I started with a couple of papers that attempt to separate out different contributions to passive compliance of the human index finger:


Then I briefly showed some results for how stiffness, mass, and damping of the finger scale with applied force:


The higher level questions, though, center around how we actively modulate compliance, e.g., through co-contraction. This paper gives a great overview of research results related to such questions:


Many of the cited results have to do with arm motion – reaching, tracking, etc. There have also been quite a few results looking at grasp stiffness, going back to the same research team whose stiffness analysis techniques were discussed by Reuben on Monday:

All of the research results we discussed make use of techniques to either measure passive force while manipulating pose or measuring displacement when applying a disturbance force.

It is interesting to think about how stiffness might be measured in performance of natural tasks. This paper from the graphics community attempts to do just this. Take a look at both the paper and their video:

http://www.cs.rutgers.edu/mcl/ic/siggraph06.html