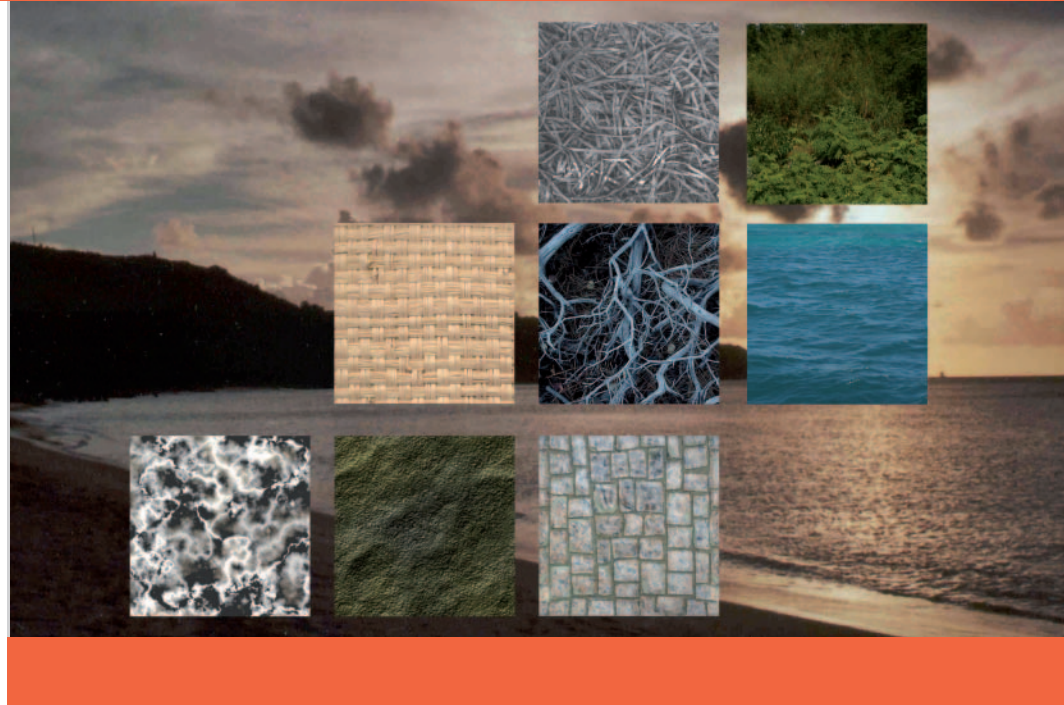


SYNTAX

We all know that stepping carelessly onto a wet marble floor might cause us to slip. The same way we know that running on grass in the park is safe; even if we fall we're unlikely to get hurt. Although we may not be aware of it, texture provides us with information that triggers certain emotional qualities and expectations. Knowing how to measure and control these would result in an untapped source of information. One creative team of researchers dared to ask what this source might actually look like.



Texture is a part of our daily life – it's in nature and the designs all around us. It provides us with clues about the safety of our surroundings or the strength and quality of certain objects. We are able to recognise the texture of an object's surface simply by looking at it. This makes texture a significant part of the sensory input that we receive each day.

And it evokes emotional responses within us, just as a particular score of music might. Much of the research conducted in the past has focussed on the relationship of emotions to music, smell, colour and taste. We have since learned to use these to achieve certain effects, such as employing particular colours for therapeutic aims or tailored sound design for the use in cars.

Surprisingly, however, little research has ever been conducted on the emotional qualities and expectations associated with specific textures. In fact, SYNTAX is the only project

to have ever attempted to measure, model and predict the psychological effects induced by texture.

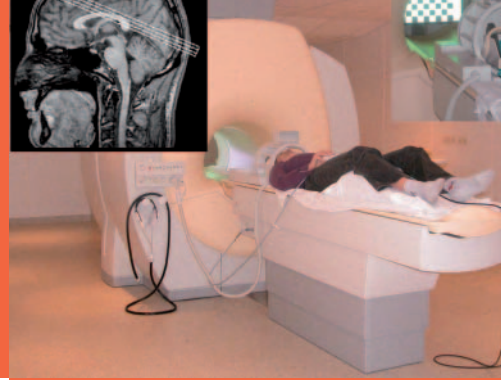
Its proposed outcome will open the gates to a new tool at the disposal of any adventurous mind. Applying the information could, for example, alter the design of surfaces on and in buildings, consumer products and even the interfaces of software and web pages in the virtual world.

Beyond the surface

The ability to understand and, ultimately, control the sensory inputs we receive through texture requires the collaboration, headed by Austria's Profactor GmbH, of a diverse group. The SYNTAX consortium, headed by Austria's Profactor GmbH, is represented by experts within the fields of psychology, neurophysiology, mathematics, machine vision and product design.



“If design is one way Europe distinguishes itself from its competitors, SYNTAX offers a technique in which to maintain its edge.”



AT A GLANCE

Official Title

Measuring Feelings and Expectations Associated with Texture

Coordinator

Profactor GmbH (Austria)

Partners

- Rijksuniversiteit Groningen (The Netherlands)
- University of Leeds (United Kingdom)
- Fundación Prointec (Spain)
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€ 2 416 643

EU funding

€ 1.8M

Project reference

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Visual and haptic textures are all around us. They influence our feelings, expectations and emotions.

Functional magnetic resonance imaging is used to create a cognitive model of texture processing.

Since texture is used in different contexts, the consortium has confined the definition of texture to: visual, the colour pattern that we see when we look at a surface; and haptic, the 3-dimensional surface topography we recognise when we touch a surface.

The project is structured around three cycles of psychological and neurophysical experiments and the concurrent development of a computational model. Each cycle addresses specific steps in the modelling process: basic design, refinement and variation.

Using a model based on existing knowledge of texture perception, the consortium will identify the key mathematical gaps (instead of the gaps in psychological understanding) and create experiments to fill these gaps.

A tangible outcome

Generating a biologically plausible, computational model of the processes taking place when sensory input of textures is interpreted by humans is a challenging task. Two contradictory aspects need to be considered: achieving a more precise model of how the human brain works in this context, while keeping the model sufficiently simple to obtain a computational algorithm.

The modelling will use a new, mathematical approach and will need to incorporate fuzzy logic to accommodate the inherent fuzziness of emotions. When complete, it will be able to measure the extent to which a particular emotion is linked with a given texture in a particular subject.

A set of algorithms, associated with a prescribed set of emotions, will be produced to

enable the synthesizing of artificial texture. Additionally, a set of 24 artificially-generated textures will be designed to bias the experience of 12 emotions (such as happiness, safety and aversion). And since texture perception differs between men and women, the project will also consider gender issues, as well as other contextual aspects.

Affective engineering

The project's objective to develop a new investigative method to assess human interpretation of textures will be able to be applied in subsequent research areas of human sensory and emotional processing.

In achieving its aims, SYNTAX will also contribute to the new and growing discipline of affective engineering, the study of relationships between physical features and their effects on people.

And, if design is one way Europe distinguishes itself from its competitors, SYNTAX offers a technique in which to maintain its edge. After all, the ability to understand and control the impact that texture has on our thinking, feeling and emotion can have an immeasurable effect on the way we design products in the most general sense in the future.