225 Station Road, Addlestone, Surrey, KT15 2PN, UK · drkennymitchell@yahoo.com · 01932 853 387 · 0777 168 1430

Dr Kenneth John Mitchell

Profile

Kenny is a research lead providing practical technology solutions to The Walt Disney Company Ltd at Disney Research's Edinburgh office, outpost of the Disney Research Zurich lab. Over the past 15 years he has shipped games using high-end graphics technologies including voxels, volumetric light scattering, motion blur and curved surfaces. His PhD introduced the use of real-time 3D for information visualization on consumer hardware, including a novel recursive perspective projection technique. In between contributing to Split Second, Speilberg's Boom Blox (Bafta winner), and the Harry Potter franchise games he is involved in developing new intellectual properties. His work includes collaboration with Pixar Research, Disney Research Pittsburgh, Feature Animation, Imagineering and Consumer Products, and many successful funded University and Industry consortium collaborations. He is the most senior Disney research representative in the UK.

Employment

2011-present. Disney Research, The Walt Disney Company Ltd — Edinburgh

- Real time vision, rendering and visualization topics.
- Work package leader EU FP7 PPP project, Future Internet – Content, augmented reality focus. EU consortium.
- SIGGRAPH General committee member, games committee. ACM/IEEE member.
- EPSRC Strategic Advisory Network member and Digital Economy Panel Member
- Awarded patent on Interactive Handheld 3D (~10 more in filing process).
- First demonstration of real-time global illumination on mobile devices, RadStorm. Continuation of topics below,

2008-2011. Black Rock Studio, Disney Interactive Studios — Brighton

Research Lead

- Research team of up to 5 members, including 2 post doctorate researchers reporting to Peter-Pike Sloan in Utah.
- R&D support for production of Split Second and concepts within Core Technology Team, including motion blur, ambient occlusion, adding robust undo editing system, animation system optimization.
- My real-time God Rays [Mitchell'07] technique used in Toy Story 3 and stereo method used in Cars 2 games.
- Industrial supervisor for Disney's first EPSRC funded engineering doctorates including establishing legal agreements with University College London, Bath, Napier, Edinburgh and Bournemouth Universities. EngD topics include advanced rendering, capture, lighting, visualization and production workflow technologies.
- Cambridge University group project on pico-projector games, presented 3 seminars on Black Rock technology.
- Filed 3 patents with Disney inventor awards (7 more in progress). On stereoscopic 3D rendering and authoring, glasses free 3D, augmented reality.
- SIGGRAPH. General committee member, games committee, session chair. Presented 2 talks, 1 ETech installation and contributed to 3 technical papers.
- EPSRC User Panel. UKTI Games Mission. Bafta Story in Games Review Panel

2002–2008. UK Studio/Bright Light, Electronic Arts — Surrey

Lead Programmer

- Developed world-wide Halogen/ShaderCore platform technology for Wii, PS2, PS3, XBox360 and PC/Mac.
- Technical leadership role on graphics, streaming, pipeline, physics and development life cycle.
- Supervised 3 internal research projects on graphics with University College London and Lund, Sweden.
- Served on Electronic Arts Journal review board, an internal research journal. Most prolific article contributor.
- Developed 5 game technology prototypes and stock award for 'Oliver' game pitch presented to studio.
- Prepared patents on streaming, post-process anti-aliasing and lighting. Reviewed patent on subdivision surfaces.
- Transferred to UK Studio from Westwood at highest programmer grade to develop Harry Potter, subsequently a billion dollar lifetime revenue franchise spanning all major gaming platforms.

1999–2002. Westwood Studios, Electronic Arts — Las Vegas

Director of 3D Computer Graphics Software Engineering

- Architect and developer of advanced scalable shader systems.
- Gave first public demonstration of vertex displacement mapping hardware at GDC 2002 with Matrox.
- Completed rendering engine for Pirates including VU code on PS2 and vertex/pixel shaders on XBox.
- Developed real-time Catmul-Clark & Loop subdivision surface engine prototype.

1996–1999 VIS Interactive plc — Dunfermline

Software Consultant

- Developed NURBS renderer on PC, PlayStation and Dreamcast, BSP/Portal renderer on PC.
- Shipped the first voxel animated character renderer on PC for networked multi-player game, HEDZ.
- Completed configuration, scalable rendering framework and VFX for all graphics cards in HEDZ using Direct3D
- Attended Immersion'98, DirectX 6 Seminar, Meltdown'98, and DirectX 7 / OpenGL Fahrenheit Design Review.

