

## **Class Description**

For many years appearance models in computer graphics focused on general models for reflectance functions coupled with texture maps. Recently it has been recognized that even very common materials such as hair, skin, fabric, and rusting metal require more sophisticated models to appear realistic. We will begin by briefly reviewing basic reflectance models and the use of texture maps. We then describe common themes in advanced material models that include combining the effects of layers, groups of particles and/or fibers. We will survey the detailed models necessary needed to model materials such as (but not limited to) skin (including pigmentation, pores, subsurface scattering), plants (including internal structure) and automotive paints (including color flop and sparkle). We will then treat the modeling of complex appearance due to aging and weathering processes. A general taxonomy of effects will be presented, as well as methods to simulate and to capture these effects.

## **Prerequisites**

Knowledge of basic rendering and reflectance functions.

## **Syllabus/Approximate Schedule**

- Introduction: 15 min.
- Background: 40 min.
- Specialized Material Models:
  - Common Themes: 20 min
  - Natural Materials: 35 min.
  - Manufactured/Processed Materials: 30 min.
- Aging and Weathering Processes:
  - Taxonomy: 10 min.
  - Simulation: 40 min.
  - Capture Approaches: 15 min.
- Future Trends and Resources 20 min.