

Surface Topography, Friction and Feel – CODIRECT Perception Delivery



Summary

The overall aim is to interconnect human tactile perception of various materials with the physical properties of their surfaces. In this project focus lies on the production of model surfaces and characterization of physical properties of the model surfaces as well as “real materials”. Psychophysical measurements on the same surfaces are performed by our collaborators who are psychologists. In the end, relationships between physical properties and perceived perception will be postulated.

Background

It is not yet established which physical properties on surfaces that determine tactile feel. However, it seems that (visco)elastic properties of the material, topography (surface roughness), adhesion and friction are likely to be important.

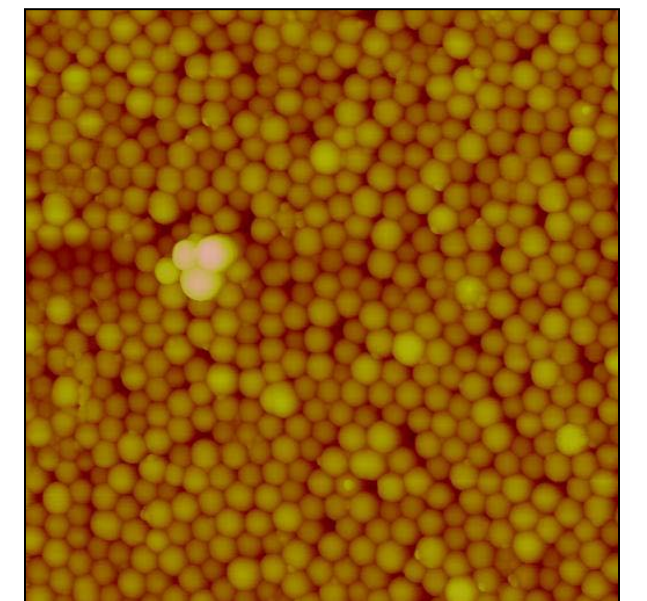
Main Techniques



Figure 1: A) An Atomic Force Microscope (AFM), used for imaging and friction measurements on model surfaces B) Profilometer, used for measuring topography and surface roughness C) Langmuir-Blodgett, used for deposition of silica particles to produce model surfaces D) A macroscopic friction device, used to measure friction between a human finger and different surfaces.

Results

In order to produce model surfaces with controlled roughness, silica particles of different sizes are deposited on glass substrates.



Friction between a human finger and 21 different coated and uncoated printing papers has successfully been measured with a device consisting of a piezoelectric force sensor. The smoother coated papers, have higher friction than uncoated papers. Both roughness and surface chemistry are implicated in the friction mechanism. All papers show a decrease in friction on repeated stroking with the finger. This decrease seems to be caused by both mechanical and chemical effects.

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