

# Foetal Heart Rate Monitoring From Home?

“SHARING OUR DREAM AND FINDINGS”  
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PARTNERS:



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SUPPORTED BY:

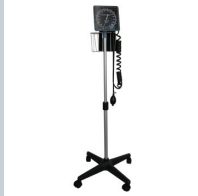
Microsoft®  
**Research**

## Outline

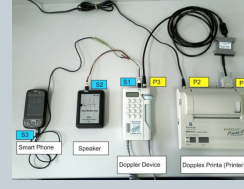
- The dream
- Our motivation
- Some current state-of-the-art
- Some findings
- Challenges ahead
- Value proposition
- Q & A

## The Dream

- Just like for Blood Pressure Monitoring:



- For Foetal Heart Rate (FHR) Monitoring:



## Our motivation

- Increased access to antenatal care among Indigenous communities leads to significantly fewer preterm births among such rural and remote populations. (Panaretto KS, Lee HM, Mitchell MR, et al., "Impact of a collaborative shared antenatal care program for urban Indigenous women: a prospective cohort study" *Medical Journal of Australia* 2005. Available at [http://www.mja.com.au/public/issues/182\\_10\\_160505/pan10902\\_fm.pdf](http://www.mja.com.au/public/issues/182_10_160505/pan10902_fm.pdf) (accessed Oct 2007)).
- While FHR monitoring cannot prevent a problem pregnancy from occurring, it can alert a doctor or nurse to warning signs and allow them to take steps to help the baby. ("Fetal Heart Rate During Labor", *The American College of Obstetricians and Gynaecologists*. Available at [http://www.acog.org/publications/patient\\_education/bp015.cfm?printerFriendly=yes](http://www.acog.org/publications/patient_education/bp015.cfm?printerFriendly=yes) (accessed Oct 2007)).
- Often the tyranny of distance and its associated costs remain a barrier for delivering reasonable quality antenatal care to remote and rural populations.
- Although these remote and rural populations are physically distant from such needed medical care, such communities are often connected to the outside world through modern communication technologies, such as satellite phones. Hence, through the deployment of telemedicine technologies, it is possible to extend some parts of such quality antenatal care to these remote and rural communities. (Gedda R. "Indigenous communities to get satellite phones" *Computerworld*, 15 Oct 2007. Available at <http://www.computerworld.com.au/index.php/id;1082208335;fp;4;fpid;18> (accessed: Oct 2007))
- Microsoft Research provided an US\$100K grant to fund the realisation of our dream.

## Some current state-of-the-art

- Recently GE Health also released a mobile solution – the AirStrip OB®, a tool that connects, in real time, the obstetrician/mid wife, through the wireless and mobile network, to the expectant mother being monitored by a GE's Labour and Delivery (L&D) monitoring system. Although this solution provides much more vital information when compared to our proposal, its full use is limited by its cost and the need for an even more expensive GE L&D monitoring system. Such systems would definitely not be suitable for deployment among remote and rural Indigenous communities in Australia, or any remote communities worldwide. (Sanfillippo JS, "AirStrip OB® in Perinatal Care: New Technology for Remote Patient Monitoring" *OBG Management*, August 2006. Available at: <http://www.obgmanagement.com> (accessed Oct 2007)).
- Cost: US\$500K each



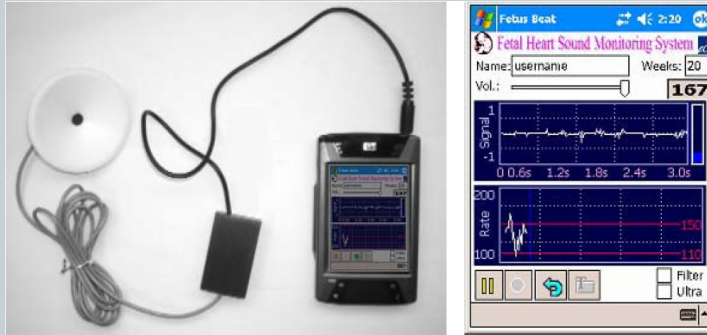
## Some current state-of-the-art

- Huntleigh Fetal Assist® system: AU\$10K each



## Some current state-of-the-art

- Ideas from research laboratories using passive systems:



