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Mathematics

ON THE SUPERSTABILITY OF LOBACEVSKI
EQUATION IN SEVERAL VARIABLES
Laura MANOLESCU

Abstract. In this paper, we study the superstability of the Lobacevski equation in several variables.

Keywords and phrases: Hyers-Ulam stability, Lobacevski equation, superstability

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POST-HOC TESTING AND RELIABILITY ASSESSMENT
IN MEDICAL EVALUATION SCALES.
A PHYSICIAN'S POINT OF VIEW

Dan Alexandru SURDUCAN, Diana LUNGEANU

Abstract. Evaluation scales are popular instruments in applied medical research, especially when seeking to capture patient's subjective experience or perception. This article presents a medical study initially focused on physiotherapy and physical rehabilitation issues re-examined with the aim of statistically analyzing two important underlying factors behind a medical decision: posthoc testing and reliability assessment. The paper reviews the Bonferroni correction, the preferred post-hoc approach in medical data analysis, and the Cronbach's coefficient alpha (Cronbach-alpha), a widely used tool in reliability assessment.

Keywords and phrases: medical biostatistics, Bonferroni correction, Cronbach-alpha, SF-36

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**A NEW APPROACH OF REFRACTION FOR 3D ELECTRIC
FIELD IN NONLINEAR DIELECTRICS WITH PERMANENT
POLARIZATION AND RANDOM ANISOTROPY**

**Part II. New forms of refraction theorems in dielectric with
permanent polarization**

Ioan BERE

Abstract. Using a new permittivity - defined by author (in Part I) for dielectrics with permanent polarization we will demonstrate new theorems of refraction (in Part II), more general, for three-dimensional (3D) electric field lines at the separation surface of two nonlinear and anisotropic materials with permanent polarization, which have random polarization main directions. Then (in Part three), some applications of the new refraction theorems are presented, for particular cases.

Keywords and phrases: a new permittivity, permanent polarization, random anisotropy, 3D refraction theorems

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**ANALYSIS OF ADVANTAGES
OF THE AMPLITUDE CHARACTERISTICS
OF SPECIAL GEGENBAUER LOW-PASS FILTERS**

Aleksandar D. ILIĆ, Vlastimir D. PAVLOVIĆ, Zlata Ž. CVETKOVIĆ

Abstract. In this paper, some of featured examples of attenuation and insertion loss in the bandwidth and around the stop-band cut-off frequency as the benefits of the new class of continual filter functions generated analytically by extremal Christoffel-Darboux formula for orthogonal Gegenbauer polynomials are shown. The explicit expression for the characteristic function of proposed special Gegenbauer low-pass filters has two parameters, the filter order n , and the real free parameter α , which provides a wide range of the amplitude responses applicable to the design of RC active filters in modern wireless communications.

Keywords and phrases: allocation of resources, fair/inuenced answer of the market, inuence of the consumers.

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OUTAGE PERFORMANCE OF WIRELESS SYSTEM IN THE PRESENCE OF RICIAN SHORT TERM FADING, GAMMA LONG TERM FADING AND NAKAGAMI-M INTERFERENCE

**Dragana KRSTIC, Ivica MARJANOVIC, Selena VASIC,
Vladeta MILENKOVIC, Mihajlo STEFANOVIC**

Abstract. In this paper, wireless mobile communication radio system in the presence of short term fading, long term fading and cochannel interference subjected to large scale fading and small scale fading is analysed and considered. Desired signal experiences Gamma long term fading and Rician short term fading and cochannel interference experiences Gamma long term fading and Nakagami-m short term fading. Proposed system operates in interference limited environment where signal to interference ratio (SIR) is important performance measure. Probability density function (PDF) and cumulative distribution function (CDF) of resulting signal to interference ratio is evaluated. By using cumulative distribution function, the outage probability of radio system can be calculated. The influence of Rician factor, Nakagami-m short term fading severity parameter and Gamma long term fading severity parameter on the outage performance is discussed.

Keywords and phrases: Cochannel interference, Gamma long term fading, Nakagami-m short term fading, outage probability, Rician short term fading

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PROBABILITY DENSITY FUNCTION OF THE DOUBLE NAKAGAMI-M CHANNEL SIGNAL TO INTERFERENCE RATIO IN THE PRESENCE OF RAYLEIGH INTERFERENCE

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Abstract. This paper considers the probability density function, a first order statistics measure, of the output signal to interference ratio for double Nakagamim mobile-to-mobile fading channel in the presence of Rayleigh interference. Due to obstacles there is no direct link between the source and destination mobile stations and they are communicating via a relay mobile station. The interference is present at both relay and destination mobile station, and it is assumed that the interference is much stronger than the noise, i.e. an interference-limited environment is considered. The closed form expression for the probability density function of the signal to noise ratio at the destination mobile station will be derived and the influence of the fading channel on the statistics will be considered.

Keywords and phrases: Cooperative communications, mobile-to-mobile channel, Nakagamim fading, Rayleigh fading, probability density function.

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MACHINE LEARNING APPLICATION IN PERMANENT MAGNET FORCE CALCULATION

**Ana STOJANOVIĆ, Dušan VUČKOVIĆ,
Milena STANKOVIĆ, Ana VUČKOVIĆ**

Abstract. This paper is meant to be proof of concept that permanent magnet force, usually calculated using method based on fictitious magnetic charges can be predicted using one of the machine learning approaches. This approach would reduce calculation time significantly, and this is what is intended to be shown.

Keywords and phrases: machine learning, magnetic force, permanent magnet.

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CAPACITANCE DETERMINATION OF CYLINDRICAL CONDUCTOR OF SQUARE CROSS SECTION PLACED IN GROOVE

**Milan D. VESKOVIĆ, Jeroslav M. ŽIVANIĆ,
Nenad N. CVETKOVIĆ, Zoran V. JEVREMOVIĆ**

Abstract. This paper presents an application of Charge Simulation Method for calculation of the capacitance per unit length, cylindrical conductor square cross section in the U - shaped groove. Convergence of the results for the normalized capacitance per unit length are shown. The results are presented in tabular and graphical form.

Keywords and phrases: Charge Simulation Method, Cylindrical Conductor, Groove.

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