

What is Texture?

Rhian Davies

May 9, 2014

The logo for the Engineering and Physical Sciences Research Council (EPSRC). It features the acronym "EPSRC" in a bold, purple, sans-serif font. The letters are framed by two horizontal teal lines, one above and one below.

Engineering and Physical Sciences
Research Council

The logo for STOR-i. The word "STOR-i" is in a large, black, sans-serif font. The letter "O" is stylized with a red dot in the center. The letter "i" is a solid red lowercase letter. Below the main text, the phrase "excellence with impact" is written in a smaller, grey, sans-serif font.











What is texture?

texture

Line breaks: tex|ture

Pronunciation: /ˈtɛkstʃə ɹ/

NOUN

[MASS NOUN]

- 1 The feel, appearance, or consistency of a surface or a substance:

‘skin texture and tone’

‘the cheese is firm in texture’

[COUNT NOUN]: *‘the different colours and textures of bark’*

MORE EXAMPLE SENTENCES

SYNONYMS

- 1.1 The character or appearance of a textile fabric as determined by the arrangement and thickness of its threads:

‘a dark shirt of rough texture’

MORE EXAMPLE SENTENCES

- 1.2 **Art** The tactile quality of the surface of a work of art.

MORE EXAMPLE SENTENCES

- 1.3 The quality created by the combination of the different elements in a work of music or literature:

Haralick's Thoughts on Visual Texture

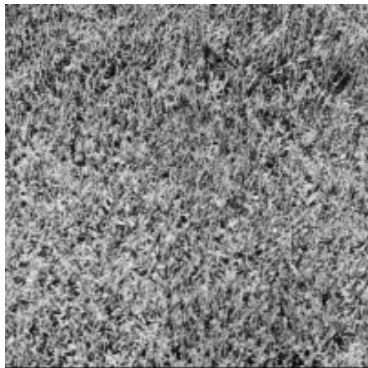
An innate property of all virtually all surfaces. It contains important information about the structural arrangement of surfaces and their relationship to the surrounding environment.

Texture can be considered an organised area phenomena. When it is decomposable it has two basic dimensions. The first dimension is for describing primitives out of which the image is composed and the second dimension is for the description of the spatial dependence or interaction between the primitives of an image texture.

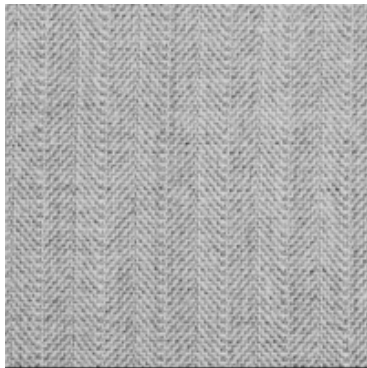


Primitive?

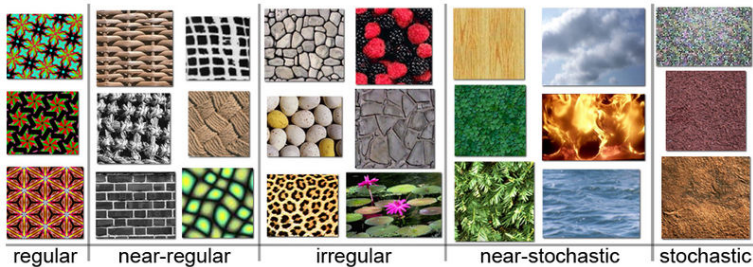
- ▶ Collection of pixels which form a basic element of a textured image
- ▶ Scale dependency is required for texture description.

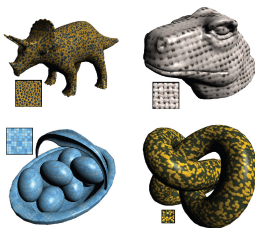
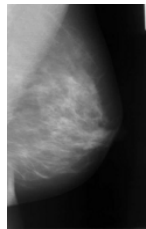


(a) Grass



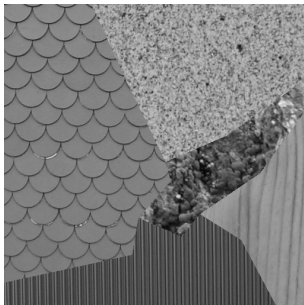
(b) Herringbone





Texture Segmentation

- ▶ Challenge: Partition image into disjoint regions of a coherent texture.
- ▶ We don't know...
- ▶ What types of textures exist in an image
- ▶ How many different textures there are
- ▶ Approach is to generate texture features to describe and then cluster.



Texture Feature Extraction

- ▶ Auto correlation Function
$$\frac{\frac{1}{(N_i - |x|)(N_j - |y|)} \sum_i \sum_j I(i,j)I(i+x,j+y)}{\frac{1}{N_i N_j} \sum_{i=1}^{N_i} \sum_{j=1}^{N_j} I(i,j)^2}$$
- ▶ Co-occurrence Matrix
- ▶ Wavelet Transform

