

# Fussy, hungry, or in pain? Scientists create an AI tool to tell babies' cries apart

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Every parent knows the frustration of responding to a baby's cries, wondering if their child is hungry, wet, tired, in need of a hug, or perhaps even in pain. A group of researchers in U.S. has devised a new

artificial intelligence method that can identify and distinguish between normal cry signals and abnormal ones, such as those resulting from an underlying illness. The method, based on a cry language recognition algorithm, promises to be useful to parents at home as well as in healthcare settings, as doctors may use it to discern cries among sick children.

The research was published in the May issue of *IEEE/CAA Journal of Automatica Sinica (JAS)*, a joint publication of the IEEE and the Chinese Association of Automation.

Experienced health care workers and seasoned parents can pretty accurately distinguish among a baby's many needs based on the crying sounds it makes. While each baby's cry is unique, they share some common [features](#) when they result from the same reasons. Identifying the hidden patterns in the cry signal has been a major challenge, and artificial intelligence applications have now been shown to be an appropriate solution within this context.

The new research uses a specific algorithm based on [automatic speech recognition](#) to detect and recognize the features of infant cries. In order to analyze and classify those signals, the team used compressed sensing as a way to process [big data](#) more efficiently. Compressed sensing is a process that reconstructs a signal based on sparse data, and is especially useful when sounds are recorded in noisy environments, which is where baby cries typically take place. In this study, the researchers designed a new cry language recognition algorithm that can distinguish the meanings of both normal and abnormal cry signals in a noisy environment. The algorithm is independent of the individual crier, meaning that it can be used in a broader sense in practical scenarios as a way to recognize and classify various cry features and better understand why babies are crying and how urgent the cries are.

"Like a special language, there is lots of health-related information in various cry sounds. The differences between sound signals actually carry the information. These differences are represented by different features of the cry signals. To recognize and leverage the information, we have to extract the features and then obtain the information in it," says Lichuan Liu, corresponding author and Associate Professor of Electrical Engineering and the Director of Digital Signal Processing Laboratory whose group conducted the research.

The researchers hope that the findings of their study could be applicable to several other medical care circumstances in which decision making relies heavily on experience. "The ultimate goals are healthier [babies](#) and less pressure on parents and care givers," says Liu. "We are looking into collaborations with hospitals and medical research centers, to obtain more data and requirement scenario input, and hopefully we could have some products for clinical practice," she adds.

**More information:** Lichuan Liu et al. Infant cry language analysis and recognition: an experimental approach, *IEEE/CAA Journal of Automatica Sinica* (2019). [DOI: 10.1109/JAS.2019.1911435](https://doi.org/10.1109/JAS.2019.1911435)

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