Golden Ratio Nets and Sequences

Nathan Kirk
University of Waterloo
n2kirk@uwaterloo.ca

Coauthor(s): Christiane Lemieux and Jaspar Wiart

The subject of this talk are digital nets and sequences constructed from an irrational base, focusing on the case of a base given by the golden ratio φ. A complete framework to study equidistribution properties of nets in base φ is given and used to define and prove the properties of $(0,1)$-sequence and $(0,m,2)$-net in base φ for the one-dimensional van der Corput sequence in base φ and two-dimensional Hammersley point sets in base φ, respectively. An improvement in distribution properties over traditional integer based digital constructions is shown via the discrepancy, and we detail how the equidistribution notions that are introduced for base φ can be generalized to other irrational bases.