

# Haptic Rendering of Textures

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## Overview

This half-day Sunday afternoon tutorial will overview the problem of haptic texture rendering and then carefully explain a new set of methods the presenters have developed for creating highly realistic haptic virtual textures. While some of the discussion will be relevant to bare-finger haptic interactions, we will focus on situations where the user touches the surface through a rigid tool. Interestingly, even though the skin is not in contact with the surface, humans can perceive many properties of a texture by dragging a rigid tool across it. Such interactions frequently arise in the areas of art, design, manufacturing, and medicine, as well as in everyday tasks such as writing a grocery list.

## Agenda

- 1:30 – 1:40    Introductions
- 1:40 – 1:55    Activity 1: Passive and active interaction with textures using a tool and the fingertip (KJK)
- 1:55 – 2:10    Perception of Textures (HC)
- 2:10 – 2:20    Background on Texture Rendering (KJK)
- 2:20 – 2:30    Data-Driven Modeling (KJK)
- 2:30 – 2:45    Activity 2: Passive tool-mediated interaction with textures moving slow/fast and pressing hard/soft (KJK)
- 2:45 – 3:00    Recording Hardware and Demo 1: Haptic Camera (HC)
  
- 3:00 – 3:30    Coffee Break: Demos will be available during this time
  
- 3:30 – 3:40    Friction Modeling (HC)
- 3:40 – 3:55    Texture Modeling (HC)
- 3:55 – 4:05    Texture Signal Generation (KJK)
- 4:05 – 4:25    Rendering Hardware and Demo 2: TexturePad (KJK)
- 4:25 – 4:40    Perception of Virtual Textures (HC)
- 4:40 – 5:00    Penn Haptic Texture Toolkit and Demo 3: Toolkit Textures on Omni (HC)  
[http://repository.upenn.edu/meam\\_papers/299/](http://repository.upenn.edu/meam_papers/299/)

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