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on the database for further analysis. By means of this system, we can store the data related to patient information and visual interpretation of the PET examination while writing clinical reports in daily work. The database files in our system can be accessed by means of commercially available databases. we have used the 4th Dimension database that runs on a Macintosh computer and analyzed 95 cases of ^{18}F -FDG brain PET studies.

The results showed high specificity of parietal hypometabolism for Alzheimer's patients.

Key words: database, reporting system, brain PET, statistical analysis, brain PET image visual interpretation.



SEMILINEAR STOCHASTIC EVOLUTION EQUATIONS WITH MONOTONE NONLINEARITIES*

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ABSTRACT

A semigroup approach is used to prove the existence, uniqueness and boundedness of the solution of semilinear stochastic evolution equation with monotone nonlinearities. The existence and uniqueness theorem is based on Picard iteration together with results from the theory of deterministic semilinear evolution equations. The usual Gronwall inequality arguments are carried out with the aid of a Burkholder type inequality and an I to type "energy" inequality.

* published in "Stochastics and Stochastic Reports" Vol. 53, Nos. 1&2, pp. 129-174, (1995).

These two theorems are the main tools for study of semilinear stochastic evolution equation with monotone nonlinearities.

In addition, diverse examples which have arisen in application are shown to satisfy the hypotheses of the theorem and, consequently, the results can be applied to these examples.



A NEW APPROXIMATION FOR EVENT FUNCTIONS IN TEMPORAL DECOMPOSITION BASED SPEECH CODING*

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ABSTRACT

Temporal Decomposition (TD) is an effective technique for modeling speech spectral evolution through orthogonalization of the matrix of spectral parameters [1],[2]. We have shown earlier that "event" functions can be approximated by fixed-width plain functions without a considerable degradation in the synthesized speech [3]. In this paper, we show that with an appropriate spectral parameter set, a better performance can be achieved using variable-width event approximation using a new composite function. This method improves the reconstructed speech quality in TD-based very low-rate speech coding systems.

* Published in Proc. IEE 4th International Symposium on DSP for Communication Systems (DSPCS' 96), pp.320-326, (Sept.1996).

dynamic range at a lower cost. The double - fiber approach provides a higher sensitivity and can be used for the more precise applications. The results obtained from both sensor systems are satisfactory and show promise in for use real field applications.



FORMANT DETECTION THROUGH INSTANTANEOUS-FREQUENCY ESTIMATION USING RECURSIVE LEAST SQUARE ALGORITHM*

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ABSTRACT

Formant frequencies, represented by major peaks in the spectrum, convey important information about speech. "Instantaneous Frequency" (IF) estimation is a method to track formants. This paper proposes a method to detect the formants of voiced speech using a Recursive Least Square (RLS) algorithm.

The method accuracy is assessed by comparing it with conventional formant detection techniques. The method is also analysed from the viewpoint of phonetic conformity

* Published in Proc. IEEE 4th International Symposium on signal processing and its Application (ISSPA'96), Vol. 1, pp. 81-84, (Aug. 1996).

using "Temporal Decomposition".



A HUMAN FRIENDLY REPORTING AND DATABASE SYSTEM FOR BRAIN PET ANALYSIS*

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ABSTRACT

We have developed a human friendly reporting and database system for clinical brain PET (Positron Emission Tomography) scans, which enables statistical data analysis on qualitative information obtained from image interpretation. Our system consists of a Brain PET Data (Input) Tool and Report Writing Tool. In the Brain PET Data Tool, findings and interpretations are input by selecting menu icons in a window panel instead of writing a free text. This method of input enables on-line data entry into and update of the database by means of pre-defined consistent words, which facilitates statistical data analysis. The Report Writing Tool generates a one page report of natural English sentences semi-automatically by using the above input information and the patient information obtained from our PET center's main database. It also has a keyword selection function from the report text so that we can save a set of keywords

* Published in "Annals of nuclear medicine" vol.10, No:1 pp.99-104 (1996).

over all time segments, leads to a system of nonlinear algebraic equations for unknown state and costate variables at the initial and final time of the process. The obtained system of nonlinear equations can be solved through application of the Newton-Raphson method. In comparison with other existing direct and indirect methods of solution, the present technique has shown excellent robustness and efficiency.

FLEXURAL STRENGTH OF POLYPROPYLENE FIBER REINFORCED CONCRETE*

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ABSTRACT

Synopsis: Flexural strength of Polypropylene Fiber Reinforced Concrete (PFRC) specimens has been determined through experimental work. The fibers have been added to concrete through random distribution. The 7 and 28 day PFRC samples with 0, 0.5, 1.0, 1.5, 2.0, 2.5 percent by volume of fibers have been tested using two point loading. The samples had 15 cm x 15 cm (6 in x 6 in) cross section and 50 cm (20 in) length.

The results showed that the 28 day flexural strength of PFRC increases almost linearly with fiber percentage. However, the maximum increase (103%) occurs at 1.5 per-

* Presented at 2nd International Conference on Non-Conventional Construction materials (NOCMAT' 97), Bhubaneswar, India (17-20 June, 1997).

cent fiber content, after which, the strength starts to decrease.

The 7 day samples have the same basic behavior with the exception that the maximum increase (58%) is achieved at 1.0 percent fiber content.

FIBER OPTIC SENSING OF DISPLACEMENT AND PRESSURE*

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ABSTRACT

The use of single-and double- fiber sensors for measuring displacement and gas pressure are presented. In a single-fiber approach it is possible to use either a He - Ne laser or a LED as light source. The double - fiber sensor is operating with a He - Ne laser and shows a higher capability. The LED single-fiber sensor has a sensitivity of about 0.6 mV/ μm , a resolution of 1.25 μm for displacement. For the nitrogen gas pressure measurement, it shows a sensitivity of 0.7 mV/Torr with a dynamic range of about 100 Torr. The sensitivity of the double - fiber sensor is about 1.8 mV/ μm with a dynamic range of about 300 μm for the displacement measurements. The LED single - fiber sensor offers the advantage of simplicity, light weight, and a wide

* Published in Proceedings of 6th International FAIM Conference, Georgia, USA (13 -15 May, 1996).

ABSTRACTS OF PAPERS PRESENTED AT INTERNATIONAL CONFERENCES

The abstracts of papers published in this magazine pertain to research projects conducted all over I.R. Iran, including those papers which have been printed previously in reputable scientific publications, and are not limited to the Sharif University of Technology. The Editor would be happy to include abstracts, in future editions of all scientific papers presented by researchers throughout the country, with a view to keeping the academia and professionals informed about research activities carried out by Iranian scientists.



DETERMINATION OF OPTIMAL SPACECRAFT TRAJECTORIES USING A STEP-BY-STEP LINEARIZATION METHOD*

* Presented at: AAS/AIAA space Flight Mechanics Meeting, Alabama, USA (Feb.10-12,1997).

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ABSTRACT

A new step-by-step linearization method is developed to solve the nonlinear optimal control problems. The total process time is divided into equally-spaced time intervals. At each time segment, linearized equations are used to model the system evolution and, explicitly solved, to relate the dependent variables at starting, and terminal points. This gives a mapping rule in recursive form from which, by iteration