

Teaching old electronics, new tricks: medical applications of well-known industrial electronics

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Abstract: Industrial electronics can often be viewed as just that, “industrial”, where the applications are well-known and understood, and the elements that make them up, such as digital vision, sensors, and automation, are even more well-understood. We thus expect to see these things in those industrial settings, and, these days, in a wide range of consumer uses for smart devices and systems. However, medicine is an area that one would still expect to see significant use of these well-known elements. Somehow, medicine is seen as requiring special electronics, sensors and systems.

This talk considers how well-known – there is nothing new here! – industrial electronics and fundamental computing are revolutionising some areas of medicine with significant clinical impact. The presentation covers three application areas that highlight different aspects. The use of tablet computers and computation are used to control blood sugar levels of intensive care patients around the world, including a cloud interface for easy access to data and quality control auditing. Next, the use of ultrasonic sensors is being developed to create wearable diagnostics that can audit and diagnose impending hip implant failures, far enough before they occur to save cost on revision surgery. Finally, digital cameras, strobe lights and simple actuation are used in a novel breast cancer screening concept in clinical trials to create an all new way of screening patients that is 5x faster and costs 10x less.

These applications range from using industrial electronics to do the same care better to all new medical applications and devices. Each uses simple off the shelf components and systems/software, which, to repeat, means that there is nothing new here. Nothing, except the novel, more efficient healthcare they enable!