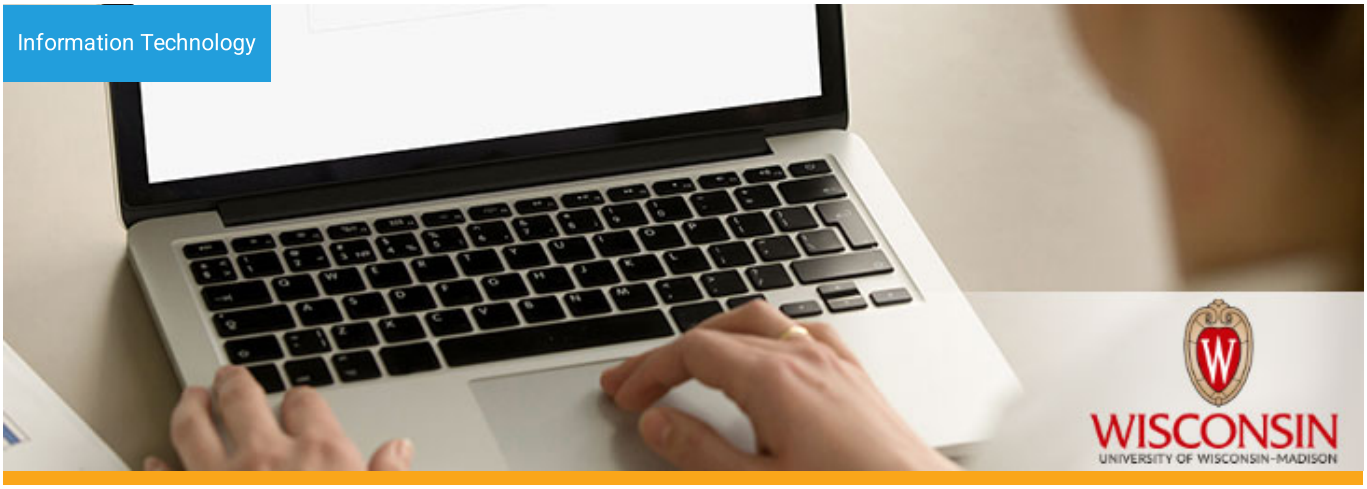
Information Technology



Generalized Non-Uniform Rational B-Spline (NURBS) Framework for Improved Graphics and Analysis

View U.S. Patent No. 10,102,671 in PDF format.

WARF: P170071US01

Inventors: Krishnan Suresh, Alireza Taheri

The Invention

Systems and methods for generating approximations and other representations of data in a data set include a generalized non-uniform rational B-splines (NURBS) framework that facilitates optimized computer-generated representations having high accuracy and requiring less computing resources than previous frameworks capable of achieving similar accuracy. The framework includes a set of rational basis functions that define a mesh parametrization of the data set; these rational basis functions are based on the typical NURBS rational basis functions, but decoupled to provide discrete weights in each direction of a parametrized space. The value of each decoupled weight can be individually altered to improve the accuracy of the representation in the corresponding direction without altering the underlying mesh parametrization. The accuracy and efficiency of the proposed methods, particularly for data sets including discontinuities or localized gradients, is demonstrated through numerical experiments.

Applications

- Computer aided design (CAD)
- Material modeling
- Reverse engineering
- Manufacturing
- Isogeometric analysis
- Bioengineering

Additional Information

For More Information About the Inventors

- Krishnan Suresh

Tech Fields

- Information Technology : Computing methods, software & machine learning

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842

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