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An emotion detector for baby

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Baby monitors of the future could translate infant cries, so that parents will know for certain whether their child is sleepy, hungry, needing a change, or in pain. Japanese scientists report details of a statistical computer program that can analyze a baby's crying in the *International Journal of Biometrics*.

As any new parent knows, babies have a very loud method of revealing their emotional state - crying. Unfortunately, the parenting handbook does not offer guidance on how to determine what the crying means. Parents sometimes learn with experience that their child's cries may be slightly different depending on their cause, whether hunger or discomfort.

Now, engineers in Japan have turned to an approach to product design, known as kansei engineering, invented in the 1970s by Professor Mitsuo Nagamachi, Dean of Hiroshima International University, which aims to "measure" feelings and emotions.

Tomomasa Nagashima of the Department of Computer Science and Systems Engineering, at Muroran Institute of Technology, in Hokkaido and colleagues explain that the fundamental problem in building an emotion detector for baby's crying is that the baby cannot confirm verbally what its cries mean. Various researchers have tried to classify infant emotions based on an analysis of the crying pattern but with little success so far.

The team has employed sound pattern recognition approach that uses a

statistical analysis of the frequency of cries and the power function of the audio spectrum to classify different types of crying. They were then able to correlate the different recorded audio spectra with a baby's emotional state as confirmed by the child's parents. In their tests recordings of crying babies with a painful genetic disorder, were used to make differentiating between the babies' pained cries and other types of crying more obvious. They achieved 100% success rate in a validation to classify pained cries and "normal" cries.

The research has developed a sound theoretical method for classification of infant emotions, although limited to a specific emotion, based on analysis of the audio spectra of the baby's cries. The technique might one day be incorporated into a portable electronic device, or app, to help parents or carers decide on a course of action when their child is crying.

More information: "Statistical method for classifying cries of baby based on pattern recognition of power spectrum" in Int. J. Biometrics, 2010, 2, 113-123

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