



Professor Dong Ruan

See:

<https://www.swinburne.edu.au/science-engineering-technology/staff/profile/index.php?id=druan>

https://scholar.google.com/citations?user=w_BsMVYAAAAJ&hl=en

https://www.researchgate.net/profile/Dong_Ruan2

Department of Mechanical Engineering and Product Design Engineering
Swinburne University of Technology, Hawthorn, Victoria, Australia

Biography:

Prof. Dong Ruan's research interests are: (1) characterization of the mechanical properties of various materials at high strain rates; (2) evaluation of the mechanical response of structures (such as multi-layered panels and tubes) under dynamic loadings; (3) additive manufacturing. She has published over 200 academic papers in top international journals and prestigious international conferences. Ruan has secured over \$4 million research grants from Australian Research Council (ARC), Defence Materials and Technology Centre (DMTC), Cooperative Research Centre for Advanced Automotive Technology (AutoCRC), CAST CRC and Rail Manufacturing CRC, among others. Ruan has supervised more than 20 PhD students. Some of her recent projects include:

- Mechanical properties of auxetic materials/structures fabricated by 3D printing techniques
- Dynamic properties of metamaterials produced by additive manufacturing (Multi Jet Fusion and Fused Deposition Modeling)
- Evaluation of hybrid structures for impact performance in rail applications
- Characterisation of sandwich panels subjected to impact loading
- Development and characterisation of lightweight tubular structures for automotive industry
- Crashworthiness of composite tubes
- