Concise Paper of the NACCQ Conference 2000
Wellington, New Zealand

# The Bionic Baby Grows Up

Peter Brook
Dr Samuel Mann
Greg Trounson
Otago Polytechnic
peterb@tekotago.ac.nz

## 1. Introduction

This short paper gives an account of progress since the 1999 NACCQ Conference where the initial paper (Brook, 1999) was delivered. The paper outlined the idea of a doll containing an embedded microprocessor that sampled real world conditions for storage and later playback. The idea was to create a baby-caring experience for young people. To make this experience more authentic the doll was to emit cries at random intervals. The carer would locate the source of the "problem" and even simulate feeding or playing activities.

## 2. Progress

For a demonstration at the conference, a life-like doll containing the embedded electronics will be on display. Attached to the back of the "baby" is an "umbilical cord" that connects the doll to the printer port of a PC. For proof of concept motivation the team wished to have the doll collect real world signals and send them, on request, to a PC with a graphical front-end program. This has been done via a 555-timer circuit that outputs a digital square wave whose frequency is proportional to the temperature. This frequency is decoded either via an embedded processor within the doll or at the PC itself. Either way a number corresponding to the temperature in degrees celsius is generated from the frequency of the one to zero transitions of the 555-timer circuit. A graph of recent temperature is constantly updated on the PC screen. In the finished version serial EEPROM will hold 24 hours worth of temperature readings. Those readings can be downloaded when the doll is delivered back to the learning institution after being cared for by a young person overnight. A key feature of the design of the Bionic Baby is the learning environment surrounding the debriefing and analysis phase where the carer and the teacher sit down and discuss the data saved in the doll. Light intensity detection hardware and movement sensors will augment the temperature function.

## 3. Conclusion

The Bionic Baby is nearly at the prototype stage. The original design emphasis on robustness, value for money and stressing the didactic post-care analysis are still viable goals for the team. Some commercial possibilities have been suggested to the team and it is clear there is a market for such a product.

## 4. References

**Brook, P. Trounson, R. Mann, S.** "A Bionic Baby for Teaching and Research", Proceedings of the 12th NACCQ, Dunedin, 4-8 July, 1999.