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1	Zin NMLM, Mubin ASA, Nawi MSM, Kasmuri AR, Mandal UK (2016) Preliminary study on the formulation of syariah compliant generic sustained release gliclazide tablet using xanthan gum. *International Medical Journal Malaysia,*17,1-4.	0.191
	Computational Sciences	
2	Kumar M, Jindal MK, Sharma RK, Jindal SR (2016) Offline handwritten pre-segmented character recognition of Gurmukhi script. *Machine Graphics and Vision,* 25,45-55.	0.20
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6	Singla P, Saxena J (2016) Performance analysis of gaussian approximation in wide band code division multiple access system over various fading channels. *International Journal of Systems, Control and Communications,*7, 45-67.	UGC Care
7	Goyal H, Saxena J, Dewra S (2016) Performance evaluation of OWC using different modulation techniques, *Journal of Optical Communications*, 37, 391-394.	UGC Care
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DEPARTMENT OF PHARMACEUTICAL SCIENCE AND TECHNOLOGY

Preliminary Study on the Formulation of Syariah Compliant Generic Sustained Release Gliclazide Tablet Using Xanthan Gum

Nik Mohamad Lukman Mat Zin

Anis Syazwani Abd Mubin

Mohamed Sufian Mohd Nawi

Abul Bashar Mohammed Helaluddin

Abdul Razak Kasmur

Uttam Kumar Mandal

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ABSTRACT

Gliclazide (1-(3,3a,4,5,6,6a-hexahydro-1H-cyclopenta[c]pyrrol-2-yl)-3-(4-methylphenyl)sulfonylurea) is a second-generation sulfonylurea which is orally administered in the treatment of non-insulin-dependent diabetes mellitus in adults. Sustain release drugs help to improve drugs bioavailability by controlling the time of drug release or prolonging it. We
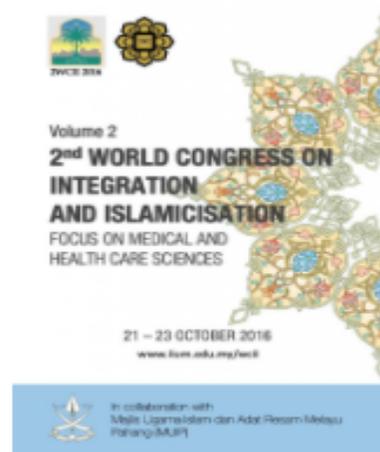
DEPARTMENT OF COMPUTATIONAL SCIENCES

Sr. No. 2

OFFLINE HANDWRITTEN PRE-SEGMENTED CHARACTER RECOGNITION OF GURMUKHI SCRIPT

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Abstract. In this paper, we have proposed a feature extraction technique for recognition of segmented handwritten characters of Gurmukhi script. The experiments have been performed with 7000 specimens of segmented offline handwritten Gurmukhi characters collected from 200 different writers. We have considered the set of 35 basic characters of the Gurmukhi script and have proposed the feature extraction technique based on boundary extents of the character image. PCA based feature selection technique has also been implemented in this work to reduce the dimension of data. We have used k-NN, SVM and MLP classifiers. SVM has been used with four different kernels. In this work, we have achieved maximum recognition accuracy of 93.8% for the 35-class problem when SVM with RBF kernel and 5-fold cross validation technique were employed.

