



QUANSER
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BRISTOL UNIVERSITY:

Advanced teaching benefits with control hardware and modeling software.

Products supplied and supported by Adept Scientific, Quanser's distributor in UK, are providing real teaching and research benefits at Bristol University. Use of a Quanser design control system is challenging students to look beyond the immediate project confines to find new solutions, whilst MapleSim modeling software is aiding post-graduate students in the development of robotic systems.

The **Quanser 3DOF Helicopter** experiment is used by Year 2 Mechanical Engineering and 3rd Year Aerospace students. This is a design challenge package that helps to guide students through the design of control systems to regulate elevation and travel. Two departments at Bristol share four helicopters with a total of 180 students working in pairs, at different times, to test the systems they have designed.

Although outside of the teaching parameters, the 3DOF Helicopters allow students to further explore control possibilities and the tuning of PID control to limit variation, seeking to avoid oscillation. Senior lecturer, Dr Guido Herrmann of the Dynamics and Control Research Group, explains some of the advantages gained by using the Quanser products:

"The 3DOF Helicopter is straightforward to use and the lessons learned are easily transferable into real-world situations." He goes on to say that the experiment allows students to work without supervision and is structured in a way that keeps them on track but provokes further exploration. **"Some**

students have gone so far as to develop algorithms to control the helicopter using optimal control design ideas, methods not taught at that early stage."

The simple nature of the experiment offers distinct advantages to lecturers, who are freed to use more time teaching, without having to worry about breakdowns or students wandering from the set work. **"Students have time to explore for themselves the tasks involved in PID control, which is taught in detail afterwards,"** continues Dr Herrmann.

At the Bristol Robotics Laboratory (BRL), the UK's largest, four postgraduates are using MapleSim to model robotic systems. Used in various projects, "MapleSim has enabled students to develop models far more quickly than would otherwise have been the case," says Dr Herrmann. Highly intuitive, the software possesses a powerful mix of

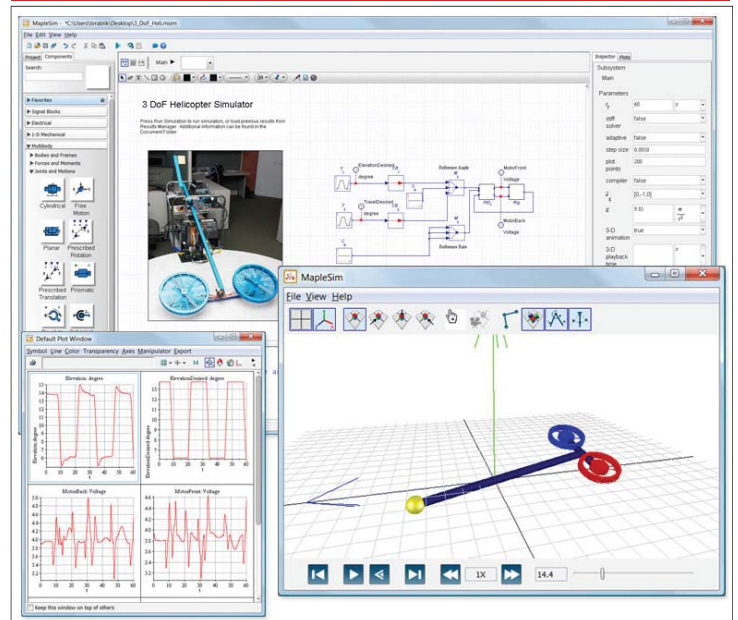
"The Quanser 3 DOF Helicopter is straightforward to use and the lessons learned are easily transferable into real-world situations."
Dr. Guido Herrmann, Senior Lecturer, Dynamics and Control Research Group, Bristol University



modeling and simulation tools to reduce the time and effort needed to realize projects whilst learning valuable techniques.

Although both the Quanser helicopter and MapleSim software are 'excellent and robust' products, Dr Herrmann recognizes the value of the relationship with Adept as a service provider, **"The staff at Adept are both knowledgeable and efficient – I have the utmost confidence in the company's ability to offer good, impartial advice and deliver products that are fit for purpose."**

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Quanser is the world leader in the design and manufacturing of advanced systems for real-time control, design and implementation used in industry, education and research. Our open-architecture control solutions are ideal for implementing and evaluating strategies from the simple to the extremely complex. Quanser control solutions are used in more than 2,500 universities and colleges, research laboratories and commercial organizations around the world.

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