



Telecare Falls Prevention Workshop

June 16th 2010

Overview of Pixic Ltd



- Hi-Tech System and Silicon chip design consultancy
- Established in the Highlands of Scotland in 2008
- Small, dynamic and highly technical core team
- Specialists in digital imaging and signal processing

- Ongoing mission to invent and deliver new core technologies into the health sector
- SMART:Scotland awarded in January 2010
- “A smart, low-cost fall-detection technology operating in the audio domain”

Management Team

Ed Duncan, CTO



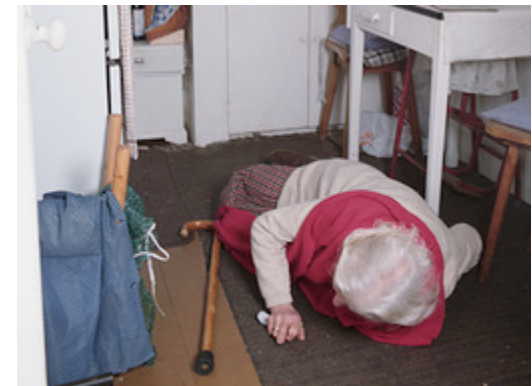
Andrew Kinsey, R&D Director



- Founding member VLSI Vision (acquired by ST Micro)
- 20 years experience of algorithmic design
- Ex Principal technologist at ST Micro
- 25 years experience in electronics industry
- Specialist in VLSI, hardware and software design
- Ex Senior Technologist at ST Micro

Motivation behind the Research

- Falls are leading cause of death from injury in the UK for over 75s
- Over 85% of all fatal falls happen to people over 65, an age where people often live alone/with limited support
- Approx. 1/3 of people over 65 and over half of over 85s will fall at least once per year
- Every 5 hours someone dies after an accidental fall in the home



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Cost to the NHS

- Falls lead to an estimated £15m direct cost to NHS
- In an 800 bed acute hospital there will be about 24 falls a week
- Associated healthcare trusts costs are estimated at £92k per person per year

Current Solutions

- Pendants – needs to be worn, dependent on battery, requires user to press alarm
- MEMS/accelerometer – needs to be worn, battery dependant, simple – can mistake sudden movement (e.g. sitting down quickly) as a fall
- Camera based techniques – very difficult (handling of ambient light etc.). Seen as an intrusion of privacy by user.

Pixic System Overview

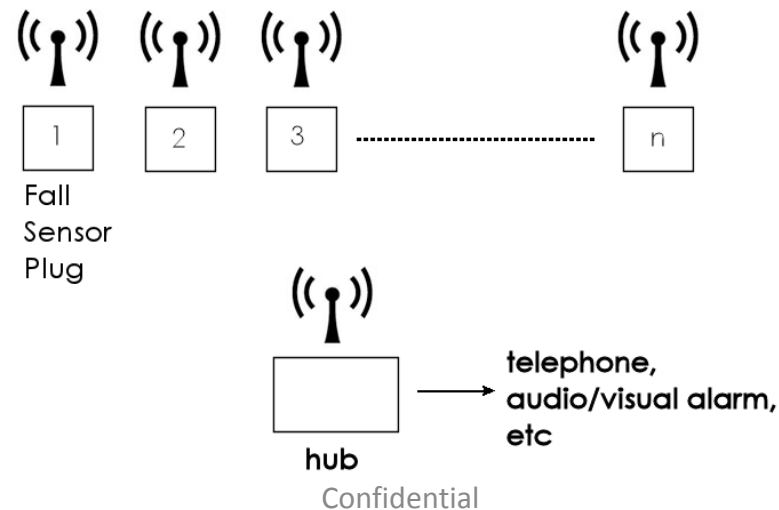
- A new fall sensor based only on acoustics
- Wall based - does not need to be worn
- Simply plugs into a power outlet
- Can detect falls and footfall
- Low Cost

