Teacher: Dr. Maria Charina, University of Vienna, Austria
Course title: "Joint spectral radius and optimization for subdivision"

Teaching period: 21.01.2015 – 30.01.2015

Teaching hours: 24
(Lectures: 18 hours; Practical exercises and seminar talks: 6 hours)

Abstract:
This course is devoted to the study of subdivision - a modern branch of approximation theory with applications in biological imaging, computer animation, geometric modelling and isogeometric analysis.

Subdivision schemes will be defined as local recursive algorithms for generation of curves and surfaces. The important tools for the analysis of the properties of such algorithms are certain algebraic and optimization techniques. In particular, the study of convergence and regularity of subdivision curves and surfaces relies, on the one hand, on the concept of joint spectral radius - the generalization of the spectral radius of a square matrix. On the other hand, linear and convex optimization are used not only for convergence and regularity analysis of subdivision schemes, but also allow for constructions of such schemes that are more sensitive to the geometry of the generated object.

The course consists of a series of lectures, practical exercises and seminar talks. The goal is not only to learn the underlying mathematical methods, but also to get experience in the development and implemention of subdivision schemes.

Detailed Schedule:

Me 21.01.2015 ore 10.15-12.30 (Dip. di Matematica e Applicazioni - AULA 3014)
Gi 22.01.2015 ore 10.15-12.30 (Dip. di Matematica e Applicazioni - AULA 3014)
Ve 23.01.2015 ore 10.15-12.30 (Dip. di Matematica e Applicazioni - LAB531)

Lu 26.01.2015 ore 10.15-12.30 (Dip. di Matematica e Applicazioni - LAB531)
Ma 27.01.2015 ore 10.15-12.30 (Dip. di Matematica e Applicazioni - LAB531)
Me 28.01.2015 ore 10.15-12.30 (Dip. di Matematica e Applicazioni - LAB531)
Gi 29.01.2015 ore 10.15-12.30 (Dip. di Matematica e Applicazioni - LAB531)
Ve 30.01.2015 ore 10.15-12.30 (Dip. di Matematica e Applicazioni - LAB531)