

Pesky particles pacified in pixels

Antoinette Tordesillas & David M Walker
Department of Mathematics & Statistics
University of Melbourne
Australia

In collaboration with
Edward Andò & Cino Viggiani
Laboratoire 3SR
Université Joseph Fourier
France









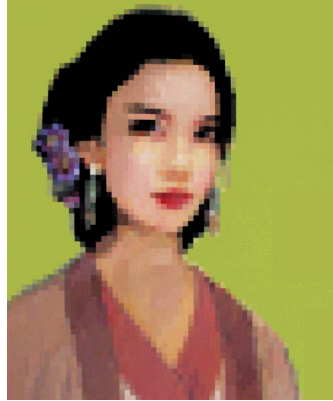


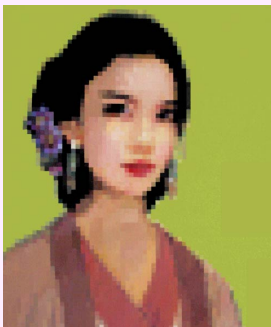




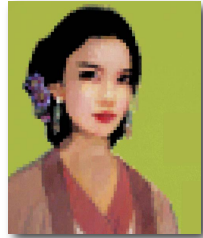




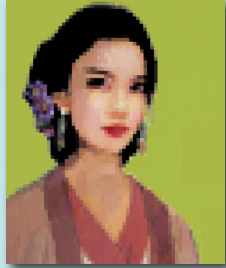




ZHONG CHEN



A study of length scales ...



Pixel

Image/Canvas

What do you want to see?

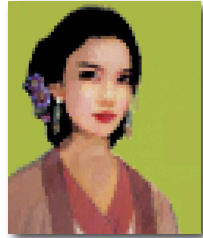


Representative Volume
Element, "RVE"

Material domain

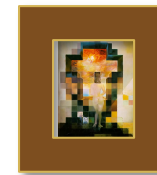
What do you want to see?

*.. details are smeared across pixels, the length scale of which sets the resolution of study... **AND** ...*



“The size and function of the pixels used are carefully determined relative to the canvas size and relative to the viewer's position in space.”

Zhong Chen



Gala contemplating the Mediterranean sea which at 20 meters becomes a portrait of Abraham Lincoln.

Salvador DALÍ

.. what we see in one scale may be different in another!



OBJECTIVE of this Lecture:
Show for Grenoble sample
(Hostun sand), 'How to find,
Where/What are' the relevant
length scales
Data from Viggiani & Andò

Plan of the rest of this talk ..

- ❑ **What Mechanics (CM, DEM, SM) tells us about length scales of observed patterns in granular materials**
 - ❑ Pattern recognition from Complex Systems Theory and what patterns teach us about the nature of complex systems
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- ❑ Extraction of length scales from Grenoble data on Hostun sand
- ❑ Results from extraction
- ❑ Inception of Hostun sand and the null hypothesis to test length scales are robust, meaningful and **real**
- ❑ Results from inception
- ❑ Lessons learned and where to next ...