# DK Seminar

**June 3, 2015, 14:00 - 15:30**
**University of Vienna**
**Oskar-Morgenstern-Platz 1, WPI, 8th floor, Seminarroom.**


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## Efficient matching of implicit shell surfaces through a lower semicontinuous energy

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**In collaboration with: Martin Rumpf (Uni. Bonn)**


Numerically finding a deformation matching two embedded surfaces is an important problem in application areas like computer graphics and the emerging field computational anatomy. Taking inspiration in modern theories of nonlinear elasticity, we present a variational model for matching surfaces represented by their signed distance functions.

This level set framework and the use of explicit dependence on the deformed configuration enables us to pose a lower semicontinuous functional that contains only first order derivatives of the deformation, but retains geometric invariance and still represents all the expected phenomena, like resistance to compression and bending. Accordingly, one can prove existence of minimizing deformations with both Dirichlet and Neumann boundary conditions.

The model is discretized through an adaptive finite element formulation, whose minimization is approached through a cascadic multilevel scheme. Finally, some numerical examples obtained from real data are presented.