



**Bournemouth  
University**

# **New Approaches to 3D Algorithm Design**

A one-day, high-level briefing session on a new algebraic framework for unifying 3D algorithms in computer games, computer animation and 3D computer graphics.

**Friday 14 September 2007**

**The Moving Picture Company,  
127 Wardour Street,  
London, W1F 0NL**

**Speakers:**

**Professor John Vince - Bournemouth University**

**Dr Chris Doran - Geomerics Ltd**

**Dr Joan Lasenby - Cambridge University**

**Dr Hugh Vincent - Consultant**

**A Bournemouth University CGI Workshop**

# Speaker details

## **Professor John Vince**

Extensive experience of computer graphics as an academic and a Chief Scientist in industry. He has written and edited over 30 books on computer animation, virtual reality and mathematics.

## **Dr Chris Doran**

Dr Doran has published widely on aspects of mathematics and physics and recently focused attention on applications of GA in engineering and computer science.

He co-authored the book *Geometric Algebra for Physicists* and is currently COO of Geomerics Ltd.

## **Dr Joan Lasenby**

Held a Royal Society University Research Fellowship for research into applications of GA in engineering from 1994 to 2000. Currently a University lecturer in the Signal Processing Group of the Cambridge University Engineering department.

## **Dr Hugh Vincent**

Has investigated the use of GA to interactively model the geometry of Euclidian and non-Euclidian spaces. He has lectured in mathematics and software design and has a particular interest in aspects of geometry.

# New Approaches to 3D Algorithm Design

Geometric algebra is a powerful algebra for manipulating geometric elements such as lines, areas and volumes, with applications in physics, dynamics and computer graphics. Seminars have already been held at SIGGRAPH and international computer games conferences where the benefits and application of geometric algebra in 3D geometry, motion capture, animation, 3D rotations, rendering and collision detection have been discussed.

## **Who is it for?**

Professionals associated with computer graphics, computer animation and computer games as well as programmers, mathematicians, researchers and scientists.

## **What will I get out of it?**

You will:

- Gain new insights into geometric algebra
- Understand the benefits of using geometric algebra-based algorithms
- Appreciate a wide range of technical documentation on geometric algebra
- Be able to make decisions on how to exploit this knowledge
- Create route maps for developing further knowledge of this subject
- Have opportunities to interact with speakers and other delegates

# Workshop programme

Friday 14 September 2007

<b>am</b>	
9.30	<b>Registration and coffee</b>
10.00 - 11.30	<b>Session 1 - Professor John Vince</b> <b>Introduction to Geometric Algebra</b> <ul style="list-style-type: none"><li>▪ Review of complex numbers, vectors and quaternions</li><li>▪ Bivectors, trivectors and the wedge product</li><li>▪ The geometric product</li></ul>
11:30 - 11:45	<b>Tea/Coffee</b>
11.45 - 1.15	<b>Session 2 - Dr Hugh Vincent</b> <b>The Conformal Model</b> <ul style="list-style-type: none"><li>▪ Conformal representation</li><li>▪ Null vectors</li><li>▪ Conformal transformations</li></ul>
<b>pm</b>	
1.15 - 2.00	<b>Lunch</b>
2.00 - 3.30	<b>Session 3 - Dr Chris Doran</b> <b>Representing Geometric Objects</b> <ul style="list-style-type: none"><li>▪ Representing lines, circles, planes and spheres</li><li>▪ The 'meet' and 'join' operations</li><li>▪ 3D intersections</li></ul>
3.30 - 3.45	<b>Tea/Coffee</b>
3.45 - 4:45	<b>Session 4 - Dr Joan Lasenby</b> <b>Applications of Geometric Algebra</b> <ul style="list-style-type: none"><li>▪ Motion analysis</li><li>▪ Pose control</li><li>▪ Rendering</li></ul>
4.45	<b>Close of Workshop</b>

# Booking form

New Approaches to 3D Algorithm Design, CGI Workshop, The Media School  
14 September 2007 9.00am-4.45pm

Delegate details				
Name:				
Job Title:				
Organisation:				
Address:				
Post Code:				
Phone No:		Email:		
Special dietary or access requirements:				
Booking Details: (tick one box)	Full Fee		'Early Bird' Fee *	
	Industry delegate	£275	Industry delegate	£250
	Member of UK Post/TIGA/IMA	£250	Member of UK Post/TIGA/IMA	£225
	Academic/student delegate	£175	Academic/student delegate	£155
	Member of IMA	£155	Member of IMA	£145
	* 'Early Bird' applications must be received before 31 July 2007.			
<ul style="list-style-type: none"> <li>For multiple bookings please photocopy this form and return to the address below stating primary contact name.</li> </ul>				

Payment methods		
Cheque: Payable to Bournemouth University		
Credit or Debit Card, please supply the following details:		
Card type & number:		
Valid from:	Expiry date:	Switch issue no:
Cardholder name:		

Signature:		Date:	
Office use only	Account Code	1230	Activity Code ARG18X
Please email, post or fax your completed booking form (and cheque if applicable) to:			

<p><b>Joyce Power</b> The Media School, W427 Weymouth House, Talbot Campus, Fern Barrow, Poole BH12 5BB United Kingdom</p> <p>Tel: + 44 (0) 1202 965860 Fax: + 44 (0) 1202 965530 Email: <a href="mailto:jpowers@bournemouth.ac.uk">jpowers@bournemouth.ac.uk</a></p>	<p><b>Cancellations</b> must be made in writing. A refund of 80% will be made if you cancel 2 weeks prior to the event. After that date, the whole fee will be forfeited.</p> <p>Substitute delegates are welcome at no extra charge but must be confirmed by email or fax before the event.</p> <p>Confirmation and joining instructions will be sent on receipt of booking form.</p>
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