



Department of  
Mechanical Engineering  
The University of Hong Kong



## SEMINAR

### **A cloth simulator with improved bending models**

**Date:** 28 April, 2023 (Friday)

**Time:** 10:00 a.m.

**Venue:** Room 7-34, Haking Wong Building, HKU

**Speaker:** Mr. Qixin LIANG (PhD candidate)  
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#### **Abstract:**

Efficient, accurate and robust physical simulation algorithms are key factors in improving the performance of physical-based cloth simulation. Fabrics are generally modelled as thin shells and bending deformations are crucial for the aesthetic features in fabrics. Using the small-strain small-curvature assumption in the rotation-free triangle formulated under the corotational framework, different curvature operators are introduced and compared. Moreover, the implementation of boundary conditions in the rotation-free triangle is improved. Meanwhile, hinge stiffness coefficients in hinge-based bending models, which have been widely used in the computer graphics community, are reviewed and the most rational choice is identified. Simplified gradient and hessian of the hinge are also devised. Numerical examples to be presented indicate that the rotation-free model is more accurate, robust and efficient than the hinge-based bending model. Although both the rotation-free and hinge-based bending models can be easily incorporated into well-known cloth simulation engines such as Arcsim and C-IPC, a cloth simulator which includes various membrane constitutive models, verlet time explicit integrator, an optimization-based Newton-type implicit dynamic solver has worked out.

ALL INTERESTED ARE WELCOME

For further information, please contact Prof. K.Y. Sze at 3917 2637.