1994–1997 Napier University — Edinburgh

Research Assistant

- Highest paid PhD researcher, employed in doctoral research. Gained PhD in 1998.
- First demonstration of real-time interactive 3D database visualization on PC (Renderware & DirectX)
- Contributed to half of department's research publications in 96/97.

Contracts

2001 2Ce Inc / CubicEye Seattle / Philadelphia

- Developed rendering engine for innovate 3D web browser based on my PhD/Eurographics paper.

1997 Petroleum Science and Technology Institute Edinburgh

- Developed corporate structure information visualization system

Education

1992-1998 Napier University Edinburgh

PhD Three Dimensional Database Environments

- Completed a theory on user-interfaces to databases aided by the construction of a user-interface development tool to use a conceptual object-oriented data language to analyze and design user-interfaces to object-oriented databases. First consumer 3D information visualization prototypes and a number of innovative interactive 3D system designs.

MSc Large Software Systems Development

- First masters degree course in UK based on object oriented software engineering. Also covered evolutionary algorithms and human computer interaction.

1988-1992 Edinburgh University Edinburgh

BSc(Hons) Computer Science and Artificial Intelligence

- Top SHEFC rated course in world-class CS and AI departments. Developed voxel method for ray tracing implicit surfaces using constructive solid geometry & interval arithmetic for final year project. 100% in vision/robotics lab.

1983-1988 Biggar High School Biggar

- 8 'O'Grades, 6 Highers, 3 CSYS, 4 SCOTVEC, and School Prize for Accounting

Interests

- Computer games, real-time graphics, art, sci-fi, football, cars, playing guitar, films, tennis, photography, travel.

Other

- Game designing / programming since 1982, when I won a game programming competition
- Founded and chaired school computer club

Personal

- Date of Birth: 3rd, August, 1970 (born East Kilbride, grew up in South Lanarkshire)
- Marital Status: Married - Emma Louise (born Lusaka, grew up in Ripon & Inverness, British Passport)
- Passport: British Current Driving License: Full Clean UK Home: Owner.
- Children: 1 - Scarlet Alexandra. Age 10 (born Las Vegas, growing up in Surrey & Scotland, British/US Passport)
- Availability: Licensing via Disney business units, consultations, and invited talks.

