

# SAIP2014



Contribution ID : 84

## **A GPU Based Polyhedral Particle DEM Transport Code**

Thursday 10 Jul 2014 at 11:10 (00h20')

### **Abstract :**

Discrete Element (DEM) simulations are useful in a number of engineering disciplines such as mining, agriculture, etc. However the computational cost of discrete methods limits the number and detail of particles that can be simulated in a reasonable time frame without the use of a dedicated CPU cluster. This paper introduces a novel DEM based particle simulation code (BLAZE-DEM) that is capable of simulating millions of particles on a desktop computer utilizing a NVIDIA Kepler Graphical Processor Unit (GPU) via the CUDA programming model. BLAZE-DEM is 4 times faster than any other published code and capable of simulating over 50 million polyhedral particles compared to just 256 thousand by other codes.

### **Award :**

Yes

### **Level :**

PhD

### **Supervisor :**

Daniel Nico Wilke, University of Pretoria, nico.wilke@up.ac.za

### **Paper :**

Yes

**Primary authors :** Mr. GOVENDER, Nicolin (CSIR, University of Johannesburg)

**Co-authors :** Prof. KOK, Schalk (University of Pretoria) ; Dr. WILKE, Daniel (University of Pretoria)

**Presenter :** Mr. GOVENDER, Nicolin (CSIR, University of Johannesburg)

**Session classification :** Theoretical

**Track classification :** Track G - Theoretical and Computational Physics

**Type :** Oral Presentation