

MIRO plans to set up an Industrial Advisory Group (IAG) to the Hard Hat Heart Rate Sensor project being undertaken by the University of Nottingham. This allows the industrial partners to the outputs from the project and to participate in the trials, with early access to the technology. Industrial partners will be required to contribute only £900 towards administration costs to participate in the project.

The University of Nottingham and Rio Tinto have investigated the use of wearable sensors in occupational health and safety, initially via a PhD CASE award. This work explored the deployment of such sensors for providing health surveillance, and informing health and safety policy. Specifically, this work has looked at the problem of heat strain, the workers physiological response to heat, suffered by those employed in hot environments

The International Standards Organisation (ISO) publishes standards to guide the monitoring of heat stress and heat strain in the work place. Of specific relevance is ISO9886 – Evaluation of thermal strain by physiological measurement – which includes maximum heart rates which should not be exceeded. The human body regulates itself to maintain a core body temperature of approximately 37°C. Deviation from this range can occur when a worker is exposed to heat. This can lead to heat illness, e.g. fatigue (a decline in coordination, alertness or vigilance), fainting, cramps, or exhaustion, and in extreme cases heat stroke. Heat strain is the range of physiological responses that the body uses to regulate its temperature, e.g. by increasing heart rate.

Commercial equipment is available for continuous monitoring of heart rate, for example the Polar heart strap used by athletes. Such a sensor requires the worker to remove his/her shirt and position the sensor appropriately which is obviously tedious and time consuming. For occupational health and safety a balance should be made between the assessment technique used and how practical and socially acceptable it would be for routine use in the field.

Consequently, this has led to the development of a heart rate sensor by the University of Nottingham and Rio Tinto that can be mounted in a safety hard hat – a standard safety item for most at risk workers. The advantage being that the sensor does not need the workers attention nor requires the need for the introduction of new equipment into the workplace. It also offers the additional potential benefit of location determination. As a result the worker wears their hard hat as normal, but their heart rate is monitored unobtrusively and in an emergency their location could be known.

The project which commences in October 2010 for 15 months will involve workplace environment trials of the new wearable sensor array for the monitoring of heat strain. The Industrial Advisory Group will monitor and input into the progress of the work, access all the outputs, assist with the testing of the sensor and have the opportunity for early access to the technology. Industrial partners will be required to contribute only £900 each for the life of the project.

Please contact Abbie Drew at MIRO if you are interested in becoming a member of the IAG.

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