Academic Publications

H.Bowles, K.Mitchell, B.Sumner, J.Moore, M.Gross (2012) Iterative Image Warping, Eurographics Technical Paper.
B.Loos, L.Antani, K.Mitchell, D.Nourouzezahrai, W.Jarosz, P.-P.Sloan (2011) Modular Radiance Transfer. SIGGRAPH Asia
T.Oskam, A.Hornung, H.Bowles, K.Mitchell, M.Gross (2011) OSCAM: Optimized Stereoscopic Camera Control for Interactive 3D, SIGGRAPH Asia.
C.Kim, A.Hornung, M.Gross (2011) Multi-Perspective Stereoscopy from Light Fields, SIGGRAPH Asia (authored source light field data).
D.Nourourzezahrai, S.Gieger, K.Mitchell, R.Sumner, W.Jarosz, M.Gross (2011) Light Factorization for Mixed-Frequency Shadows in Augmented Reality, International Symposium on Mixed and Augmented Reality.
B.Loos, K.Mitchell, L.Antani, D.Nourouzezahrai, W.Jarosz, P.-P.Sloan (2011) Runtime Implementation of Modular Radiance Transfer, *PRESENTED*. SIGGRAPH Talk.
A.Israr, N.Hutchinson, H.Bowles, K.Mitchell, I.Poupyrev (2011) Surround Haptics, SIGGRAPH Emerging Technology.
E.Jimenez, K.Mitchell, F.Seron (2011) Capture and Analysis of Racing Gameplay Metrics, IEEE Software.
Y.Yemelyenov, K.Mitchell (2011) Bridging Ray and Raster Processing on GPUs, London Graphics Seminar.
K.Mitchell (2011) New Business Opportunities in Games, *PRESENTED.* ANIMEX.
K.Mitchell (2010) Bridging Ray and Raster Processing on GPUs, *PRESENTED*. GPU Technology Conference.
M.Ritchie, G.Modern, K.Mitchell (2010) Split Second Motion Blur, *PRESENTED*. SIGGRAPH Talk.
K.Mitchell (2008) Methods for Dynamic Photorealistic Terrain Rendering, Best of Game Programming Gems.
K.Mitchell (2008) Five Game Technology Prototypes, Prototyping Club, *PRESENTED:* Bright Light Studio, Guildford.
K.Mitchell (2008) Shader Development and Optimization, Sony DevStation 08. *PRESENTED:* BFI Southbank, London.
K.Mitchell (2007) Post Process Techniques, EA WW Lighting Workshop, *PRESENTED:* Bright Light Studio, Guildford.
K.Mitchell (2007) Volumetric Light Scattering as a Post Process, GPU Gems 3. p275-292.
K.Mitchell (2006) Next Generation Shader Development, *PRESENTED.* IET Conference on Visual Media Production.
S.Pilgrim, K.Mitchell, A.Aguado, A.Steed (2006) Progressive Character Skinning, SIGGRAPH Sketch.
J.Brewer, K.Mitchell (2005) Intelligent Cameras, Electronic Arts Journal.
M.Ohstrom, A.Aguado, K.Mitchell (2003) Spherical Harmonics, Precomputed Radiance Transfer & Realtime Radiosity, EA Journal.
K.Mitchell (2003) Pixel Shader Optimizations for Terrain Rendering, Graphics Programming Methods, p327-335.
K.Mitchell (2002) Real-time Hardware Displacement Mapping, Matrox Technology Presentation, GDC. *PRESENTED*
K.Mitchell (2002) Real-time Hardware Displacement Mapping, DirectX Day, GDC. *PRESENTED*
N.Hoffman, K.Mitchell (2002) Methods for Dynamic, Photorealistic Terrain Lighting, Game Programming GEMS 3.
N.Hoffman, K.Mitchell (2002) Real-Time Photorealistic Terrain Lighting, Electronic Arts Journal.
N.Hoffman, K.Mitchell (2001) Real-Time Photorealistic Terrain Lighting, Game Developer Magazine, July.
K.Mitchell (2001) Real-Time Full Scene Anti-Aliasing for PCs and Consoles, proc. of GDC 2001. *PRESENTED*
N. Hoffman, K.Mitchell (2001) Real-Time Photorealistic Terrain Lighting, proc. of GDC 2001. *PRESENTED*
J.McNeill, L. Castle, K.Mitchell, & J.D. Lanier (2000) Real-Time Continuous LOD for PCs & Consoles, proc. of GDC 2000. PRESENTED
K.Mitchell (1998) Three Dimensional Database Environments, PhD Thesis, Edinburgh Napier University.
K.Mitchell (1997) CHASSIS: Portable Persistent Meta Model of Napier Object Oriented Data Language, TR, Edinburgh Napier University.
K.Mitchell (1997) BOOT: A Basic Object Oriented Transfer Engine for Persistence in C++, TR, Edinburgh Napier University.
K.Mitchell & J.Kennedy (1997) The Perspective Tunnel: An Inside View on Smoothly Integrating Detail and Context, in proc. of EuroGraphics Workshop on Visualization in Scientific Computing. *PRESENTED*: Bologne-Sur-Mer, France.
K.Mitchell & J.Kennedy (1997) To Infinity & Beyond:Texel-Oriented Techniques Visualizing Large DBs, TR, Edinburgh Napier University
K.Mitchell, J.Kennedy, P.Barclay (1997) Using Active Constructs in User-Interfaces to Object Oriented Databases, proceedings of International Database Engineering and Applications Symposium 97
J.Kennedy, K.Mitchell, P.Barclay (1996) A Framework for Information Visualization, ACM SIGMOD Record, special issue on InfoVis.
K.Mitchell, J.Kennedy, P.Barclay (1996) DRIVE: An Environment for the Organized Construction of User-Interfaces to Databases, *PRESENTED*. in proc of the 3rd International Workshop on Interfaces to Databases, Napier University.
J. Boyle, P. Lowit, K. Mitchell (1996) 3D or Not 3D, in proc. of 3rd FADIVA Workshop.
J.Kennedy, K.Mitchell, P.Barclay (1996) Describing and Characterizing Visualizations, in proc. of 3rd FADIVA Workshop.

