



McGill Computational Science and Engineering Seminar



2:30 pm, Friday, March 4, 2005 McConnell Engineering Bldg. Rm. 13

Human Movement Computation: from science to cinema.

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Human movement is very complex. It involves interaction with an uncertain physical world, using coordinated neural control of a large number of muscles. Computational models of movement could lead to fundamental advances in neuroscience and medicine, and inform the design of better robots and human interfaces. Models are also essential in the entertaining, but equally challenging, area of computer animation in games and cinema. I will first give an overview of this area and then describe two problems in more detail.

(1) Musculoskeletal simulation based on fiber-like solid elements we call "muscle strands." The strand model offers the efficiency of line-based muscle models, but with more realistic handling of contact and other constraints. I will describe the underlying model and numerical issues. (with Sueda and Wei).

(2) Interaction Capture. Traditional motion capture techniques fail to adequately model contact with a physical environment. We have developed new systems for simultaneously measuring contact forces and movement at a high rate --- a technique we call "interaction capture." I will describe results on using interaction capture for computer animation. (with Kry and Yin).



Coffee and snacks will be served in Room 603 after the seminar.