POSTDOC
SEMINAR SERIES
> *BOOKLET*

26 MAR **28 MAR** **1 APR**

2024

Organized by KMUTT Fixed Point Theory And Application Research Group, Faculty of Science, King Mongkut's University of Technology Thonburi, Thailand

ABSTRACT

The Fixed-Point Research Laboratory of King Mongkut's University of Technology Thonburi usually organizes Postdoctoral Seminar Presentations among postdoctoral researchers each semester. The purpose of the seminars is to discuss research problems and ideas among graduate students and postdoctoral researchers of the Lab. In this regard, it is a great pleasure to present you with the details of the presentation scheduled for Semester 2 of 2023. The details comprise the title of each presentation, the name of the presenters, their emails, and the abstract of the talks. This program is designed to be held online and onsite within February 2024.

PRESENTATION SCHEDULE

March 26, 2024

1.00 - 2.00 PM **Dr. Talha Anwar**
Comprehensive Fractional Analysis of a Hybrid Nanofluid Subject to Multishaped Nanoparticles

March 28, 2024

1.00 - 2.00 PM **Dr. Jamilu Abubakar**
Iterative Method for Split Equilibrium Problem and Minimization Problem via Conjugate Gradient Method

April 2, 2024

1.00 - 2.00 PM **Dr. Yasir Arfat**
Some Variants of the Hybrid Extragradient Algorithm in Hilbert Spaces

2^{nd} **Semester, 2023**

Postdoc Seminar Series,
Fixed Point Theory and Applications Research Group, Center of Excellence in Theoretical and Computational Science (TaCS-CoE), Faculty of Science, King Mongkut's University of Technology Thonburi (KMUTT), Thailand

Comprehensive Fractional Analysis of a Hybrid Nanofluid Subject to Multishaped Nanoparticles

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Abstract

The aim of this research is to determine the impact of incorporating tantalum and nickel nanoparticles in mineral oil on thermal characteristics and flow patterns, with the objective of predicting possible improvements. The dependence of the role of both nanoparticles on their shapes is evaluated for column, platelet, lamina, cylinder, and tetrahedron-type shapes. This work analyzes the thermal performance of two different nanofluids individually made of tantalum and nickel nanoparticles while also examining the synergistic effects produced due to the simultaneous suspension of these particles. The basic mathematical model is formulated subject to free convection, time-dependent flow and heat conditions, and thermal radiation. This governing system is made non-dimensional to lessen the intricacy and provide the basis for the utilization of fractional operators. In order to assess the effectiveness of fractional modeling techniques, constant proportional Caputo (CPC) and Atangana-Baleanu (ABC) derivatives are operated for the model generalization. The Laplace transform is served as a solution procuring technique, and series and integral form exact solutions are extracted for CPC and ABC derivative-based models, respectively. To interpret modifications in thermal and velocity patterns arising from diverse physical phenomena, numerous graphical depictions of exact solutions are communicated.

Keywords: Hybrid nanofluid; Shape factors; Heat transfer; Exact solutions

References

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2^{nd} **Semester, 2023**

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Iterative Method for Split Equilibrium Problem and Minimization Problem via Conjugate Gradient Method

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In this work, we devise an accelerated iterative method for solving the common solution of split equilibrium problems and minimization problems. The idea is to construct an iterative scheme with fast convergence properties by blending the conjugate gradient direction with an averaging technique. Furthermore, the proposed method does not require prior knowledge of the operator norm of the bounded linear operator involved for implementation. Instead, the stepsizes are self adaptively updated. Under some standard conditions, we show that the sequence generated by the proposed algorithm converges weakly to the common solution of the considered problem. Numerical illustrations indicate that the proposed algorithm is easy to implement and computationally efficient.

Keywords: Equilibrium problem; Conjugate gradient; Lipschitz-type conditions; Convex sets; Averaged mappings

References

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2^{nd} Semester, 2023

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Some Variants of the Hybrid Extragradient Algorithm in Hilbert Spaces

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Abstract:
This paper provides convergence analysis of some variants of the hybrid extragradient algorithm (HEA) in Hilbert spaces. We employ the HEA to compute the common solution of the equilibrium problem and split fixed-point problem associated with the finite families of k-demicontractive mappings. We also incorporate appropriate numerical results concerning the viability of the proposed variants with respect to various real-world applications.

Keywords: Hybrid extragradient algorithm; Equilibrium problem; Fixed-point problem; Strong convergence

References

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