## Some findings

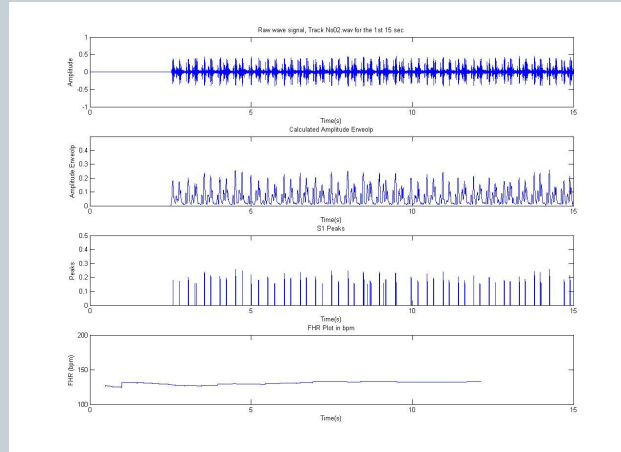
- None do it cheaply with a portable Doppler.



- Jury is still out on accuracy passive systems.

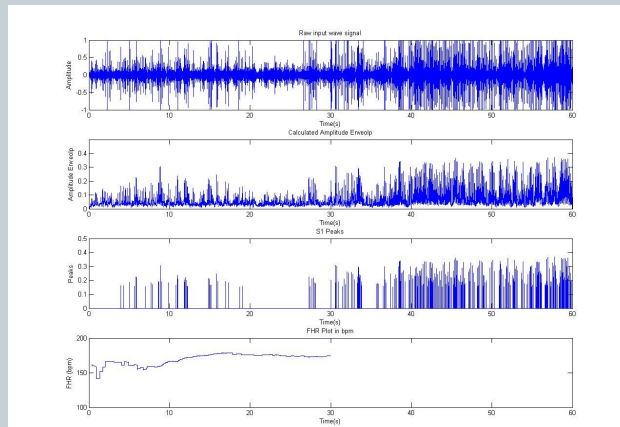
## Some findings

- Developing preliminary algorithms: Peak-to-Peak



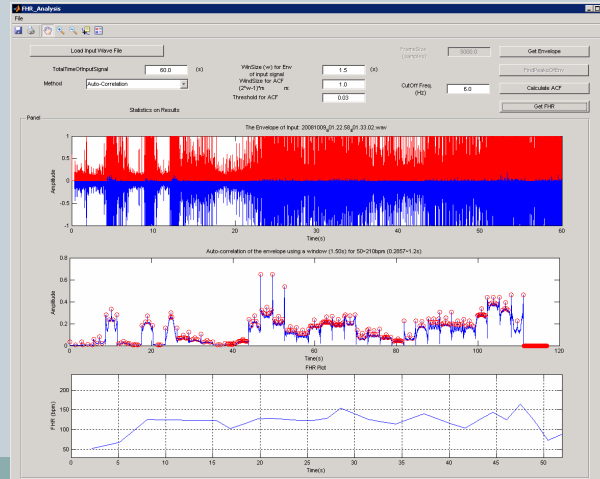
## Some findings

- Developing preliminary algorithms: Peak-to-Peak



## Some findings

- Developing preliminary algorithms: Autocorrelation



## Challenges ahead

- Optimise real time FHR analysis on smart phones.
- Reliable and secure transmission of FHR to home base and clinician off site, over public mobile networks.
- Field trials with urban and rural communities.
- Any interest from your organisation?

## Value proposition



## Q&A

- Any questions?