Functional Analysis, Mathematical Physics, and Dynamical Systems
(FAMPDS)
Joint American-Ukrainian Virtual Colloquium Series
Spring 2021

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Talk 4: *The Algebra and Geometry of Twin-Point Designs in Optimal Design of Computer Experiments*

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Abstract

We continue our introduction to optimal clustered designs in statistical design of computer experiments. (1) New experimental evidence: The emergence of a hierarchy of clustered designs, such as pairs of twin-point designs. (2) New theory: A theorem stating the integrated-mean-squared-prediction-error objective function is a low-degree-truncated, rational, generalized function; the connection of this "Nuclass" of function with total positivity and of total positivity with the Riemann hypothesis; and a theorem stating that the assumption of invariance of the algebra of twins, over their design domain, leads to curvature of the domain. (3) Speculated applications, beyond design of experiments: Superconductivity, topologically protected states of matter, biological regeneration, and anti-senescence.

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Friday, March 26, 10:00-11:00 AM (PDT), 19:00-20:00 (EET)

Online via Zoom at
https://fresnostate.zoom.us/j/5233106532