

## Dr Rade Vignjevic

### Research & Teaching

Research interests are focused on finite element (FE) and meshless methods for nonlinear mechanics problems, such as collapse of thin walled beams, buckling of thin walled structures, high/hyper velocity impact on structures and in general processes with severe deformations.



The majority of research in the field of aircraft and automotive crashworthiness and, velocity impact on spacecraft and defense is industrially sponsored. The sponsoring companies include Airbus, Astrium, BAe - Systems, Westland Helicopters, Agusta, Eurocopter, Jaguar, Williams F1, British American Racing F1, QinetiQ and AWE.

Modules taught:

- Finite Element Method
- Impact Dynamics
- Rigid Body Dynamics

### Background

Academic qualifications:

- Dipl.Ing Mechanical Engineering
- MSc Applied Mechanics
- PhD Nonlinear Transient FE

Twenty years experience of lecturing and conducting research in the field of applied mechanics.

Head of the Crashworthiness, Impact & Structural Mechanics Group (CCISM) which provides expertise in development and application of simulation tools and in experimental techniques for testing of structures and materials under static and dynamic loading.

Collaboration with Los Alamos National Laboratory (LANL) in the field of meshless methods development.

## Recent Publications

1. R. Vignjevic, N. K. Bourne, J. C. F. Millett, and T. De Vuyst: Effects of Orientation on the Strength of the Aluminum Alloy 7010-T6 During Shock Loading: Experiment And Simulation, *Journal of Applied Physics*, Volume 92 - 8, pp. 4342-4349, 2002
2. R. Vignjevic, M. Meo: A New Concept of a Helicopter Sub-Floor Structure Crashworthy in Impacts on Water and Rigid Surfaces, *International Journal of Crashworthiness*, Vol. 7-3, pp 321-331, 2002
3. I. Romero, R. Vignjevic: Deployable Space Manipulator Closed-Loop Control, Ideas and Possibilities of using GPS as a sensor, *Advances in Space Research*, Vol. 30-2, pp 419-429, 2002
4. R.G. Turner, E.A. Taylor, M. McDonnell, H. Stokes, P. Marriott, J. Wilkinson, R. Vignjevic, D. Catling, L. Berthoud and M. Lambert: Cost Effective Debris Shields for Unmanned Spacecraft, *International Journal of Impact Engineering*, Vol. 28-2, pp 365-378, 2002
5. R. Vignjevic, K. Hughes, E. Taylor: Finite Element Modelling of Failure of a Multi-Material Target due to High Velocity Space Debris Impacts, *International Journal on Space Debris*, V 2, No. 3, pp 319-337, 2001
6. R. Vignjevic; T. De Vuyst, M. Gourma: Interpolation Techniques in Meshless Methods, *Computer Modelling in Engineering and Science Journal*, V 2, No. 3, pp 319-337, 2001
7. R. Vignjevic, M. Meo: Simulation of Helicopter Under-Floor Structure Impact on Water, *International Journal of Crashworthiness*, V 6, pp 425-443, July 2001
8. J. Campbell, R. Vignjevic, L. Libersky: A Contact Algorithm for Smoothed Particle Hydrodynamics, *Computer Methods in Applied Mechanics and Engineering*, Vol. 184/1, pp 49-65, 2000
9. R. Vignjevic, J. Campbell, L. Libersky: A Treatment of Zero Energy Modes in the Smoothed Particle Hydrodynamics Method, *Computer Methods in Applied Mechanics and Engineering*, Vol. 184/1, pp 67-85, March 2000