Visual Application within Academic Aero Engineering Teaching & Research

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ABSTRACT

Rapid developments achieved in Flight Training and Military Visual graphics fidelity have yielded cost reductions bringing this technology within the realm of fiscal possibility of academic institutions. This paper will illustrate how both teaching and research within Engineering schools and University associated Research institutes have benefitted from this improved availability.

The paper will describe how the mind set of traditionally associating Flight Simulation exclusively with Pilot Training has changed such that Aerospace/Aeronautical Engineering institutions are incorporating Flight Simulation to explore the real-world manifestation of the equations describing flight, air vehicle design and flight dynamics.

It will be shown that numerous Universities in the USA and Europe are offering aircraft design courses that incorporate Flight Simulation as a practical tool to demonstrate the results, leading to Universities, and Research Institutes demanding increased capability in terms of the air vehicles that they can Simulate and Evaluate. The paper will document how the demand for increased capability has brought a commensurate demand for increased Visual scene fidelity at an affordable price to enable the nimiety of vehicle designs and missions to be explored against real world terrains and urban environs.

The paper will also consider the expectations of millennials and subsequent generations, who will mature in an environment replete with phenomenal graphics on everyday electronics. Thus, such an advanced degree of realism will be demanded for a more “complete” immersion within pedagogical academic environments with the attendant benefit to the employing industries and research institutes.
To conclude the paper, palpable examples of benefits already experienced by academic institutions that have embraced the enhanced graphics capability will be presented. An indication of additional visual graphics and projection systems applications that will benefit the pedagogical academic environment will be included.

BIO

PRIMARY AUTHOR

Eur Ing Christopher J D Neal CEng MIMechE MRAeS has a degree in Mechanical Engineering and served an apprenticeship at Britten-Norman aircraft company, UK. Chris joined Redifon Flight Simulation, Sussex, UK, in 1977, when visual systems were moving from optic fibre and model boards with moving cameras, to CGI. Chris has seen the introduction at Redifussion of the first 180 degree collimated visual display systems (WIDE) and worked, as Project Manager, with the CAA for certification of Full Flight Simulators across the range from monitor to WIDE systems.

Chris formed Merlin Flight Simulation Group in 1995 to design and manufacture flight simulation systems specifically for academic aero engineering faculties, through which he has seen the accelerating demand within academia for the level of sophistication in visual systems, which is the subject of the proposed paper.