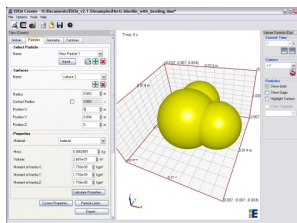




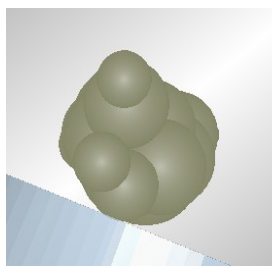
ASG for EDEM

The **Automatic Sphere-clump Generator** is a software tool that generates an approximate shape model of a particle using spherical elements that is suitable for Discrete Element Method simulation.



EDEM Creator supports the modelling of real particle shapes using spherical elements. Using the mesh of a particle (e.g. STL or equivalent), the

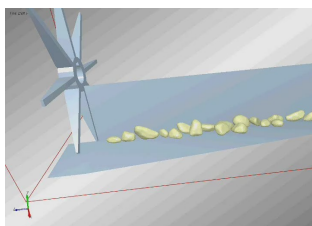
ASG software automatically performs this task in a much shorter time while also providing greater fitting accuracy than could be achieved by hand.



Why use sphere-clumps?

Representing particles as spheres enables fast, efficient contact detection during simulation at the expense of shape accuracy. In cases where particle geometry is an important factor, sphere-clumps can be used to produce more realistic simulation because the mass distribution of the particles can be more accurately modelled. This is typically useful for processes involving the handling of individual particles, or in systems where the particle density is low.

Example: Particles generated using **ASG** are used in a simulation of a single-particle ejection feeder system by De Beers. Since the shape of the particles significantly



affects the velocity of the system, the use of sphere-clump models offers more accurate simulation than using single spheres and enables better feedback for optimisation.

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Related technology

The **ASG** software was developed to work in conjunction with a 3D particle capture system when processing large batches of particles. We have worked closely with DebTech (a division of De Beers) to develop automated imaging systems capable of capturing particles of different size fractions. The systems are based upon the shape-from-silhouette concept and offer automatic recirculation for larger particles which produces refined shape models.

Macro: 1 - 10mm

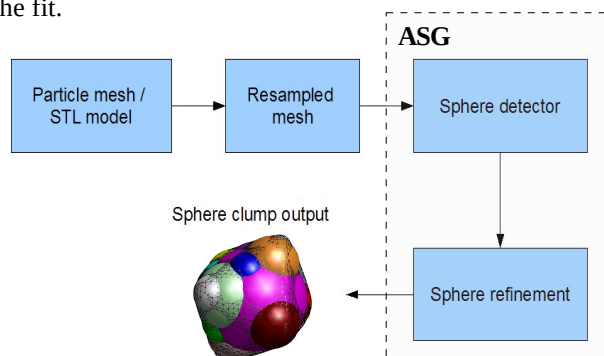


Micro: 75µm - 1mm



Current software

The algorithm consists of a two-step process: a randomised sphere-detection method creates an initial sphere-clump, and a non-linear optimiser is used to refine the fit.



ASG is currently implemented in C++ and is available as a set of Matlab functions. An output XML file is produced which can be read by **EDEM**. Customised implementation for other interfaces is available upon request. (No specific hardware is required.)

More information

Cogency is a software consulting firm that specialises in the development of customised algorithms for machine vision and related fields. For more information regarding the **ASG** software or other projects please view our website www.cogency.co.za or contact us.

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