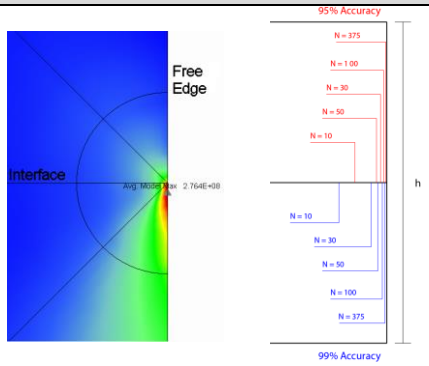
UNIVERSITY of LIMERICK
OLLSCOIL LUIMNIGH

Licensing Opportunity: Stress and Similar Analysis on Computing Devices

Overview



Researchers at the University of Limerick have developed a method which for the first time removes the constraints imposed by computing device precision in matrix algebra.

Finite element analysis (FEA) is a technique used for numerical analysis with application to stress analysis of structures in a wide range of fields including analysis of structural aircraft components and the study of thermal stresses in semiconductor devices. Many engineering structures are often composed of layers of differing materials. When modelled in FEA such structures can exhibit a stress singularity—an area in which the stress is often indeterminate. However, the effect of stress singularities cannot be predicted accurately in FEA.

A method of producing analyses of the distributions of these stress singularities, or any other property of interest, in which the accuracy of the property values is high and determinate is desirable. The methods currently in use are of limited and uncertain accuracy because some representations of property values which they generate are either of limited or of indeterminate accuracy.

Technology

The intellectual property developed by the researchers at the University of Limerick provides a method and system for analysing the physical properties of an object using a computing device, to any desired accuracy and spatial resolution with a degree of certainty and no longer restricted by the floating point limitations of the computing device. The system and method of the invention employs a method of scaling which uses differing scales for individual rows of arrays, and by further using differing scales for individual columns of the arrays. This method allows for the removal of errors in the calculation of property values so that the accuracy of the resultant physical property distribution may be known with a degree of certainty and no longer restricted by the floating point limitations of the computing device.

Typical applications lie in stress analysis and similar numerical representations which require solutions to equations that exceed the range of common computing standards, for example, limited by quadruple precision computing.

The method allows the analysis to be performed to:

- any accuracy (difference between true values and calculated values);
- any resolution;

and uniquely to

- a 100% confidence that both accuracy and resolution are truly satisfied simultaneously.

This method has been proven in the area of stress analysis of mechanical systems, but can be applied to any application requiring the manipulation of extreme values in matrix arrangement.

Commercial Opportunity

The University of Limerick is interested in seeking partners to exploit the commercial potential of these technologies by entering into licensing and collaboration agreements that mutually benefit both parties.

IP Status

A patent application has been filed, application number US 13/333,003.

Contact

Conor Morris
Technical Transfer Office
University of Limerick
Limerick, Ireland
+353-(0)61-234842 / e: conor.morris@ul.ie