Key words: feature extraction, classification, PCA, k-NN, SVM, MLP

1. Introduction

Optical Character Recognition (OCR) is the process which helps to convert the handwritten or printed text into a format that is processable by machine. Handwritten character recognition is more complicated due to the variation in styles of writing. When a text

DEPARTMENT OF PHYSICS

Sr. No. 3

Study of A-site divalent doping on multiferroic properties of BFO nanoparticles processed via combustion method

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ABSTRACT

Pure and Sr-doped bismuth ferrite $Bi_{1-x}Sr_x FeO_3$ (x = 0, 0.1, 0.2, 0.3) nanoparticles have been synthesized using combustion method. X- Ray diffraction study of these compounds confirms the rhombohedral structure with R3c space group. $BiFeO_3$ peaks were observed at 2θ = 22.46°, 31.80°, 32.11°, 39.519°, 45.79°, 51.35°, 56.98° and 57.16° having miller indices as (012), (104)

Sr. No. 4

Structural Analysis of Enhanced Ferroelectricity in Nano-Composite Films of Sodium Nitrite in poly-Vinyl Alcohol Matrix Fabricated at Moderate Elevated Temperature

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Effect of Annealing Conditions on the Ferroelectric Response of NaNO₂: PVA Nano-composite Films Fabricated at Elevated Temperature

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Abstract—In the present study, the equal wt% composite films of NaNO₂-PVA were prepared on brass substrates maintaining them at elevated temperature 70℃ by 'drop cast' method. The composite films so produced were annealed for 24 hours at different temperature in the 'annealing temperature range' of 70℃-240℃. From XRD studies, the degree of crystallinity in the composite film annealed at 175℃ appears to be more than those annealed at other temperatures, also it was noted that the peaks and their relative intensity in that composite film follow the same pattern as was found in pure NaNO₂ film. The intensity peaks in the composite film annealed at temperature of 175℃ appear to re-emerge out exactly like the peaks present in pure NaNO₂ film except (0 0 4) peak at 30.02°. The better ferroelectric response with remanant polarization 45.45µC/cm² in the same film shows that the optimized annealing temperature is 175℃. Calculations of strain in these films further reveal that strain is compressive in all the other films except one annealed at 175℃. As NaNO₂ is order-disorder kind of ferroelectric material, PVA matrix might have provided better environment to the oxygen atoms of NO₂ ions of NaNO₂ to attain more ordered state under this annealing condition.

Keywords Equal wt% Composite-films, Drop Cast Method, Elevated Temperature, Annealing Temperature, Remanant Polarization, XRD Peaks

INTRODUCTION

Ferroelectric materials are a very important class of dielectric materials from the point of view of their practical application in memory storage devices. Their utility to act as a potential source of memory devices is attributed to the nature of reversing their state of polarization with the reversal of applied field. The dielectric materials usually require high polarizing electric field. In order to produce high electric field with low operating voltage, thin films of these materials are preferred. The films of ceramic like ferroelectric materials are normally brittle and therefore, in order to impart flexibility, they are mixed with suitable polymers to form their composite films. The study of composites has become an important and interesting area of research in these days. What makes this area so interesting is the fact that many workers in this field have reported improvement of characteristic properties of composites over their precursor components. The matrix of the polymer acts as a host to accommodate particles of the ferroelectric material. The characteristic properties are modified through the modification of particle size by the polymer matrix and by introduction of strain in the composite films. These parameters are optimized to get optimum ferroelectric response. The method of fabricating the composites and the underlying conditions, their composition, the kind of polymer matrix, the nature of substrate, the annealing conditions and so many other factors affect in their own way to the characteristic response of the composite film. It has been reported in literature that the equal wt% composite films are usually most suitable to get optimum ferroelectric response [1-11]. The composite films containing equal wt% of KNO₃: PVA system studied by Dabra *et al*. The ferroelectric properties of spray deposited CsNO₃: PVA composite films have been reported to be improved as compared to the pure CsNO₃ [10, 11]. The effect of thermal treatment influences the properties of the material to a great extent. It is also reported in literature that the size of the grains varies with annealing temperature and influences the values of resistances [12].

NaNO₂ is an order-disorder type ferroelectric material and in the NaNO₃ molecule, the dipole is composed of a NO₂⁻ ion and nearest neighboring Na⁺ ion. The ordered alignment of NO₂⁻ groups along b-axis gives rise to spontaneous polarization.

