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A Study on the Relationship Between Direct Semantics and Continuation Semantics for Concurrency

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ABSTRACT: We consider an abstract concurrent language \mathcal{L} embodying a mechanism of asynchronous communication. We specify the behavior of programs in the style of Plotkin's structural operational semantics. We consider two different transition system specifications for \mathcal{L} . One is designed following the direct approach to concurrency semantics. The other one is designed with continuation semantics for concurrency (CSC). For the language \mathcal{L} , we investigate the relationship between direct semantics and CSC. We define a bisimulation relation between the two transition systems and we use some basic techniques of metric semantics to establish the formal relationship between the two semantic models.

KEY WORDS: Operational semantics, metric spaces, continuations for concurrency.

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A Voronovskaya Type Theorem for Some Generalized Bernstein Operators

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ABSTRACT: In this article we give a Voronovskaya type theorem for the operator $V_n : C[0, 1] \rightarrow C[0, 1]$, $n \geq 1$ given by $V_n f(x) = (B_n f)(u_n(x))$, $x \in [0, 1]$ where B_n is the Bernstein operator and $u_n : [0, 1] \rightarrow [0, 1]$, $n \geq 1$ are continuous functions.

KEY WORDS: Voronovskaya theorem, Bernstein operator

MSC 2000: 41A25, 41A36

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On Induction for Non-interior G -algebras and Puig's Induction for Interior G -algebras

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ABSTRACT: The aim of this note is to analyze Turull's induction for G -algebras. We prove an embedding of Turull's induction into Linckelmann's definition of Puig's induction for an interior algebra. A result regarding a correspondence of points is also proved.

KEY WORDS: interior algebra, G -algebra, induction

MSC 2000: 16E40, 20J06, 20C05

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Invariance of a Weighted Power Mean in the Class of Weighted Gini Means

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ABSTRACT: Given two means M and N , the mean P is called (M, N) -invariant if $P(M, N) = P$. At the same time the mean N is called complementary to M with respect to P . We use the method of series expansion of means to determine the complementary of a weighted power mean with respect to a weighted Gini mean. The invariance of a weighted power mean in the family of weighted Gini means is also studied.

KEY WORDS: weighted Gini mean, complementary mean, invariance in a class of means

MSC 2000: 26E60

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Sufficient Conditions for Starlikeness of Some Integral Operators

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ABSTRACT: In this paper some sufficient conditions for starlikeness of some integral operators for analytic functions f in the open unit disc U are presented.

KEY WORDS: Integral operator, starlike, complex numbers, univalence, analytic functions, the open unit disc.

MSC 2000: 30C45.

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Optimization Problems and Approximated Optimization Problems with Subgradients

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ABSTRACT: In this paper, a so-called approximated optimization problem with subgradients associated to an optimization problem is considered. The equivalence between the saddle points of the lagrangian of the approximated optimization problem with subgradients and optimal solutions of the original optimization problem is established.

KEY WORDS: saddle points, invex functions, subinvex functions, approximated optimization problems, subgradient

MSC 2000: 90C26, 90C30, 90C46

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An Integral Formula of Green's Type

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ABSTRACT: We prove an integral formula of Green's type and we apply this result in the proof of a generalization of Stokes' integral formula.

KEY WORDS: Green's theorem, Stokes' theorem

MSC 2000: 26B20

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Strong-stability-preserving, 6-stage, Hermite–Birkhoff Time-discretization Methods of Order 4 to 12

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ABSTRACT: New optimal, 6-stage, explicit, strong-stability-preserving (SSP), Hermite–Birkhoff (HB) methods of orders 4 to 12 with nonnegative coefficients are constructed by combining linear k -step methods with a 6-stage Runge–Kutta (RK) method of order 4. We extend the Shu–Osher form of RK methods [6] to HB methods and show how generalized optimal Shu–Osher forms can be constructed from the Butcher tableau of HB methods. Compared to Huang’s hybrid methods of the same order, the new methods generally have larger effective SSP coefficients and larger maximum effective CFL numbers, num_{eff} , on Burgers’ equation, independently of the number k of steps, especially when k is small for both methods. Based on num_{eff} , some new methods of order 4 and 5 compare favorably with other methods of the same order, including RK104 of Ketcheson and RK105 of Ruuth. The new SSP HB methods are listed in their Shu–Osher form in the appendix.

KEY WORDS: Strong stability preserving; Hermite–Birkhoff method; SSP coefficient; time discretization; method of lines; comparison with other SSP methods

MSC 2000: 65L06; 65M20

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Symmetries, projections and Yang-Baxter Equations

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ABSTRACT: Involutive operators related to symmetric spaces or certain symmetric structures appear in many areas of mathematics. In this paper we explain how algebra structures give rise to involutive operators with a special property. Thus, the celebrated Yang-Baxter equation enters the stage. We also give a short account on super-symmetry and its relationship with the Yang-Baxter equation.

KEY WORDS: symmetry; projection; (quantum) groups; Yang-Baxter equation; algebra structures; super-symmetry; symmetric Lie algebra

MSC 2000: 58D19; 16T25; 17B60; 17C90

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