

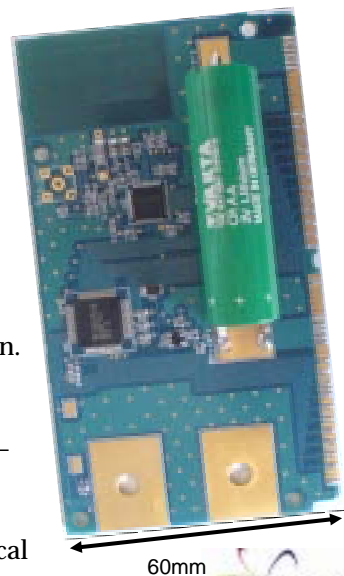
About Ourselves (<http://www.ee.ucl.ac.uk/trg>)

- ❖ Dr. Yang Yang, Dr. John Mitchell and Dr. Izzat Darwazeh, Telecommunication Research Group (TRG), Dept. of Electronic and Electrical Engineering, University College London, UK.
- ❖ Telecommunication Research Group at UCL was founded by Prof. John O'Reilly (President of IEE and CEO of EPSRC).
 - ❖ Yang is the IEEE Region 8 Standards Coordinator and UK&RI Section GOLD Chair. His expertises include 2G/3G mobile communication systems, MAC and routing protocols for wireless ad hoc and sensor networks, and cross-layer protocol/algorithm design and optimisation.
 - ❖ John is an ExCo member of the IEE Communications Professional network. He has expertises in radio over fibre systems, physical channel modelling, hardware design and system integration.
 - ❖ Izzat is currently our Group Leader and has long-term experience and expertises in high-speed circuits design, and wireless system design and implementation.

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What We Have Done – Wireless Node

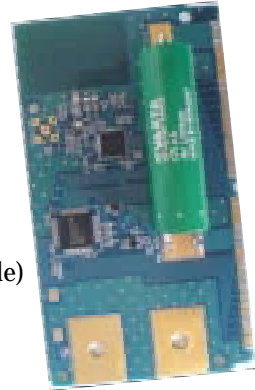
- ❖ Energy-efficient wireless communications are vital to enable 'invisible' remote sensing and frequent data collection.
- ❖ Collaborated with The Royal Orthopaedic Hospital and UCL BioMedia, we have designed and built a wireless sensor node and control software in the 2.4GHz ISM band for a Medical Monitoring Application.
- ❖ The prototype design is 110mm x 60mm x 20mm – expected to reduce to 60mm x 35mm x 20mm. Low Power Consumption – expected life >1 year.
- ❖ Wireless nodes communicate with a base station to relay sensing results to a graphical user interface.



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What We Have Done – Expertises and Technologies

- ❖ Design of Wireless Sensor Nodes
 - ❖ Multiple sensors per node
 - ❖ Location and proximity detection
 - ❖ Scalable to >100 wireless sensor nodes
 - ❖ Low power designs (months to years lifespan)
 - ❖ Small size and license-free ISM frequency band (ambient assistance)
 - ❖ Low cost technologies (potentially few € per node)
- ❖ Design of Control Software
 - ❖ Graphical user interface
 - ❖ Networking to wired communication networks



We would like to join a consortium and contribute to a joint proposal with our experiences, expertises and technologies. Please contact: Dr. Yang Yang, Tel: +44 20 7679 3973, Email: y.yang@ee.ucl.ac.uk, <http://www.ee.ucl.ac.uk/trg>

Ambient Assisted Living for the Aging Society – The Challenge

- ❖ Care networks for elders in our daily life (current solution)
 - ❖ An elder is at the centre of a care network.
 - ❖ Caregivers include family members, friends, cleaners, professionals, pharmacists, doctors, etc.
 - ❖ Caregivers share different duties in providing assistance ranging from day-to-day activities to social support.
- ❖ Challenging problems
 - ❖ For elders: poor memory, noncooperative attitude, independency, mobility and privacy → **They lose the control of their daily lives.**
 - ❖ For caregivers: insufficient communications, unbalanced duty sharing, single-point failure problem, and emergency information sharing → **Key caregivers' own daily lives are greatly affected.**



[Source: S. Consolvo et. al., "Technology for care networks of elders," IEEE Pervasive Computing, vol. 3, no. 2, pp.22-29, Apr-Jun 2004.]

Ambient Assisted Living for the Aging Society – Our Solution

- ❖ **Objective:** use advanced technologies to improve the quality of lives for both elders and caregivers.
 - ❖ **In-door assistant:** ambient wireless sensor networks (cheap and easy to deploy, integrated with wired communication networks), user-centric and friendly interfaces, daily routine monitoring and reminding, data collection and reporting, emergency services, etc.
 - ❖ **Out-door assistant:** portable easy-to-use mobile device, automatic access to wireless communication networks (2G/3G or WLAN), positioning and direction guidance, data collection and reporting, emergency services, etc.
- ❖ **Key benefits** (with the assistances of above technologies)
 - ❖ At a higher-level of control of their daily lives, elders become more independent, confident and satisfied.
 - ❖ All caregivers will share information and duties more effectively and efficiently, so the care network becomes more reliable.
 - ❖ Caregivers will have more time and flexibility to enjoy their lives.