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# Seminar

## *Geodesic Equation on the Universal Teichmuller Space, Teichons and Imaging*

*Dr. Sergey Kushnarev*

*Singapore University of Technology and Design*

### Abstract

In this talk I will describe a way to parametrize a space of planar shapes by members of a coset space  $PSL_2(R) \setminus Diff(S')$ . These functions are known as fingerprints of the shape, or welding maps in the Teichmuller theory. Imposing Weil-Petersson metric on this shape space endows it with wonderful mathematical properties: unique geodesics between any two shapes. The geodesic equation on this space is the Euler-Poincare equation on the group of diffeomorphisms of the circle  $S'$  or  $EPDiff(S')$ . It admits a class of soliton-like solutions, Teichons. The resulting simpler geodesic equation is more tractable from the numerical point of view. Applications of image matching with Teichons on the database of hippocampi will be demonstrated.

**Date :** ~~August 23, 2017 (Wednesday)~~  
**Time :** 10:00a.m. – 11:00a.m.  
**Venue :** Room 222, Lady Shaw Building  
The Chinese University of Hong Kong

August 25, 2017  
(Friday)

*All are Welcome*