The ferroelectric, dielectric, thermal and structural properties of NaNO₂ have been investigated by many workers [13-18]. Recently, a part of the present research work by the authors on the enhancement of ferroelectric properties of NaNO₂-PVA nano-composite films fabricated at moderate elevated temperature has been accepted for publication in which the equal wt% nano-composite has been reported of exhibiting optimum ferroelectric response [19]. In the present work, effect of annealing conditions on the ferroelectric response of NaNO₂: PVA composite films fabricated at elevated temperature is studied.

EXPERIMENTAL DETAIL

In the present study, the composite films of NaNO₂-PVA were prepared on circular brass disc substrates by maintaining them at 70°C temperature by 'drop drop cast' techniques. The precursor solution was prepared by taking 50: 50 weight percentage of each component in DDW which acts as a common solvent. At the time of pouring the solution on to the substrate, the solution as well as the substrate was brought at the elevated temperature fixed to be 70°C. Thereafter the solution was allowed to dry out for 3—4 hours at the same temperature. Subsequently the sample

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Sr. No. 6

Performance analysis of Gaussian approximation in wide band code division multiple access system over various fading channels

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Abstract: Third-generation based wideband code division multiple access (WCDMA) systems have been designed for providing multimedia services. But multipath fading and multi-access interference puts a limit on overall system performance. We thus need to analyse the modelling and behaviour of WCDMA system to evaluate system performance. Here, the behaviour of WCDMA system is analysed by Gaussian approximation in which interference and channel noise are generated by the approximations of mean and variance of interferer power. Different kind of fading distributions like Weibull, Rayleigh, Rician and Nakagami is applied to Gaussian approximated WCDMA system to generate faded signal. Simulated results are obtained with BER vs. Eb/no for

Sr. No. 7

Performance Evaluation of OWC Using Different Modulation Techniques

Heena Goyal, Jyoti Saxena and Sanjeev Dewra

Cite this   Citations ⟨ 3

Abstract

In this paper, performance of an optical wireless communication (OWC) channel has been investigated using different modulation techniques such as phase shift keying (PSK), differential PSK (DPSK) and optical quadrature PSK (OQPSK). This investigation has been compared at a bit rate of 20 Gbps. The results are evaluated in terms of quality (Q) factor and bit error rate (BER) using different modulation techniques. It is observed that by using PSK modulation technique, the signal can travel up to 70 km transmission distance with acceptable BER of 3.48×10^{-12} and Q factor of 6.93. It is also observed that by using DPSK and OQPSK, system covers transmission distance of 80 and 90 km with acceptable values of Q factor of 6.59, 6.02 and BER of 2.34×10^{-11}, 1.46×10^{-10}, respectively.

Sr. No. 8

Comparative investigations of DWDM transmission system with PMD for different orthogonally modulated signals at 80Gb/s

Richa Bhatia[1,*,†], Ajay Kumar Sharma[2] and Jyoti Saxena[3]

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SUMMARY

Polarization mode dispersion (PMD) has become one of the major limiting factors for high-bit-rate optical transmission systems. This paper evaluates the performance of dense wavelength division multiplexed (DWDM) system with PMD at 80 Gb/s in the presence of Kerr-nonlinear effects. Orthogonally modulated signals have been investigated and compared for tolerance against PMD in a DWDM transmission system with direct detection receivers. The optimized combinations of orthogonal polarization (OP) with carrier-suppressed return-to-zero (CSRZ) and CSRZ differential-phase-shift-keying signals are shown to improve PMD tolerance over high bit rates and long transmission lengths. Improved performance greater than 4 dB is observed for CSRZ modulated signal with OP because of less channel cross talk and reduced power transfer between adjacent bits over different PMD values. The numerical results demonstrate that our proposed orthogonally modulated signals perform better with lesser complex direct detection receivers. Copyright © 2015 John Wiley & Sons, Ltd.

