Researchers using parallel processing computing could save thousands by using an Xbox

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Dr Simon Scarle

(PhysOrg.com) -- A new study by a University of Warwick researcher has demonstrated that researchers trying to model a range of processes could use the power and capabilities of a particular XBox chip as a much cheaper alternative to other forms of parallel processing hardware.

Dr Simon Scarle, a researcher in the University of Warwick's WMG Digital Laboratory, wished to model how electrical excitations in the heart moved around damaged cardiac cells in order to investigate or even

predict cardiac arrhythmias (abnormal electrical activity in the heart which can lead to a heart attack). To conduct these simulations using traditional CPU based processing one would normally need to book time on a dedicated parallel processing computer or spend thousands on a parallel network of PCs.

Dr Scarle however also had a background in the computer games industry as he had been a Software Engineer at the Warwickshire firm Rare Ltd, part of Microsoft Games Studios. His time there made him very aware of the parallel processing power of Graphical Processing Unit (GPU) of the XBox 360, the popular computer games console played in many homes. He was convinced that this chip could, for a few hundred pounds, be employed to conduct much the same scientific modelling as several thousand pounds of parallel network PCs.

The results of his work have just been published in the journal Computational Biology and Chemistry under the title of "Implications of the Turing completeness of reaction-diffusion models, informed by GPGPU simulations on an XBox 360: Cardiac arrhythmias, re-entry and the Halting problem". The good news is that his hunch was right and the XBox 360 GPU can indeed be used by researchers in exactly the money saving way he envisaged. Simon Scarle said:

"This is a highly effective way of carrying out high end parallel computing on "domestic" hardware for cardiac simulations. Although major reworking of any previous code framework is required, the Xbox 360 is a very easy platform to develop for and this cost can easily be outweighed by the benefits in gained computational power and speed, as well as the relative ease of visualization of the system." However his research does have some bad news for a particular set of cardiac researchers in that his study demonstrates that it is impossible to predict the rise of certain dangerous arrhythmias, as he has shown that cardiac cell models are affected by a specific limitation of computational

systems known as the Halting problem.

Provided by University of Warwick (news : web)