Topology, Arithmetic, & Dynamics Seminar

Geometry and Connectivity of Space of Finite Unit-Norm Tight Frames

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Finite unit-norm tight frames (FUNTFs) are redundant linear dictionaries that are useful in the compression and robust transmission of signals. In this talk we introduce various characterizations of spaces of FUNTFs, including the eigensteps (or Gelfand-Tsetlin patterns) constructions which provide convenient local parameterizations of these FUNTF varieties. We show how these parameterizations may be used to demonstrate that FUNTF varieties are connected, which verifies a conjecture first appearing in Dykema and Strawn (2006). After introducing this connectivity result, we show how it may be refined to demonstrate that the set of nonsingular points on these spaces is also connected, which can be in turn used to show that spaces of FUNTFs are irreducible in the algebro-geometric sense. One Corollary of this result is that a generic FUNTF has full spark, and is therefore useful in various compressed sensing applications. This joint work with Jameson Cahill and Dustin Mixon.

Date: **Friday, October 30th, 2015**
Time: **2:30-3:30pm**
Place: **4106 Exploratory Hall**

For special accommodations, please contact Sean Lawton via email at `slawton3@gmu.edu`.