Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Sorting Category: 03.1.10 (E)

Experimental analysis on how grain properties affect the performance of jammed granular systems for variable stiffness robotic applications[1] NADIA CHENG, KARL IAGNEMMA, ANETTE HOSOI, KATY GERO, Massachusetts Institute of Technology — Jamming of granular media has become increasingly utilized as a variable stiffness mechanism for industrial and robotic applications. The goal of our work is to better understand how grain properties affect jamming so that granular systems can be designed to fulfill the requirements of a given application. We have primarily focused on experimental studies to analyze how certain grain properties—such as shape, surface roughness, size distribution, and shape distribution—affect the performance of granular systems. Potential applications that utilize jamming would typically require that a contained granular system transition between effective solid states (e.g., when particular shape or strength needs to be maintained) and effective liquid states (e.g., when the system needs to be compliant such that it can be shaped or actuated by its environment). Therefore, we are interested in quantifying 1) the strength of compacted granular systems in their effective solid states and 2) the "ease of flow" and compliance of granular systems in their effective liquid states.

[1]The work presented here is supported by the DARPA M3 program

[X] Prefer Oral Session
[ ] Prefer Poster Session

Nadia Cheng
ncheng@mit.edu
Massachusetts Institute of Technology

Date submitted: 22 Feb 2012 Electronic form version 1.4