* Picture is a mock-up, actual design to be completed



System Fundamentals

- Fall sensor “plugs” are installed in each room to be monitored
- Acoustic information is gathered from specific parts of the audio spectrum which are unaffected by day to day sounds
- Acoustic data is processed remotely by the sensors
- Relevant data (falls) sent wirelessly to remote “hub”



Proposed Usage Models

Care home Solution

- Sensors in rooms with the base station worn on belt by care home employees
- Currently homes employ staff to walk round and check – this need can be removed

Home Solution – provided to individuals direct or via authorities

- Sensor in room also plugs into phone and calls a set number to alarm
- Could also be made to work with existing service provider's call centres.

Tentative Costings

Care home Solution

- Typical implementation would involve 35 sensors in rooms and 5 belt units
- BOM for sensor unit - £10, selling price £40
- BOM for belt unit £15, selling price £60

Home Solution

- System bundle with telephone hub unit + 2 sensor units covering 2 rooms
- Hub/sensor units BOM £15/£20 respectively. Bundle price to retail £99
- Additional rooms can then be covered by extra sensors – BOM £10, selling price to retail £30

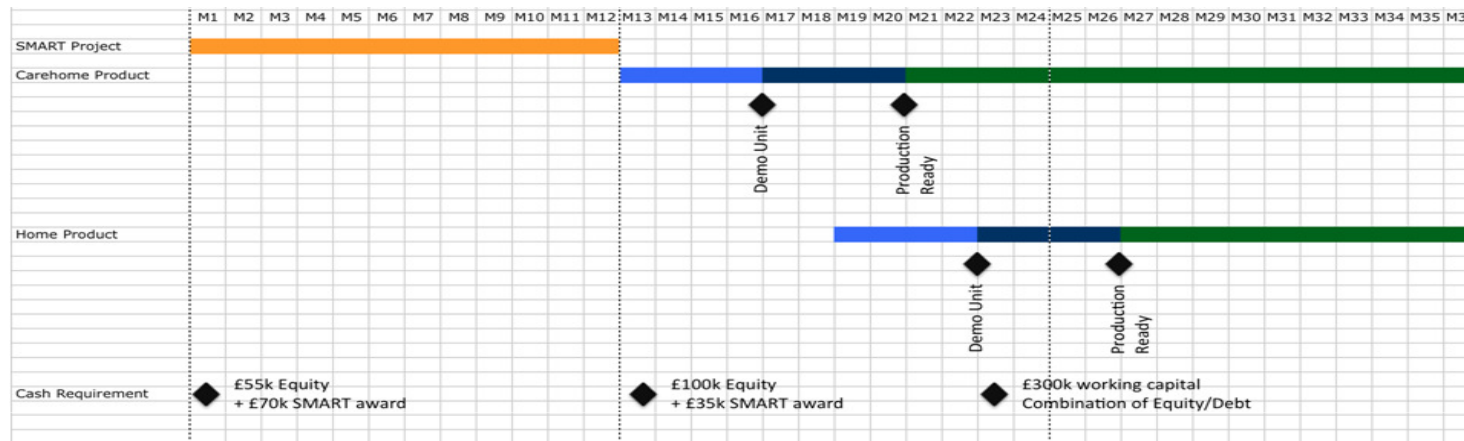
Why is the Pixic solution is better?

- Does not need to be worn. This is particularly important considering 70% of falls occur at night – when belt sensors are less likely to be worn
- Intelligent – can determine which events are innocent and which are likely falls
- Plugs into mains, no worn out batteries
- Can be used to dial a friend, neighbour or family member as well as send an alarm to a call centre
- Low cost/high value aimed at large “consumer markets”

Enhanced Pixic Scope

- Application scalability – common platform allows algorithms to be re-deployed for e.g. pedometry to monitor levels of exercise or activity and fitness within the home
- Falls Prevention? Sophisticated heuristics and internal Metric analysis – attempt to identify trends or changes in walking patterns (slower, more breaks).

