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16.12 / 14:54 ***The sulk behind the smile of the 'Mona Lisa'***

CHICAGO. December 16. KAZINFORM - The smile of the Mona Lisa may seem enigmatic because she is, in fact, a blend of many different emotions.

A computer analysis of the Renaissance masterpiece has found that she is 83 per cent happy, 9 per cent disgusted, 6 per cent fearful and 2 per cent angry.

Leonardo Da Vinci's most famous portrait has been scrutinised by a software programme or algorithm designed to tease apart the different emotions behind a facial expression.

The result is that the smile of the Mona Lisa is broken down into its constituent parts, said Nicu Sebe of the University of Amsterdam.

"No one really shows one single facial expression. We are in fact showing a blend of different emotions and this is true of the Mona Lisa," Dr Sebe said.

"We did this experiment with the portrait because the smile is very famous. Everybody recognises it immediately," he said.

The Mona Lisa is also known as La Gioconda because the sitter is believed to have been the wife of Francesco del Giocondo, a wealthy silk merchant living in Florence.

The woman in the portrait is dressed in the Florentine fashion of her day and is seated in front of a visionary landscape of mountains and gardens. But it is her alluring and aloof expression, denoted by a faint smile at the corner of her mouth, that has given the portrait universal fame.

Scientists, like art critics, have long been fascinated by the Mona Lisa and over the years have tried to understand her smile with the help of modern analytical techniques.

The latest effort uses a well-established psychological principle that breaks down the human condition into six "universal" emotions - happiness, sadness, fear, anger, surprise and disgust - which are said to be behind all facial expressions. Every culture in history has shared these common emotions and the facial expressions used to display them are similar no matter where in the world or in history they were expressed.

Dr Sebe, working with colleagues at the University of Illinois, in Chicago, has developed software designed to see which of these emotions are behind any particular facial expression.

According to New Scientist magazine: "His algorithm examines facial features such as curvature of the lips and crinkles around the eyes, then scores each face with respect to six basic emotions." Dr Sebe said he drew on a database of young female faces to derive an average or "neutral" expression which he used to compare the work against.

Although the overwhelming emotion was one of happiness, the computer found that the second most important was disgust, which could explain why the Mona Lisa may seem to some people to be expressing a sense of irony, said Dr Sebe. "But no one really knows for sure why she looks so enigmatic. We don't know the context of why she was smiling, so it will remain ambiguous," he said.

Other scientists have suggested that the smile is so enigmatic because of a trick of the eye. When viewers look at her mouth directly it does not seem to smile as much as when they look at other parts of the painting.

Professor Margaret Livingstone of Harvard University published research in 2003 showing that the smile appears to come and go in this way because the brain processes light differently depending on whether it comes from the centre of the retina - as with direct viewing of the mouth - or from the edges, which gives us peripheral vision of the smile.

"The elusive quality of the Mona Lisa's smile can be explained by the fact that her smile is almost entirely in low spatial frequencies, and so is seen best by your peripheral vision," Professor Livingstone said.

The latest study by Dr Sebe will only confirm the view that Leonardo Da Vinci managed to exploit - albeit unwittingly - many of the psychological and physical subtleties at the heart of facial expressions.

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