Sr. No. 9

Original research article

Improved analysis of four wave mixing with sub-plank higher-order dispersion parameters in optical communication systems

CrossMark

Richa Bhatia [a,*], Ajay K Sharma [b], Jyoti Saxena [c]

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ABSTRACT

Four wave mixing (FWM) is one of the major limiting phenomena for wavelength division multiplexed optical communication systems. This paper analysis four wave mixing with sub-plank higher-order dispersion (HOD) parameters up to eighth-order in optical communication through single mode fiber. Four wave mixing power with combination of dispersion parameters up to eighth-order dispersion has been analysed and compared with the dominant second-order dispersion parameter for different channel powers, effective core areas and channel spacing. It has been observed that combined effect of dispersion parameters can bring down four wave mixing by 10–15 dB and facilitate improved inference of four-wave mixing performance with HOD parameters. Hence the results can provide a better direction in the choice of fiber parameters for efficient management of FWM in range of applications.

Sr. No. 10

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Critical analysis of frequency selective surfaces embedded composite microwave absorber for frequency range 2–8 GHz

Neeraj Gill[1,2,4] · Smitha Puthucheri[2] · Dharmendra Singh[1,2] · Vijaya Agarwala[1,3]

Abstract Radar wave absorbers are important for the reduction of radar cross section of the target for stealth applications. Earlier the radars were available in the frequency range 8–12 GHz (X-band) and 12–18 GHz (Ku-Band). Due to recent advancement in radar technology, radars are now available from 2 to 18 GHz frequency range. So there is an urgent need to develop such a material that can work as radar wave absorber in the lower frequency band of the microwave spectrum i.e., 2–8 GHz. For this purpose the selection of material is an important criterion as the radar wave absorption depends primarily upon the material characteristics i.e., complex permittivity and complex permeability. For lower frequency radar wave absorption, the material must also possess the conducting property along with dielectric and magnetic properties. narrow radar wave absorption bandwidth (4–7 GHz). So we have explored the possibility of the efficient use of an advanced electromagnetic technique like frequency selective surface to enhance the radar wave absorption bandwidth in the lower frequency region of the microwave frequency spectrum and precaution has been taken such that complexity due to FSS can be avoided. It has been observed that the synthesised single layer absorber with single square loop, cross dipole and Jerusalem cross FSSs provides radar wave absorption bandwidth in the frequency range 2–8 GHz.

1 Introduction

Sr. No. 11

Energy efficient duplication-based scheduling for precedence constrained tasks on heterogeneous computing cluster

Cite

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Abstract: Power optimization is emerging as one of the crucial performance parameter for High Performance Computing (HPC) platforms owing to their excessive energy consumption. Traditionally, judicious allocation of tasks to yield lower makespan was the major concern and duplication based strategies scored an edge over the list based scheduling techniques. However, the former gained its objectives at the cost of increased computational energy consumption. In this paper, an Energy Aware Duplication Scheduling algorithm (EADS) has been developed for scheduling a set of dependent tasks on Heterogeneous Cluster (HC) exploiting Dynamic Voltage and Frequency Scaling (DVFS) technique for tasks and their duplicates without affecting schedule length. The performance is analyzed on random and regular task graph suite, with wide parametric variations, in comparison to duplication and list based scheduling algorithms with and without DVFS. From the results gathered, it is indicated that there exists potential for saving energy in the duplication-based schedules, which EADS algorithm is able to exploit well. Unlike the available works, this paper analyzes the total system energy consumption, which accounts for computation energy (busy and idle states) and communication energy of the cluster interconnect.

Sr. No. 12

Analyzing block type channel estimation for OFDM based digital communication system

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Abstract. Orthogonal frequency division multiplexing (OFDM) is a promising technique in the current broadband wireless communication system due to the high data rate transmission capability and the ability to combat frequency selective fading of the channel. Channel estimation is mainly implemented by sending pilot symbols in the transmitted bit streams. In this paper, channel estimation based on block type pilot arrangements is analyzed using Least Square (LS) and Minimum Mean Square Error (MMSE) channel estimators. Performance is analyzed in terms of Bit Error Rate and Mean Square Error by varying pilot energy levels and by varying channel length. It is gathered that performance gets affected considerably with change in pilot energy levels implying there exist an optimum value for pilot energy for getting better performance.

