A PERIDYNAMIC PERSPECTIVE ON SPRING-MASS FRACTURE

presented by

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Abstract:
The modeling of shapes that fracture is a particularly challenging area for computer graphics simulation, typically involving computationally expensive techniques based on classical continuum mechanics. Recently, a new theory of fracture, called peridynamics, has been introduced, and it offers a numerical method that is particularly suited for efficient solutions on the GPU. Peridynamics is of growing interest to the scientific community, but it has not yet been leveraged by computer graphics, in part because of difficulties in creating realistic renderings of the objects that fracture. This talk will discuss our implementation of the peridynamic formulation in CUDA as well as experimentation of fracturing objects performed on NVIDIA Tesla K20s. Furthermore, we describe an embarrassingly parallel technique for rendering the resulting particle systems. This project is joint work with Christopher Corsi, Jerry Tessendorf, and Robert Geist of Clemson University, and Adam Bargteil of University of Utah.

Bio:
Joshua A. Levine is an assistant professor in the Visual Computing division of the School of Computing at Clemson University. He received his PhD from The Ohio State University after completing his BS and MS in Computer Science from Case Western Reserve University. His research interests include geometric modeling, scientific visualization, mesh generation, topological analysis, vector fields, volume and medical imaging, surface reconstruction, computer graphics, and computational geometry.