

This invitation is extended to all Staff and HDR Students

RESEARCH SEMINAR

Centre for Informatics and Applied Optimisation

Speaker: Dr James Saunderson,
Monash University

Date: Thursday 19 October 2017,
@ 10.00am

Room: T121, T Building, Mt Helen
OR via Visimeet:



Title: “Hyperbolic polynomials and semidefinite programming”

Abstract:

Hyperbolic polynomials are multivariate homogeneous polynomials with certain real-rootedness properties, such as the determinant restricted to symmetric matrices. First identified in the context of PDEs, they now play a role in numerous areas, including theoretical computer science, probability theory, and optimisation. Associated with any hyperbolic polynomial is a convex ‘hyperbolicity’ cone. The resulting conic optimisation problems are called hyperbolic programs.

On the one hand, linear, second-order cone, and semidefinite programming are all special cases of hyperbolic programming. On the other hand, it is conjectured that any hyperbolic program can be reformulated as a semidefinite program (of possibly much larger size). In this talk I will introduce this circle of ideas and questions, before presenting (polynomial-size) semidefinite descriptions of hyperbolicity cones associated with directional derivatives of determinants.

Biography:

James is currently a lecturer in the Electrical and Computer Systems Engineering Department at Monash University.

James received the Bachelor of Engineering and Bachelor of Science degrees (both with Honours) from the University of Melbourne in 2008. He then completed MS and PhD degrees in Electrical Engineering and Computer Science at Massachusetts Institute of Technology (MIT) in 2011 and 2015 respectively. Before joining Monash, he spent a year as a Postdoctoral scholar jointly in Electrical Engineering at Caltech and the University of Washington.

Research area include Convex Optimization, Semidefinite Programming, Signal Processing, Machine Learning.

The seminar is available to staff and students at other FedUni campuses via the Visimeet system from their desk tops. If you would like to join the seminar please contact Evan Dekker, e.dekker@federation.edu.au who will organise an invitation to join the seminar.