

# SIGGRAPH '99 Course

## Practical Generation of Models from Acquired Data

### **Course Presenters (additional information follows)**

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Dr. Ken Martin (organizer and speaker) – Kitware Inc.  
Dr. Brian Curless – University of Washington  
Mr. Bill Lorensen – GE Corporate R&D  
Dr. Will Schroeder – Kitware Inc.

### **Course Syllabus**

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- 1) **Models from structured volumetric data (50 Minutes - Lorensen)**
  - Isosurface extraction
  - Volume segmentation and labeling
  - medical and industrial CT / MR / Physical slices)
  - Probing physical slices to obtain color (texture)
  - Volumetric smoothing
  
- 2) **Model generation from range Images (50 Minutes – Curless)**
  - structured light rangefinding
  - polygonal stitching of datasets
  - volumetric approaches
  
- 3) **Model Generation from unorganized points (50 Minutes – Schroeder)**
  - Delauney2D
  - Delauney3D
  - Alpha shapes
  - gaussian splatting (elliptical splatting)
  
- 4) **Post processing to Improve the results (50 Minutes – Martin)**
  - Polygonal mesh decimation
  - Polygonal surface smoothing
  - Triangle strip generation
  - Connectivity (for noise removal)
  - Normal generation

### **Course Abstract**

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This course will present a detailed discussion of how to create polygonal models from acquired data. Such models are used in a wide variety of fields including animation, architecture, illustration, engineering, and medicine. Models based on acquired data tend to be accurate, realistic, and rich in content. Common sources of acquired data include Computed Tomography, Magnetic Resonance Imaging, Physical Slices, Range Cameras, Laser Scanners, 3DOF probes, structured light, and Coordinate Measuring Machines. This course will present the techniques used to create polygonal models from these data sources, show examples of the results and discuss how to optimize the results.