Electronic Journal: Southwest Journal of Pure and Applied Mathematics
Internet: http://rattler.cameron.edu/swjpam.html
ISSN 1083-0464
Vol. No. 01, 1995, pp. 1–12.
Submitted: March 8, 1995. Published: June 20, 1995.

PERTURBED NEWTON-LIKE METHODS AND NONDIFFERENTIABLE OPERATOR EQUATIONS ON BANACH SPACES WITH A CONVERGENCE STRUCTURE

Ioannis K. Argyros

Abstract. In this study, we use perturbed Newton-like methods to find solutions of nonlinear, nondifferentiable operator equations on Banach spaces with a convergence structure. This technique involves the introduction of a generalized norm as an operator from a linear space into a partially ordered Banach space. In this way the metric properties of the examined problem can be analyzed more precisely. Moreover, this approach allows us to derive from the same theorem, on the one hand, semi-local results of Kantorovich-type, and on the other hand, global results based on monotonicity considerations. Furthermore, we show that special cases of our results reduce to the corresponding ones already in the literature. Finally, our results are used to solve integral equations that cannot be solved with existing methods.

(1991) A.M.S. (MOS) Subject Classification Codes. 65J15, 65B05, 47D15, 47H17, 49D15.

Key Words and Phrases. Banach space, perturbed Newton-like methods, nondifferentiable operator.

Department of Mathematics, Cameron University, Lawton, OK 73505, U.S.A.
E-mail Address: ioannisa@cua.cameron.edu

Electronic Journal: Southwest Journal of Pure and Applied Mathematics
Internet: http://rattler.cameron.edu
ISSN 1083-0464
Vol. No. 01, 1995, pp. 13–16.
Submitted: March 16, 1995. Published: June 30, 1995.

DIFFERENTIATED SHIFT-INVARIANT MULTIVARIATE INTEGRAL OPERATORS

George A. Anastassiou

Abstract. In a recent paper [1] the author, together with H. Gonska, introduced some wavelet-type, very general multivariate integral operators over $\mathbb{R}^d$, $d \geq 1$, and studied their various properties such as shift-invariance, global smoothness preservation and optimality, convergence to the unit, differentiation, and preservation of continuous multivariate probability distribution functions. These operators are introduced through a convolution-like iteration of another very general multivariate operator with a general multivariate scaling type function. In this paper the author gives sufficient conditions, so that the *partial derivatives of the above described multivariate operators* possess most of the above listed nice properties of their originals. In particular, a sufficient condition is given so that a corresponding "global smoothness preservation" sharp multivariate inequality is attained. The corresponding convergence of differentiated operators to the differentiated unit operator is given with rates of convergence.

(1991) A.M.S. (MOS) Subject Classification Codes. 60, 62, 28.

Key Words and Phrases. Wavelet integral operators, Probability distribution functions.

Department of Mathematics, Memphis State University, Memphis, TN
Email: anastasg@ kermes.msci.memst.edu

Electronic Journal: Southwest Journal of Pure and Applied Mathematics
Internet: http://rattler.cameron.edu/swjpam.html
ISSN 1083-0464
Vol. No. 01, 1995, pp. 17–26
Submitted: June 11, 1995. Published: September 5, 1995.

STOCHASTIC CALCULUS AND INITIAL VALUE ANALYSIS ON THE ONE DIMENSIONAL DIFFUSIONS

Dražen Pantić

Abstract. Stochastic calculus and initial value analysis are used for complete description of distribution type of diffusion processes with Lipschitz coefficients. Sufficient conditions so that the solutions of stochastic differential equations posses absolutely continuous one dimensional distribution are given. For stochastic differential equations with uniformly elliptic coefficients probability density is investigated in detail. Also, the distribution of inverse process is given.

(1991) A.M.S. Subject Classification Codes. 60H07, 60H10.

Key Words and Phrases. Malliavin calculus, solutions of stochastic differential equations, point distributions.

Department of Mathematics, University of Belgrade, Studentski trg 16, 11000 Beograd, Yugoslavia
E-mail Address: epantidr@ubbg.etf.bg.ac.yu

Electronic Journal: Southwest Journal of Pure and Applied Mathematics
Internet: http://rattler.cameron.edu/swjpam.html
ISSN 1083-0464
Vol. No. 01, 1995, pp. 27–29.
Submitted: July 19, 1995. Published: September 18, 1995.

A LOGICAL ALTERNATIVE TO THE EXISTING POSITIONAL NUMBER SYSTEM

Robert R. Forslund

Abstract. This article introduces an alternative positional number system. The advantages of this alternative system over the existing one are discussed, and an illustration of the use of the system to re-interpret apparent errors in ancient archaeological documents is presented.

(1991) A.M.S. (MOS) Subject Classification Codes. 11, 01.

Key Words and Phrases. positional number system, archaeology, zero, placeholder.

Ministry of Natural Resources Centre for Northern Forest Ecosystem Research c/o Lakehead University, 955 Oliver Road, Thunder Bay, Ontario, Canada P7B 5E1
E-mail Address: mjohnsto@sky.Lakehead.ca

Electronic Journal: Southwest Journal of Pure and Applied Mathematics
Internet: http://rattler.cameron.edu/swjpam.html
ISSN 1083-0464
Vol. No. 01, 1995, pp. 30-36.
Submitted: May 12, 1995. Published: October 16, 1995.

RESULTS ON CONTROLLING THE RESIDUALS OF PERTURBED NEWTON-LIKE METHODS ON BANACH SPACES WITH A CONVERGENCE STRUCTURE

Ioannis K. Argyros

Abstract. In this study, we provide sufficient conditions for controlling the residuals of perturbed Newton-like methods, in such a way that the convergence of such methods is ensured. In order to achieve this, we apply a theorem due to Kantorovich on a setting of a regular space with a convergence structure.

(1991) A.M.S. (MOS) Subject Classification Codes. 65J15, 65B05, 47D15, 47H17, 49D15.

Key Words and Phrases. Newton-like methods, residuals.

Department of Mathematics, Cameron University, Lawton, OK 73505, U.S.A.
E-mail Address: ioannisa@cua.cameron.edu

Electronic Journal: Southwest Journal of Pure and Applied Mathematics
Internet: http://rattler.cameron.edu/swjpam.html
ISSN 1083-0464
Vol. 1995, No. 1 pp. 37-45.
Submitted: June 8, 1995. Published: October 26, 1995.

A PROBABILISTIC APPROACH TO THE ESTIMATION OF THE DISTRIBUTION OF THE TARGET LOCATION POINT

M.A. Tabatabai

Abstract. A probabilistic approach is used to estimate the probability distribution of the target location point. The results can be used in missile-testing and target acquisition fire support model simulation. The target may be a mobile multiple launcher rocket, an antiaircraft gun or a ship in mid-ocean. In each case, there is a time lag between the detection of the target and the arrival of the projectile.

(1991) A.M.S. (MOS) Subject Classification Codes. 60, 62.

Key Words and Phrases. Probability density function, Gamma function.

Department of Mathematical Sciences, Cameron University, Lawton, OK 73505
E-mail Address: mohammad@tiger.cameron.edu