

## A PROTOTYPE VIRTUAL DRAPING SYSTEM

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### ABSTRACT

The purpose of this study is to virtualize draping processes and to improve those efficiency. For this purpose, a virtual draping system with which paper patterns can be made is developed using Virtual Reality Technique.

Cloth, hand and dress form are modeled to virtualize draping processes. Cloth is modeled as mass-spring model to calculate the shape mechanically. Hand model is reproduced as real hand, and nodes are arranged at each joint of fingers of the model. The hand model is moved according to the motion of the real hand and fingers. The movement of real fingers is detected by a sensor (Leap Motion), and it is applied to each joint of hand model. Dress form model is made from the measured data of a real dress form. Between virtual models, collisions are detected to prevent penetration between models.

The cloth model is geometrically mapped on the surface of the dress form model, and after that, relaxed shape of the cloth model is mechanically calculated. To adjust the position and the size of darts by hand model, the cloth model at darts part is made to be bulged shape. The function to automatically detect the part of dart is installed in the system. Planar shape of paper pattern can be obtained by mapping the three-dimensional points to the two-dimensional coordinates to form a dart. In the screen of virtual reality, the shape of the paper patterns can be checked in real time.

Real paper patterns of a pencil skirt were made with this system. In the future study, the operability to adjust the shape of darts and the shape of paper patterns made in this system should be improved.

It was succeeded to realize the series of processes of draping in the virtual space. But, many improvements are still needed for a practical system.