1 Introduction

estimation based on block type pilot arrangements using LS and MMSE channel estimators is studied. This paper

Sr. No. 13

S.No 12

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Implementation of Fractal Geometry to Enhance the Bandwidth of CPW Fed Printed Monopole Antenna

Sushil Kakkar & Shweta Rani

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ISCHEMIA DETECTION IN ECG SIGNALS USING STATISTICAL ANALYSIS BASED APPROACH

Amit Kumar Manocha and Mandeep Singh

Abstract

A novel technique has been proposed for the detection of ischemia in ECG signals based on statistical features obtained from ST deviations in ECG signals. Wavelet transform has been used for preprocessing and ECG features delineation. Then mean thresholds for ST segment deviations are used to classify the ischemic beats from normal beats. The ischemia recognition from enduring ST segments is made through the coefficient of variation (COV), kurtosis and form factor. The algorithms are implemented in MATLAB 2012a and IBM SPSS 22 is used for statistical analysis. The results show average sensitivity (S_E) 98.76% and positive predictivity (+P) 98.51% for 82,357 ST segments of 40 arbitrarily chosen records of annotated European ST-T database (EDB) after validation. These results are significantly better than the available methods in the literature.

Sr. No. 15

APPLICATION OF ARTIFICIAL NEURAL NETWORKS FOR MAXIMUM REFLECTIVITY OF FIBER BRAGG GRATING

Parveen Bajaj, A. K. Goel and Harbhajan Singh

Abstract

In order to achieve maximum reflectivity of fiber Bragg grating (FBG), we simulate the behavior of FBG using application of feed-forward network of artificial neural network (ANN). In fiber optics communication, FBG is widely used in the field of optical fiber sensors and light wave communication based on the presence of photosensitivity in silicon fibers and optical waveguides. In previous studies, effect of modulation depth, grating length and change in refractive index have been studied. In this work, we include combination of various parameters like core radius, index difference, effective refractive index, grating length and index amplitude of grating and simulate using ANN. Minimized mean square error and linear regression have been achieved with different possible combinations of various parameters as input vectors to ANN. Studies show that ANN gives high performance results.

DEPARTMENT OF CIVIL ENGINEERING

Sr. No. 16

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This paper reports the potential of rice husk waste biomass to remove copper (II) from simulated wastewater under different experimental conditions. For this, rice husk has been pre?treated by boiling, formaldehyde and concentrated sulphuric acid. Fourier Transform Infrared Spectroscopy, Scanning Electron Microscopy and Energy dispersive analysis X?ray analyses were performed before and after adsorption, to explore number and position of the functional groups available for copper (II) binding on to studied adsorbents and changes in adsorbent surface morphology. Effect of various process parameters, namely, pH, adsorbent dose, initial copper (II) concentration and contact time has been studied in batch systems. The removal of copper (II) was dependent on the kind of pre?treatment, physico?chemical characteristics of the adsorbent, copper (II) concentration and other studied process parameters. The optimum pH was 5.0 for copper (II) ion removal. The experimental data were analyzed using Freundlich, Langmuir, Dubinin?Radushkevich (D?R) and Temkin isotherm models. It was found that Freundlich and Langmuir models fitted better and well. The results revealed that the copper (II) is considerably adsorbed on the prepared adsorbents and it could be an economical method for heavy metal sequestration from wastewaters. The process followed the pseudo?second order reaction kinetics. ? 2016, Gh. Asachi Technical University of Iasi. All rights reserved.

