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## COMMUNI-KATE SPEAKER RECOGNITION TOY

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Communi-Kate enables children to build a personal relationship with a customisable toy. Toys seem to come alive by developing personalities through interaction with their owners: those given lots of attention respond positively, while those that are neglected 'forget' their owners. This unique technology teaches children a sense of responsibility from an early age – and best of all, it happens while they are playing.



### Brief Description

Communi-Kate is a capability (contained on a microchip) that enables suitable children's toys, such as customisable soft toys (for example Build-a-Bears™) and talking dolls, to exhibit bonding behaviour towards their owners.

### Target Market

The invention is of primary interest to toy manufacturers, their target market being parents of children aged between three and nine, but a far wider range of users may be reached with customisation. It additionally shows immense potential as a therapy tool. There has also been tremendous interest from the geriatric market – specifically elderly single people who live in retirement villages and old age homes.

### Value proposition/ Benefits

Most parents are inclined to purchase a toy fitted with this capability for its novelty value, or due to pressure from their children. This invention offers parents the added advantage in that it is capable of changing its behaviour over time – children will not quickly become bored with the toy. This ensures a valuable investment for parents over currently available merchandise, which is soon discarded by children after they lose interest. The potential of Communi-Kate to aid children's personal development should also be emphasised. A toy fitted with Communi-Kate will encourage a sense of responsibility and teach children the importance of building relationships through positive interaction and consistency.

The toy can then be passed on to younger siblings, with whom it will adjust its behaviour depending on its treatment by the new owner, adding to the value of the toy.

### Unique Characteristics

Many customisable and/or 'interactive' dolls and toys are available on the market, but they are generally static in that they do not change their behaviour over time. A toy fitted with Communi-Kate can, however, change its behaviour over time. The more positive attention is given to the toy (i.e. talking gently to it or rocking it), the more responsive the toy will become to that specific person. Conversely, a toy that is neglected will gradually minimise its bonding behaviour until it receives attention from one primary caregiver again. For example, a young child can outgrow the toy and it can be kept for a younger sibling, with whom it will start the bonding process all over again. Moreover, a toy that receives negative attention (for example, being thrown or shouted at) could be programmed to ignore the user completely or to state its 'displeasure' with this behaviour.

### Technical Description

The system contains a processing unit connected to a range of sensors and transducers. The input sensors include a microphone and possibly a camera and accelerometers, which will allow the toy to capture sound, images and motion respectively. On the output side, the toy transmits sounds via a speaker and possibly also movement via actuators.

The processing unit performs speech processing on the sounds and compares extracted acoustic features to a speaker model. If the sounds and accompanying motion and image inputs are deemed to be positive, the speaker model is adjusted to match the current speaker more closely, thereby forming a bond with this user. Conversely, negative sounds and motion/image inputs accompanying the voice of the user will cause the processing unit to adjust the speaker model back to a non-committal background model, thereby forgetting the user. The toy also has the ability to forget the user if it is neglected over a period of time.

The toy reacts in proportion to the positivity of the user interaction and the strength of the match between the speaker model and the current speaker, thereby rewarding positive interaction with the toy.

### **Innovation Status**

A national phase application was filed for this invention.

### **Principal Researchers**

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**YouTube:** Communi-Kate Prototype video <http://www.youtube.com/watch?v=YF6wQVSBuFA>

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