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1. ## Computer-Aided Signal Processing and Data Interpretation in Volumetric Radars

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Abstract

There are important applications where radars are required to observe large volumes of space and map the entire contents thereof on a continual basis. This calls for a different approach to signal processing and data processing and presentation from the more familiar point-target detection situation. The weather radar is a fine example of a volumetric radar. This paper describes some important aspects of signal and data processing in modern weather radars. These radars differ from older ones of the family in being coherent and having multi-parameter observation and measurement capability. The signal processing in such radars involves filtering for signal-to-noise ratio enhancement and clutter rejection, and data processing has many levels, ranging from moment extraction, through feature extraction, to sophisticated display organisation. These complex processes are greatly assisted by computer hardware and software which have made the modern weather radar a very powerful and user-friendly device.

2. ## Computer Simulation of a Programmable Arithmetic and Logic Unit

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Abstract

This paper contains details of a novel simulation to illustrate the basic features of the operation of the arithmetic and logic unit (ALU) of a microprocessor. The simulation uses a model of a 74181 device which is a combinational ALU. The device is modified for sequential operation by the addition of an accumulator. Stored program control is achieved through the use of the data entry and storage facilities of a word generator. Basic microprogramming operations are established by the inclusion of additional storage registers which act as condition code indicators. Sample program listings are provided.

3. ## Computer Modelling of Aircraft Landing Systems

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Abstract

Instrument landing system (ILS) and the upcoming microwave landing system (MLS) are very important aircraft landing aids at most major airports of the world. However, their performances are directly affected by the features of the site in which they are located. Currently, validation of the ILS performance is through costly and time consuming experimental methods. This paper presents a computer model for performing site evaluation, as an alternative to the experimental methods. This procedure can avoid delays and expenditure, and provides a low-cost alternative to the expensive experimental approach. The results computed from the analytical method are compared with the actual measurements and good agreement is shown. The availability of accurate models could revolutionize landing system installation programmes and yield significant savings in cost and time.

4. Access Network for High Speed Data Communication

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Abstract

This paper presents various aspects of developing an access network for high speed data communications using the existing copper cables. In recent years, there has been a phenomenal growth in data communication services including the Internet. The ever-increasing multimedia content such as pictures, video clips and audio on the Internet has placed an increasing demand for higher access speeds. This has led to the development of a family of digital subscriber line (DSL) technologies capable of delivering megabits of data over existing unshielded twisted pair. Several short and long term options available to implement these DSL technologies in a typical telecommunication scenario, such as in Brunei Darussalam, are presented. It is shown that the upcoming technologies can meet the challenges of the high bandwidth multimedia applications such as smart schools, tele-shopping etc.

5. Minimum-Width Confidence Intervals for Skewed Probability Densities

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Abstract

A general procedure is described to obtain the minimum width confidence interval for a skewed probability density. The procedure is applied to the χ^2 distribution. It is shown that in some cases significant width reductions may be obtained.

6. Using Patterns in Source Code Metrics to Assess Code Reusability

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Abstract

Software reuse has been stated to significantly improve product quality and process productivity in software development. For reuse to succeed, however, there has to be a means to assess candidate reusable components. Such as assessment is not only required to identify components for reuse, but to also gauge the quality of the components.

This paper describes a study done at the Software Engineering Test Lab, University of Idaho, on a quantitative method of software reusability assessment using static source code metrics. The statistical technique of Discriminant Analysis was used to formulate a model for reusability assessment.

7. Islamic Banking: An Overview

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Abstract

Across the Muslim world, there is a move to create Islamic financial institutions. Islamic banking has gained considerable momentum since the second half of the 1970s and is currently operative in two basic forms in more than forty-five countries. One of the fundamental changes envisaged in the wake of the Islamic transformation of a modern economy is replacement of the institution of interest by profit-sharing. An attempt is made in this paper to trace the growth and development of Islamic banking and to highlight its salient characteristics. An outline of banking will be presented in an Islamic framework and the main focus will be on the rationale for the abolition of interest from Islamic banking and its replacement by Profit-Sharing. Also an endeavour will be made to explore and explain briefly the Islamic financial instruments. The concluding section will outline the relative importance and relevance of the monetary instruments for regulation money supply in an environment of Islamic banking. The paper is based on some available writings of various scholars.

8. The Impact of Computer Literacy on the Use of IT: An Empirical Investigation

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Abstract

Over the past few decades, Information Technology (IT) has played a critical role for the success of organisations. It is thus important to investigate the use of IT within organisations. Existing literature indicates that IT use depends not only on the nature of organization, but is related to managerial characteristics as well. To ascertain this notion, a survey of fifty-four business organisations was conducted, to examine the relationship between the use IT and of the various aspects of computer literacy of business managers such as ownership of a PC, computer experience and computer training. The study finds that ownership of a PC and computer training significantly contributes to the use of IT. These results are discussed and some suggestions are offered.

Keywords
Information Technology; Business Managers; Computer Literacy; Business organizations

9. Designing a network - The ITB experience, A case study

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Abstract

Setting up a network involves both the building of the physical infrastructure and the network infrastructure in order to deliver facilities and services to users. The ITB Network is campus-wide in excess of 500 users concurrently. This paper examines the success and highlights the areas that could lead to network problems. It also attempts to come up with a framework for future emulation towards the building of small to medium sized networks.

10. Studies on Methods to Separate Metal Complexing Agents in Environmental and Waste-Waters

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Abstract

The use of complexing agents in industrial applications results in their ultimate release to the environment. Complexing agents may affect the distribution of metals within aquatic ecosystems. In waste-water tanks, the presence of complexing agents is an important factor in the potential generation of flammable gases and the safety of the waste tanks. A simple and quick method o f analysis for detecting these compounds, that provides reliable results, would be of great interest. This paper describes the possibilities of using chromatographic techniques such as gas chromatography (GC) and liquid chromatography (HPLC) for detecting complexing agents in waste-water. A capillary electrophoretic (CE) method has also been developed to achieve rapid quantitative separation and determination of metal complexing agents in waste-water tank. It has been found that electrophoretic method allows rapid separation with high sensitivity and lower cost compared to chromatographic method.

11. In-cylinder Fuel Injection of Spark Ignition Engines: Computer and Experimental Study on Fuel Spray Analysis

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Abstract

Stringent legislation on exhaust emissions and economic fuel consumption have led to intensified efforts for the development of new strategies for fuel injection in spark ignition (SI) petrol engines. In-cylinder (direct) fuel injection is one of these strategies in which fuel is injected directly inside the engine cylinder. In this study, direct fuel injection in an SI engine is investigated through a

three-dimensional computer model for two phase flow. FLUENT software is used with appropriate boundary conditions to compute air-flow velocities for engine speeds of 1500 and 3000 rpm. Fuel spray injected inside the cylinder with a spray and of 22.7°, fuel droplets with initial diameter of 50 microns at the injector tip, and initial droplet velocities for injector angles of 90° and 60° in x-z plane are used to study fuel spray distribution. Results show that the maximum air velocity is at the tip of the inlet valve. High turbulent domains on both sides of the inlet valve and a stagnant domain below the valve face are observed. Positioning the fuel injector just above the valve shoulder with an offset angle of 30° results in a significant improvement in the fuel spray distribution in the cylinder and reduced fuel impingement on the piston head. The above predictions have been verified in an experimental study by capturing the real time images of fuel spray directly injected inside the cylinder of a running engine using a fast response laser imaging system.