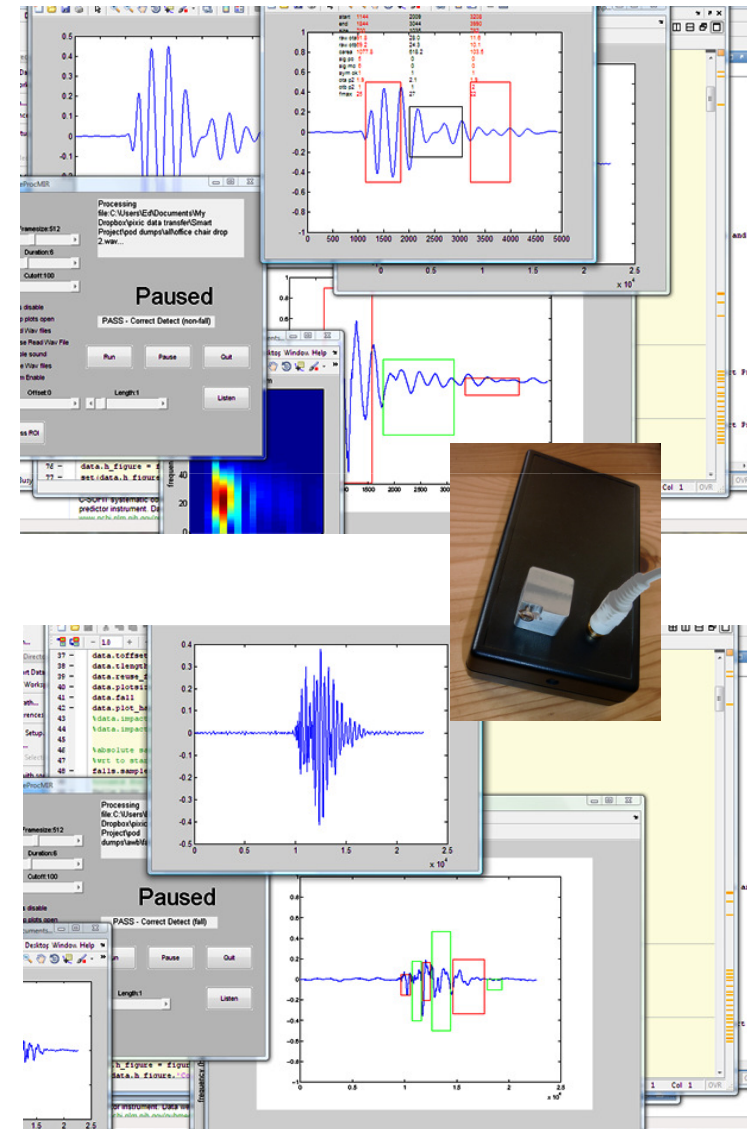
SMART Project Overview



- SMART:Scotland provided essential research funding
- Four key technical “Proof-Of-Concept” phases
 - build the design and test framework
 - Prove technology fundamentals
 - Harden algorithms and secure IP
 - Tangible, real-time system demonstration

SMART Project Current Status

- First two SMART phases successfully completed
- Design framework is complete
 - Acoustic capture “pods” designed, built and tested
 - Baseline Matlab environment in place
 - Library/database of empirical sounds tested successfully
- Baseline “demos” in place
- Early results are very good
- The fundamental concepts of the system seem viable



Smart Project Next Stages

- Complete remaining SMART Project Phases 3 and 4
- Secure IP
- Follow up with care homes and local councils for trials
- Exhaustively test and measure system robustness
- Ramp up on effort to production and manufacture
- Seek strategic partners and investment

Summary

- Pixic is a hi-tech consultancy company specialising in system design and signal processing and hoping to establish partners in the health and telecare sector who could use our services in product or technology conception and development
- Pixic has invented and received the SMART:Scotland award for a new core technology primarily aimed at reliable falls detection but also offering scope for other applications in remote monitoring of exercise and fitness



Thank you

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