

عنوان مقاله:

Non-linear simulation of drying of plain knitted fabric using mass-spring-damper model and genetic algorithm optimization

محل انتشار:

مجله بین المللی طراحی پیشرفته و تکنولوژی ساخت, دوره 7, شماره 4 (سال: 1393)

تعداد صفحات اصل مقاله: 10

نویسندگان:

Vajiha Mozafary

Pedram Payvandy - Academic Staff at Yazd University

Mohammad Jalili

خلاصه مقاله:

In this study, the longitudinal shrinkage behavior of knitted fabrics during drying has been studied. In this context, a model is presented to predict the longitudinal shrinkage of plain knitted fabric during drying process. In order to model the shrinkage behavior, a 1DOF model consists of a mass, a linear spring and a linear damper have been used. In presented model the time-varying mass is considered due to fabric drying process. Nonlinear Equation of motion derived from the model have been solved using Three-order Straight Forward Expansion method. The results of the model were compared with the experimental results for five samples with different courses densities. The results shown that in high courses densities the presented model is capable enough to predict the longitudinal shrinkage of plain knitted fabric mass center during drying process. Error rate is ۱۱.۳ percent for the samples with high density. But with decrease in density, the error rate increases to ۱۸ percent. Then the genetic algorithm is used to optimize the model. Using optimized model the simulated error rate fell into ۵.۷ percent for samples with high density and the rate .fell to ۶.۱ percent with decrease in density

کلمات کلیدی:

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1198226>

