

“Fractional Calculus and Its Applications”

The Fractional Calculus comprises a fractional-order differentiation and integration which consists in the generalisation of well-known classical integer-order differentiation and n -fold integration to real or even complex orders. Calculus based on the fractional-order difference and sum is developed intensively parallel to the fractional-order differentiation and integration. That is caused by the fractional-order derivative and integral practical evaluations. Although there has not yet been a persuasive graphical interpretation of the fractional (non-integer) differentiation and integration and still several definitions of the fractional derivative/integral coexist, the Fractional Calculus demonstrates growing applicability in numerous scientific disciplines ranging from electrical engineering to electronics, electrochemistry, thermal engineering, mechanics, automatic control and robotics, signal and image processing to biology physics and economy.

This Special Issue contains selected papers presented at the First Polish Workshop devoted to the Fractional Calculus and its applications held at the Institute of Control of the Technical University of Łódź in June 2009. The content of the papers shows a wide range of research areas related to the Fractional Calculus.

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Piotr Ostalczyk
Institute of Automatics
Technical University of Łódź