

Taut Strings and Real Interpolation

Eric Setterqvist

Department of Mathematics, Linköping University, Sweden

The notion of taut string was introduced by Dantzig in connection with problems in optimal control. Basically, the taut string problem is about finding a function with minimal graph length, a *taut string*, in between two given continuous piecewise linear functions F and G with $F \leq G$. Taut strings have since then appeared in a broad range of applications including statistics, economics and image processing. As it turns out, the taut string has besides minimal graph length also minimal energy and minimal total variation among the functions in between F and G .

In this talk, we introduce the notion of invariant K -minimal sets which is based on the K -functional of real interpolation (of operators). We will show that invariant K -minimal sets provide a framework for generalizing taut strings to multidimensional and continuous settings. Based on this framework, we consider new applications of classical and generalized taut strings to communication theory and network flows.