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Clocking Convergence of Discrete Nonlinear Maps (Including Fractional Maps)

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Discrete nonlinear maps have been extensively studied for more than five decades since the introduction of the logistic map as one of the first examples of a deterministic system exhibiting chaotic behavior. Algorithms for clocking the asymptotic and non-asymptotic convergence of non-invertible and completely invertible maps will be discussed in this talk. A computational technique based on the visualization of the algebraic complexity of transient processes will be employed for that purpose. Temporary stabilization of unstable orbits in non-invertible maps will be demonstrated and discussed. We will show that the dynamics of the fractional difference logistic map is similar to the behavior of the extended invertible logistic map in the neighborhood of unstable orbits. This counter-intuitive result will provide a new insight into the transient processes of fractional nonlinear maps.

Experience:

Professor Minvydas Ragulskis is the principal investigator and the founder of the Center for Nonlinear Systems at Kaunas University of Technology, Lithuania. Prof. Ragulskis is the Fellow of Lithuanian National Academy of Sciences. Prof. Ragulskis has been serving as the invited expert, invited rapporteur and invited monitoring expert at Research Executive Agency, European Commission, Brussels. Prof. Ragulskis is a member of the Science and Technology Panel at the Research Foundation Flanders (FWO), Brussels. He is also the member of the Scientific Advisory Board at the HeartMath Institute (Boulder Creek, California, USA). Prof. Ragulskis is the recipient of several International awards including Zigmantas Zemaitis medal awarded by Lithuanian Mathematical Society.