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Computational Mathematics Seminar Series

Serendipity Finite Element Methods in Theory and Practice**Andrew Gillette, The University of Arizona**

Assistant Professor

Digital Media Center 1034
November 13, 2018 - 03:30 pm**Abstract:**

Serendipity finite element methods present a promising computational advantage over traditional tensor product finite elements: a significant reduction in degrees of freedom without sacrificing the order of accuracy in the computed solution. The theory of serendipity methods dates back to the 1970s but has seen a resurgence of interest in recent years within the context of finite element exterior calculus and the Periodic Table of the Finite Elements. In this talk, I will review modern perspectives on the family of serendipity elements and present the accompanying family of "trimmed serendipity" elements from my recent work. On the practical side, I will also discuss developments on the construction of basis functions for serendipity-type elements and their use on non-affinely mapped mesh element geometries. This is joint work with Tyler Kloefkorn and Victoria Sanders.

Speaker's Bio:

Andrew Gillette is an assistant professor in Mathematics at the University of Arizona. He received his Ph.D. in mathematics from the University of Texas at Austin and spent two years as a postdoc at UC San Diego. His research expertise centers around generalized and efficient finite element methodologies and was supported by an NSF grant entitled "Enhancing the Periodic Table of Finite Elements." His application areas of interest include cardiac electrophysiology, anomalous diffusion, and gravitational wave phenomena.

This lecture has refreshments @ 03:00 pm