

University of St Andrews
School of Computer Science

Distinguished Lecture Series 2000/01

**Games and Entertainment -
picture of the future, novel technologies and
usability aspects**

by

Peter Astheimer, Tim Taylor, Lucy Joyner

IC CAVE, University of Abertay

Thursday 19th April 2001
Lecture Theatre A
Physical Sciences, North Haugh, St Andrews

This Distinguished Lecture looks at the current and expected developments and outcomes in the games and entertainment industry. It further highlights in more detail promising technologies like modular augmented computing and artificial life and motivates the importance of human factors covered by the discipline of usability engineering.

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Biographies

Peter Astheimer received a Ph.D. (r.-Ing.) for his thesis "sonification of numerical data for visualization and virtual reality" from the Technical University of Darmstadt in 1995. From 1987 to 1996 he had been working for the Fraunhofer-Institute for Computer Graphics (FhG-IGD) in Darmstadt, mainly on visualisation and virtual reality technologies and applications. From 1996 to 2000 Peter Astheimer had been working for Siemens AG, Corporate Technology, Innovationfield Information & Communications in Munich. His task was to analyse the future of information and communication, identify and implement business opportunities within Siemens business units. Since 2000 Peter Astheimer acts as founding Director and Professor of Virtual Reality of the International Centre for Computer Games and Virtual Entertainment (IC CAVE?) at the University of Abertay, Dundee. The centre's goal is to enable new business by applying innovative technology in industry and funded projects. Peter Astheimer has published and co-authored more than 50 papers and held numerous tutorials and lectures worldwide. He is on the program committee for a number of conferences/workshops, a member of IEEE and holds several patents. He is a lifelong member of Bstoric Scotland.

Tim Taylor holds an MA in Natural Sciences from Trinity College, Cambridge, where he specialized in Experimental Psychology and also studied a variety of other subjects from the biological and physical sciences. On graduating from Cambridge he moved to Edinburgh University, where he was awarded an MSc (with distinction) in Artificial Intelligence. After working as a professional computer programmer in London for a couple of years, he returned to Edinburgh University to pursue a PhD in Artificial Life, which he was awarded in 1999. He has subsequently worked in artificial life research for MathEngine PLC in Oxford, and has been a research associate in IC CAVE at the University of Abertay Dundee since March 2000.

Lucy Joyner holds a BSc (Hons) in Psychology with Sociology from the University of Bath. As an undergraduate she worked at the University of Dundee on the development of a comprehensive threefactor model of stress states and studied stress responses during simulated driving. After graduating she returned to the University of Dundee specialising in mood state and stress research, including the validation of a comprehensive stress state questionnaire and a questionnaire measure of driver stress and affect. She spent a year working on a project studying the development of social and group identity, and contextual variability in ingroup stereotype while studying for, and gaining, a COSCA certificate in counselling skills. Lucy has been a research associate in IC CAVE at the University of Abertay Dundee since June 2000.

Programme

11.15 - 12.30

The future of Games and Entertainment

Peter Astheimer

Entertainment is a vital part of life at leisure, home and work - and there are 6 Billion people on earth! The leisure system is analysed from a futurist's holistic viewpoint and significant trends and shaping factors are identified. Games and entertainment industry revenues have long surpassed box office and home video retail revenues and the production of a games title can consume a larger budget than a Hollywood movie. Despite maturation and consolidation, the industry still enjoys respectable two-digit growth rates. Development of products is quite demanding with vivid competition, bringing new technologies to a variety of platforms and making it enjoyable and affordable for virtually everyone. Many virtual reality technologies are now available on a consumer scale and games are incorporating an increasing number of sensory channels. The combination of Virtual worlds, augmented reality technology and modular wearable computing gear opens a wealth of novel applications. Currently explored in industry for hands-free operation and multivendor/multiproduct service and maintenance it is expected to make a significant impact in conjunction with 3G mobile technologies for personal purposes in the future.

14.00 - 15.15

Evolving Creatures in Virtual Worlds

Tim Taylor

The realistic physical modelling of creatures in games and virtual worlds is becoming a viable alternative to more traditional animation techniques. Physical modelling can enhance realism and allow users to interact with the world much more freely. However, designing controllers to move physically modeled creatures (e.g. to make a human character walk) is generally a difficult task. Artificial life techniques can be useful in automating this task. For example, artificial evolution can generate suitable controllers for simple behaviours, given only a high level description of that behaviour in terms of a fitness function. In this talk, the state of the art in evolving controllers, and also in evolving the creatures' body shapes, will be described and demonstrated. It will then be suggested that current approaches are unlikely to scale up to more complicated behaviours. A number of possible solutions to this problem will be discussed. The talk will conclude with some predictions of practical applications that are likely, and unlikely, to arise from artificial life research over the next 25 years.

15.15 - 15.45

Coffee

15.45 - 17.00

Applications of Usability Engineering in Video Game Research

Lucy Joyner

Usability engineering has been long established as a discipline dedicated to supporting the process of developing electronic applications, maximising ease of use and robustness for their intended use. By implementing user centred design the discipline offers developers the opportunity to assess the quality and potential success of their application from the viewpoint of intended users. When considering the process of making video games, developers need to consider not only how usable the game is, but how likely it is that intended users will be attracted to playing the game, enjoying it and purchasing the final product. Through supplementing usability engineering with cognitive and social research methodologies, we can take video game research beyond observation of behaviour, to study cognition, mood states and individual differences associated with game playing. This talk will show the complexity of the gaming situation, the beneficial applications of usability engineering, and its limitations. Ways to overcome these shortfalls will be demonstrated through the practical application of cognitive and social methodologies. Implications for game developers and the future of this research will be discussed in relation to crosscultural markets and expectations.