

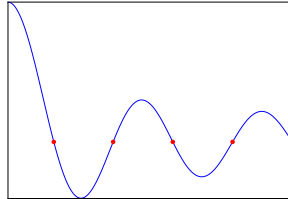
Student Research Talks (StReeTs)

Mason Experimental Geometry Lab (MEGL)

Root finding with Chebyshev Polynomials: Background and Applications in 2-D

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Abstract

Root finding is a common problem in numerical analysis and is useful in many applications. Our specific application is an inverse problem in thermodynamics. We want to find all temperatures and pressures at which a fluid attains two desired properties. This problem can be formulated as a two-dimensional root finding problem where there may be many solutions. Existing work by Townsend (2014) provides a method, which utilizes Chebyshev polynomials, to tackle this problem. Our work involves an implementation of this method tailored to our application. In general, this method only works for rectangular domains, and current work involves extending the algorithm to more general domains. This talk will include background on root finding methods using Chebyshev polynomials, background on our application, details of Townsend's method, details of our implementation, and a discussion of current work.

Date: Friday, February 2, 2018

Time: 2:30pm–3:20pm

Place: Exploratory Hall 4106

Pizza and soda will be served at the presentation.

For further information or for special accommodations, please contact Sean Lawton via email at seanlawton@gmail.com or drop by the MEGL.