K.Mitchell, J.Kennedy, P.Barclay (1996) A Framework for User-Interfaces to Databases, in proc. Of the International Workshop on Advanced Visual Interfaces'96. *PRESENTED*: Gubbio, Italy.
J.Kennedy, K.Mitchell, P.Barclay, B. Marshall (1995) 3D Information Visualization: Identifying and Measuring Success, in proc. of 2nd FADIVA Workshop, Glasgow University
K.Mitchell, J.Kennedy and P.Barclay (1995) Using a Conceptual Language to Describe a Database and its Interface, , *PRESENTED.* in proc. of the 13th British National Conference on Databases. 940:13,p101-119. July. Springer-Verlag.
K.Mitchell, J.Kennedy and P.Barclay (1994) Techniques for Improved Communication of Schemata, TR, Edinburgh Napier University
K.Mitchell, J.Kennedy and P.Barclay (1994) A Notation Independent Object Modeling Environment, TR, Edinburgh Napier University
K.Mitchell (1994) Schema Visualization, MSc Thesis, Edinburgh Napier University
K.Mitchell (1992) Ray Tracing Implicit Surfaces with Constructive Solid Geometry, BSc Report, Edinburgh University.

Published Games

Rad Storm (2012) iPhone, iPad, iPod (app store technical demo/game). Disney Research. Research Lead.

Split Second (2010) PS3, XBox360. Black Rock Studio, Disney Interactive Studios. Research Lead.

Harry Potter: Half Blood Prince (2009) Wii, PS2, PS3, XBox360, PC, Mac, Bright Light (UK) EA. Graphics consultant.

Trivial Pursuit (2009) Wii, PS2, PS3, XBox360, Bright Light Studio (UK) Electronic Arts. Lead graphics programmer.

Spore (2009) Wii. Montréal Studio. Electronic Arts. Graphics consultant.

Nerf N-Strike (2009) Wii. Salt Lake Studio. Electronic Arts. Graphics consultant.

Littlest Pet Shop (2008) Wii, PC. Salt Lake Studio. Electronic Arts. Graphics consultant.

Family Game Night (2008) Wii, PS2, XBox360, PS3. Bright Light Studio. Electronic Arts. Graphics consultant.

Monopoly (2008) Wii, PS2, PS3, XBox360, Bright Light Studio (UK) Electronic Arts. Lead programmer.

Zubo (2008) DS, Bright Light Studio (UK) Electronic Arts. Graphics Programmer.

Boom Blox (2008) Wii, Los Angeles Studio. Electronic Arts. Graphics Programmer.

Harry Potter: Order of the Phoenix (2007) PS2, PS3, XBox360, PC/Mac, Wii. UK Studio. EA. Senior graphics programmer.

Harry Potter: Goblet of Fire (2005) PS2, PC, XBox, PSP. UK Studio. Electronic Arts. Senior graphics programmer.

Battlefield: Modern Combat (2005) XBox360. UK Studio. Electronic Arts. Core technology graphics programmer.

Harry Potter: Prisoner of Azkaban (2004) PS2, XBox. UK Studio. Electronic Arts. Senior graphics programmer.

C&C Generals (2003) PC / DirectX. Westwood Studios. Electronic Arts. Graphics consultant.

Pirates: The Legend of Black Kat (2002), PS2, XBox. Westwood Studios. Electronic Arts. Technical lead programmer.

C&C Renegade (2002) PC / DirectX. Westwood Studios. Electronic Arts. Graphics consultant.

Earth and Beyond (2002) PC / DirectX. Westwood Studios. Electronic Arts. Graphics programmer.

State of Emergency (2002) PC / DirectX, PS2. Vis Interactive. Take 2 Interactive. Prototype programming.

F1 (2001) PS2. UK Studio. Electronic Arts. Graphics consultant.

Emperor: Battle for Dune (2001) PC / DirectX. Intelligent Games. Electronic Arts. Graphics consultant.

Earthworm Jim 3D (1999) PC / DirectX. Vis Interactive. Rockstar Games. Graphics consultant.

H.E.D.Z. (1998) PC / DirectX. Vis Interactive. Hasbro Interactive. Lead graphics programmer.