



SIGGRAPH 1992

**19th International Conference
On Computer Graphics and
Interactive Techniques**

**McCormick Place, Chicago
July 26 - 31**

COURSE NOTES

15

**CURVE AND SURFACE
DESIGN: FROM GEOMETRY
TO APPLICATIONS**

Organizer

**Alyn P. Rockwood
Arizona State University**

Lecturers

**Hans Hagen
Universität Kaiserslautern**

**Gregory M. Nielson
Arizona State University**

**Thomas A. Foley
Arizona State University**

Abstract

This course presents geometric foundations for curve and surface design, including: Bézier curves and curve interpolation, B-spline and NURBS curves, blossoming, geometric continuity, tensor product surfaces, Coons and Gordon surfaces, Bézier triangles, trimmed NURBS surfaces and surface interrogation. The presentation will rely on intuitive geometric concepts, with applications to practical design problems. Live interactive demonstrations will be given.

Lecturer Biographies

Thomas A. Foley is an Associate Professor in the Computer Science Department at Arizona State University. His teaching, research and publishing are in the areas of computer aided geometric design, multivariate data fitting, computer geophics and scientific visualization. He has been a faculty member of Cal. Poly. San Luis Obispo and the University of Nevada, Las Vegas, and he has done research at Lawrence Livermore National Laboratory for several years. Tom received his Ph. D from Arizona State University.

Hans J. Hagen is a professor of computer science at the Universität Kaiserslautern. His primary areas of teaching are in computer aided geometric design and computer graphics with reasearch in surface interrogation techniques and the fairing of curves and surfaces. He received his Ph.D from the Universität Dortmund.

Gregory M. Nielson is a professor of computer science at Arizona State University where he teaches and does research in the areas of computer graphics, computer aided geometric design and scientific visualization. He has published and lectured widely on curve and surface design and scattered data fitting. He is on the editorial board of a variety of CAGD, computer graphics and scientific visualization journals and he currently chairs the IEEE Computer Society Technic al Committee on Computer Graphics. He received his Ph. D from the University of Utah.

Alyn P. Rockwood is an associate professor in the Department of Computer Science at Arizona State University; his interests include volume rendering, blending surfaces, and computer-aided sculpturing. Previously, at Silcon Graphics, he helped develop the real-time display of NURBS for the IRIS workstation. At Evans & Sutherland, he supervised graphics software for the first Phase II flight simulator and helped develop the first general blending capability in the geometric modeler ROMULUS II. Alyn received his Ph. D from Cambridge University

Schedule

1. Bézier curves (with demo)	Gregory M. Nielson	30 mins.
2. B-spline curves (with video)	Hans J. Hagen	40 mins.
3. NURBS curves	Hans J. Hagen	20 mins.
4. Curve interpolation (with demo)	Thomas A. Foley	30 mins.
5. The blossoming approach	Alyn P. Rockwood	30 mins.
6. Geometric continuity	Gregory M. Nielson	30mins.
7. Tensor product surfaces	Thomas A. Foley	30mins.
8. Trimmed NURBS surfaces and demo	Alyn P. Rockwood	30mins.
9. Coons patches and Gordon surfaces	Gregory M. Nielson	30mins.
10. Triangular Bézier patches	Thomas A. Foley	30mins.
11. Surface interrogations and applications	Hans J. Hagen	30mins
12. Future research and development	Alyn P. Rockwood	30mins

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