

Abstract Submitted
for the TSF17 Meeting of
The American Physical Society

Accelerating Undergraduate Research with GPU Computing

CHRIS CURRY, BRYAN HOLLINGSWORTH, WESTON KIMBRO, BOBBY GARZA, LEIKA OTERO, Southwestern University — Simple iterative equations known as mappings have been studied as models of plasma and fluid systems, particle accelerators, and the transition to chaos in dynamical systems. Maps contain rich behavior characteristic of more complicated systems and are much faster to compute than the full dynamics, but challenges exist in computing and visualizing many initial conditions in parallel. The latest advances in graphics processing unit (GPU) computing (CUDA, OpenCL) have made massively parallel processing tasks readily available and accelerated machine learning, physics simulations, and data science. GPUs are also well suited to Virtual Reality (VR) applications. Here we present some recent results using GPUs and iterative mappings for VR explorations, biological neural networks, and cryptography.

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Date submitted: 28 Sep 2017

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