

# Intelligent audio monitoring for mother and child care innovation

*Tuesday, 22 March 2022 14:00 (30 minutes)*

As the global population ages, economic conditions improve and the childcare environment improves, the views of young families on childcare and consumption have changed dramatically, with “family participation”, “scientific childcare” and “personalised education” becoming the core concepts of family childcare. “Family participation”, “scientific parenting” and “personalised education” have become the core concepts of family parenting. Some studies have shown that the sound of peristalsis, frequency of peristalsis and length of peristalsis in the gastrointestinal tract can be a very accurate predictor of a baby’s needs. Therefore, this study has designed a new parenting intelligence device based on gut sound detection to help parents take care of their babies with less time and effort.

The research uses a combination of micro-sensors and a thin and flexible smart textile flex circuit printing technology. The micro-sensors are miniature microphone modules made using MEMS (MicroElectrical-Mechanical System) technology that provide comfortable, non-invasive and accurate access to the tummy to sense the physiological signals emitted by the gases and fluids flowing in the gut. These vital physiological signals are transmitted by the Smart Textiles flexible circuitry to the soft electronic substrate of the main board, where the digital signal processor receives the signals, processes them and then sends them wirelessly via Bluetooth to the mobile device app. This allows parents of infants with the mobile device to be aware of their baby’s physical condition at the first time.

This study evaluated five smart parenting apps on the market and combined them with innovative ideas to form the functions of this study app: cloud album, vaccination, developmental assessment, growth record, nutrition recipes and parenting encyclopedia, children’s songs, sleepy songs, stories and other contents, covering various sections such as child feeding, growth and development, child care, diseases, parent-child early education and lifestyle habits.

The Kano’s Model was used to analyse the importance and attributes of the functions, combined with the QFD (Quality Function Deployment) model to assess the relationship between the technical feasibility of photos, videos, voice, text, algorithms, microphones and speakers and the needs of users, and to summarise the sequence of function development for the innovative parenting smart device. This study is based on a ‘family-centred’ approach.

The study is based on a ‘family-centred’ design philosophy to promote continuity and holistic care. An app platform system is built with information technology to allow parents to keep track of their baby’s physiological status via their mobile phones, allowing them to understand their baby’s current situation and have contact with them. This study provides a new approach to parenting for the new generation of parents, helping them to take care of their babies with less time and effort, and contributing to the development of smart device manufacturers in the baby market.

**Primary authors:** Dr HAN, Chen (National Taipei University of Technology, Doctoral Program in Design , College of Design); CHEN, Chun Chieh; LIU, Hsin Lan

**Presenters:** Dr HAN, Chen (National Taipei University of Technology, Doctoral Program in Design , College of Design); CHEN, Chun Chieh

**Session Classification:** Humanities, Arts & Social Sciences Applications

**Track Classification:** Track 4: Humanities, Arts, and Social Sciences (HASS) Applications