Sr. No. 17

Strength, Rapid Chloride Penetration and Microstructure Study of Cement Mortar Incorporating Micro and Nano Silica

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This paper presents the strength, rapid chloride penetration and microstructure study of cement mortar incorporating micro-silica (MS), nano-silica (NS) and micro-silica with optimized content of nano-silica (MS+NS) as a partial replacement of cement. The hardened properties of the mortar such as compressive strength and split tensile strength of all the specimens has been determined at the age of 28, 56, 90 and 180 days. Quadratic model and ANOVA analysis has been carried out to determine the

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ORIGINAL ARTICLE

Solution of non-convex economic load dispatch problem using Grey Wolf Optimizer

Vikram Kumar Kamboj[1] · S. K. Bath[2] · J. S. Dhillon[3]

Abstract Grey Wolf Optimizer (GWO) is a recently developed meta-heuristic search algorithm inspired by grey wolves (Canis lupus), which simulate the social stratum and hunting mechanism of grey wolves in nature and based on three main steps of hunting: searching for prey, encircling prey and attacking prey. This paper presents the application of GWO algorithm for the solution of non-convex and dynamic economic load dispatch problem (ELDP) of electric power system. The performance of GWO is tested for ELDP of small-, medium- and large-scale power systems, and the results are verified by a comparative study with lambda iteration method, Particle Swarm Optimization algorithm, Genetic Algorithm, Bio-geography-Based Optimization, Differential Evolution algorithm, pattern search algorithm, NN-EPSO, FEP, CEP, IFEP and MFEP. Comparative results show that the GWO

1 Introduction

In the recent power system networks, there are various generating resources like thermal, hydro, nuclear etc. Also, the load demand varies during a day and attains different peak values. Thus, it is required to decide which generating unit to turn on and at what time it is needed in the power system network and also the sequence in which the units must be shut down keeping in mind the cost-effectiveness of turning on and shutting down of respective units. The
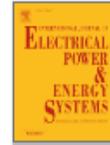
Sr. No. 19

Implementation of hybrid harmony search/random search algorithm for single area unit commitment problem

Vikram Kumar Kamboj [a], S.K. Bath [b], J.S. Dhillon [c]

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Abstract

Harmony Search (HS) is a population based metaheuristics search algorithm inspired from the musical process of searching for a perfect state of harmony and has ability to escape from local minima, does not require differential

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Research Article

A solution to energy and environmental problems of electric power system using hybrid harmony search-random search optimization algorithm

Vikram Kumar Kamboj ✉ & S.K. Bath | Kun Chen (Reviewing Editor)

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DEPARTMENT OF MECHANICAL ENGINEERING

Sr. No.21

Thermal characterization of recycled polymer for additive manufacturing applications

K.S. Boparai [a], R. Singh [b], F. Fabbrocino [c], F. Fraternali [d] 🗑 ✉

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Abstract

This work is focused on the thermal characterization of Nylon 6 based nano-composite (NC) material. Initially, melt flow index (MFI) test confirms the qualification of this material, as an alternative material for the fabrication of FDM filament. The differential scanning calorimeter (DSC) and thermogravimetric analysis (TGA) measurements characterize the material by

Sr. No. 22

Parametric optimization of fused deposition modeling and vapour smoothing processes for surface finishing of biomedical implant replicas

Jasgurpreet Singh Chohan [a] ✉, Rupinder Singh [b] 👤 ✉, Kamaljit Singh Boparai [c] ✉

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Abstract

This study focuses on formulation of robust design for vapour smoothing, an

Sr. No. 23

Technical Paper

Mathematical modelling of surface roughness for vapour processing of ABS parts fabricated with fused deposition modelling

Jasgurpreet Singh Chohan [a] ✉, Rupinder Singh [b] ✉, Kamaljit Singh Boparai [c] ✉

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Abstract

Fused deposition modelling (FDM) has number of applications in the field of metal casting but the poor surface finish acts as major obstruction against rapid investment casting of the replicas prepared by this process. The vapour

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