

**2022 Granular Materials Committee
Student Competition Winner**

DAWA SEO

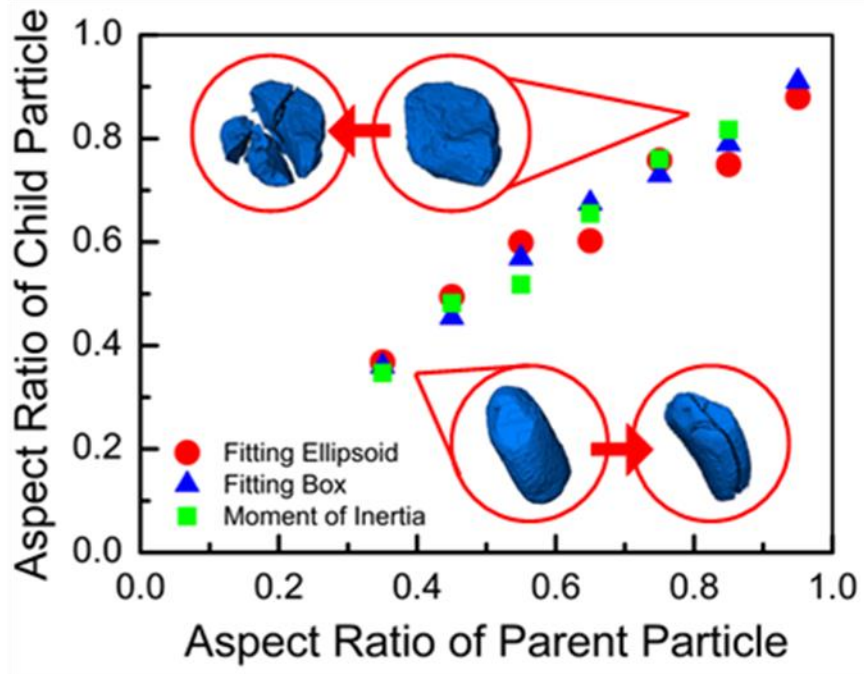
Northwestern University, Evanston, IL, USA



Title: *“Experimental analysis of shape distribution of fragments under particle breakage with 3D X-ray tomography”*

Statement from judges:

“The author developed a new experimental approach for identifying the evolution of particle shape during confined compaction. The author first performed oedometric compression experiments on granular materials with in-situ 3D x-ray tomography measurements. The x-ray tomography measurements, made at varying stress levels during oedometric compression, provided 3D images of grains. A custom 3D particle tracking algorithm was developed to identify the particle breakage process and assign particle fragments to their parent grains. Through this process, the author was able to track particles across generations of comminution and show that particles inherit features of their parent particles after breakage events: particle fracture tends to preserve the shape of original particles. The author concludes that multiple populations of particles may coexist in a final particle assembly, from intact particles to crushed fragments. The author is commended for a clear and concise presentation and for developing a new method for quantifying the evolution of particle size and shape during confined compaction.”



Shape heritability

