



MESA (Mechatronics, Embedded Systems and Automation) Lab
Presents
A Research Seminar at The
Applied Fractional Calculus (AFC) Workshop Series

Date/Time/Place: 05/05/2014, 4-6PM, MESA Lab (Room 820), 4225 N. Hospital Rd., Atwater, CA 95301. T: 209-2284398

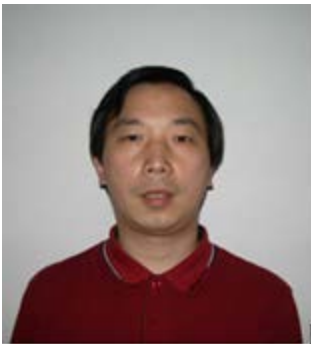
Title: Fractional Calculus in sea clutter

Abstract: Fractional calculus play an important role in alpha distribution signal process. In this presentation, examples of real radar sea clutter data are considered, compare to integral MUSIC algorithm Fractional method are employed to estimate the DOA of radar. At last simulations results fractional MUSIC for sea clutter works and discussions are given.

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Speaker's short biography (with photo): xiaodong sun, was born in 1975. He received the BS and MS degrees from the Automation school, Jilin University, Jilin, China, in 1999 and 2004, and the PhD degree in control engineering from Jilin University in 2009. He is an associate professor in School of communication, Jilin university. He now is a visiting scholar in MESA (Mechatronics, Embedded Systems and Automation) Lab, UC Merced.

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Key reference(s) (if any):

[1] Daifeng Zha, Tianshuang Qiu. Direction finding in non-Gaussian impulsive noise environments, Digital Signal Processing 17 (2007) 451-465



Integer-Order Calculus



Fractional-Order Calculus

Fractional Order Mechanics!

Hooke's law: $F = kx$
Newton's fluid: $F = kx'$
Newton's 2nd law: $F = kx''$

$F(t) = kx^{(\alpha)}(t)$

Going in-between: interpolation of operators:

$\dots, \frac{d^{-2}f}{dt^{-2}}, \frac{d^{-1}f}{dt^{-1}}, f, \frac{df}{dt}, \frac{d^2f}{dt^2}, \dots$