

Playing with Fire: Putting FLAME on an XBox

Dr Simon Scarle



Who am I?

- BSc Mathematical Physics
UMIST
- PhD Theoretical Physics KCL
 - Substitutional defects in semiconductors
- PDRA
 - Extended linear Defects
 - Thin film delamination
 - Ion motion in a polymer
 - Electro-cardio dynamics
- Rare STG
- IDL – Uni of Warwick
 - Serious Games Project
 - Senior Programmer
- Serious Games Institute
 - Technical Developer



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Who am I?

- ▶ Lecturer in Games Technology
 - UWE
 - University of the West of England
 - The other Uni in Bristol
- ▶ Not Currently a User of FLAME
 - But very aware of how clever it is
 - Proposing to develop a new target for FLAME

ME!



- ▶ Fairly unique career path of a research scientist who has also worked in games
- ▶ I'm greatly interested in bringing these together

Previous Work

- ▶ "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"
 - published in Computational Biology and Chemistry
- ▶ Work started as part of the Academic Liaison work at Rare

Previous Work

WARWICK >> NEWS & EVENTS

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



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:

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Media Centre

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

Podcasts

Warwick iCast

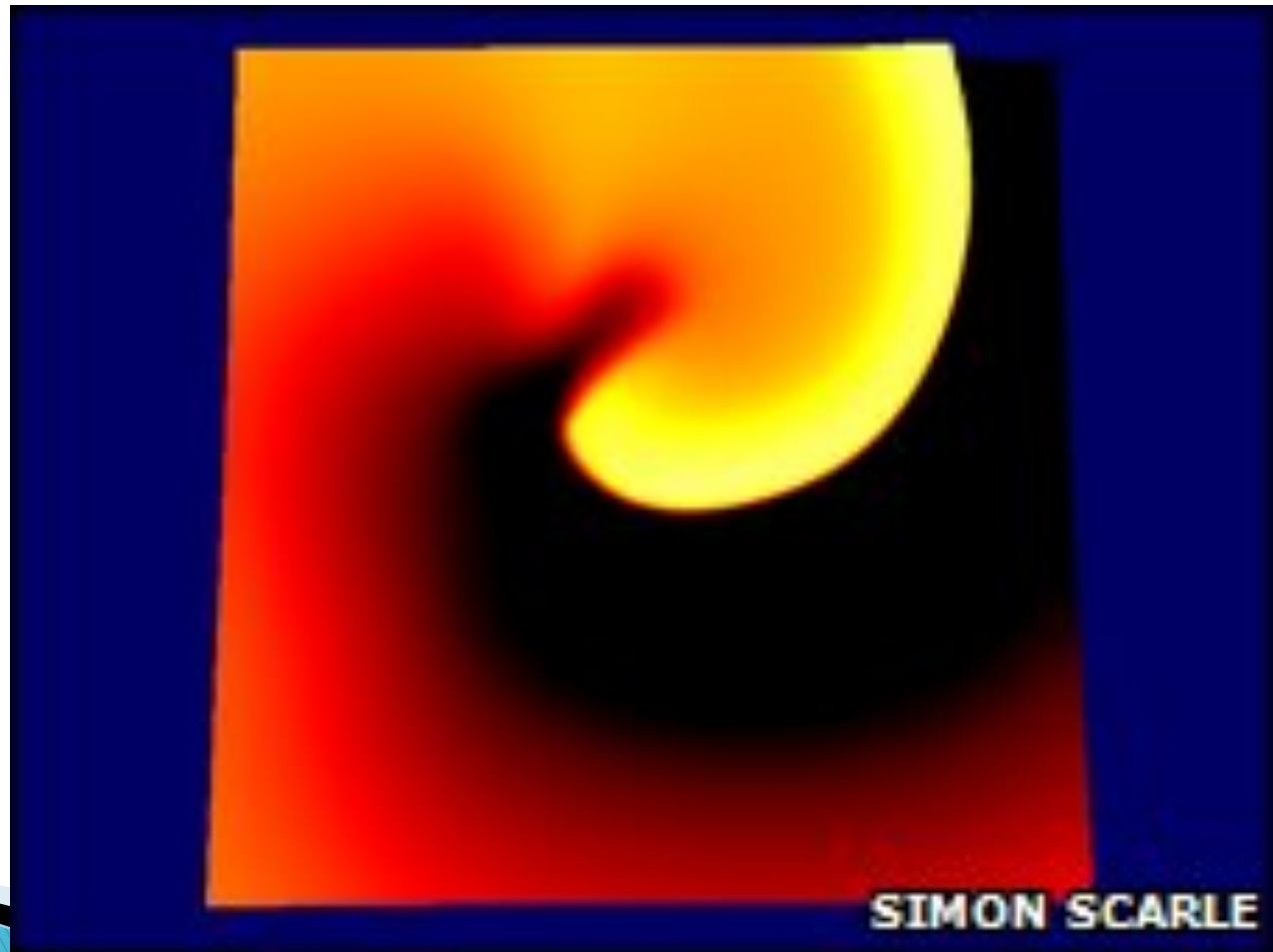
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E-mails

Hi sir

Sir my name is zarshad khan
from Pakistan sir I am an SVT
patient plz let me know how I
should get this machine for
my own treatment

Zarshad khan



E-mails

Hello Dr Scarle,

My name is Keith and I am a student at Avon Middle School in Connecticut. I am in Mr. Rand's eighth grade science class. I read the article about how you used an Xbox GPU to do research modelling for cardiac arrhythmias. I have 2 questions for you for my school current events.

1. Did you actually use an Xbox to do your testing or did you take it apart for the chip and put it in another machine? And did you do all the reworking for the code?
2. What made you switch from a software engineer on games to doing medical research on cardiac arrhythmias?

Thank you for your time.

Keith



XNA FLAME

- ▶ Produce an XNA version of FLAME
 - Publicly available SDK for XBox 360
- ▶ Produce “interactive” versions of your simulations using same/similar input as for FLAME
 - Games Controllers
 - KINECT
 - Potentially run on an XBox 360
 - could be released as part of the indie/community games

A photograph of a stage performance. On the left side, there is a series of glowing purple arches that recede into the distance, creating a tunnel-like effect. The stage floor is dark, and there are some faint lights scattered across it. In the foreground, the silhouettes of a large audience are visible, looking towards the stage. The overall lighting is dim, with the purple arches providing the primary source of light.

<http://www.youtube.com/watch?v=dvfZ2kkSSX4>

Why?

- ▶ Game-like interactions with simulations
 - ▶ Games consoles especially the Next Gen are the cheapest “bangs per buck hardware” you can get
 - ▶ Console developers want to show that their hardware is the most powerful out there and the next gen consoles are big news
 - ▶ Researchers would like to like run their simulations on cheap and powerful hardware and also some publicity would nice
 - ▶ I’m sure we could make some sort of arrangement here!
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