DOCTORAL (PHD) STUDIES

COURSE UNIT DESCRIPTION

Course unit title	Scientific areas	Faculty	Institute, department
Computer-aided modeling of curves and surfaces	Informatics (N 009)	Faculty of Mathematics and Informatics	Institute of applied mathematics Department of differential equations

Study method	Number of credits	Study method	Number of credits
Lectures	2 (spring semester)	Consultations	2
Individual works	3	Seminars	

Summary

The basic principles of computer-aided geometric design (CAGD) are presented for the curves -- most simple and easy understandable case. Then is demonstrated how these principles work in considerably more complicated modeling of surfaces.

Outline:

-Bezier curves, Bernstein polynomials
-Approximating C^1 and C^2 splines
-Subdivision curves
-Interpolating Catmull-Rom splines
-Cubic C^2 splines
-Tensor-product surfaces
-Triangular surface patches
-Rational Bezier curves and surfaces

The practical tasks - implementation of presented algorithms - are only for the curves; programming language - choice of a student.

Main literature

Farin, G. (2014). Curves and surfaces for computer-aided geometric design: a practical guide. Elsevier.

K. Karčiauskas (2005). Kompiuterinė geometrija (https://klevas.mif.vu.lt/~kkk/kompgeo05.pdf), lithuanian

Joseph D. Warren, Henrik Weimer (2002). Subdivision Methods for Geometric Design. Morgan Kaufmann Publishers.

Lecturer(s) (name, surname)	Science degree	Main publications
Kęstutis Karčiauskas	dr.	http://www.elaba.mb.vu.lt/mif/?aut=Kęstutis+Karčiauskas
Rimvydas Krasauskas	dr.	http://www.elaba.mb.vu.lt/mif/?aut=Rimvydas+Krasauskas
Severinas Zubė	dr.	http://www.elaba.mb.vu.lt/mif/?aut=Severinas+Zubė