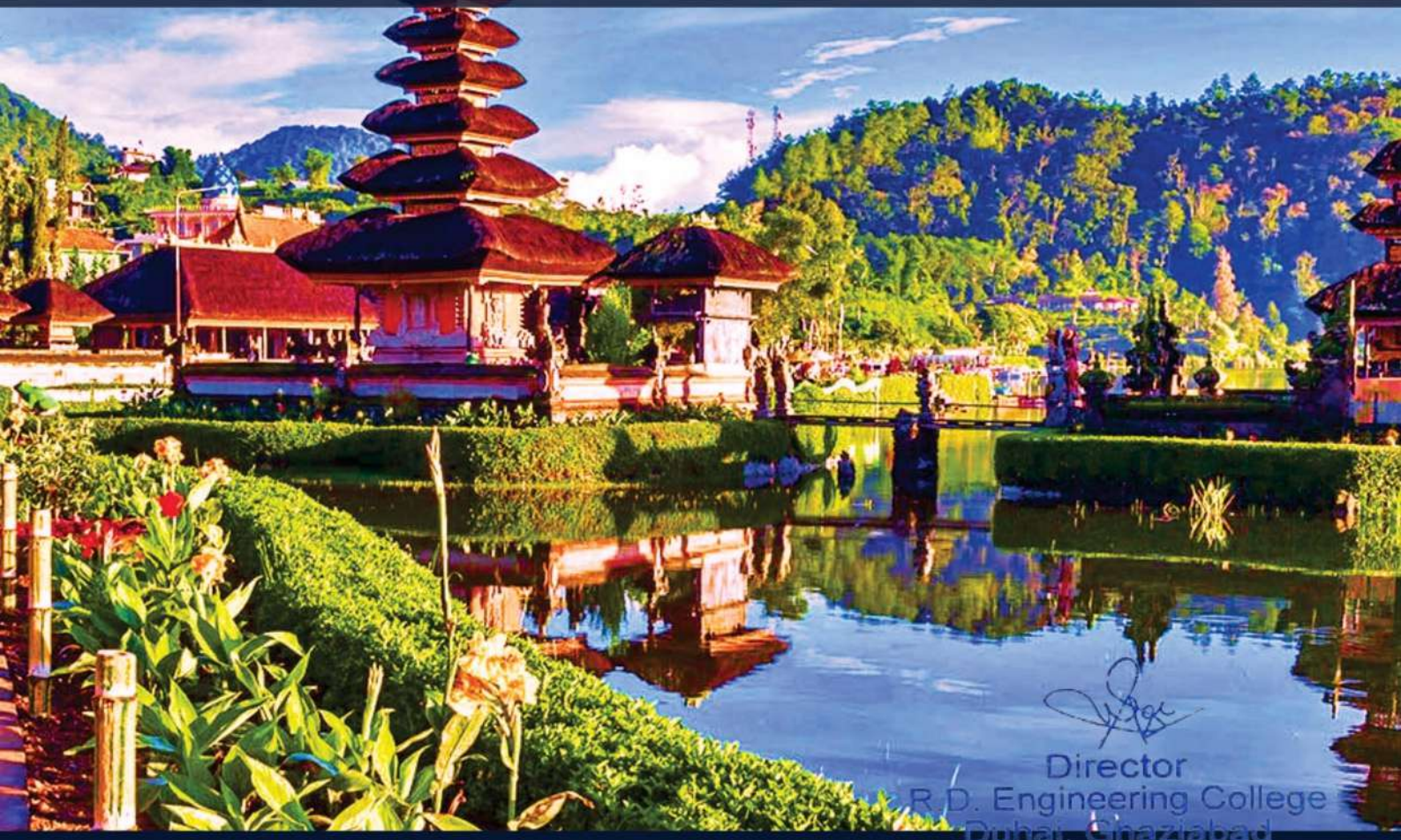

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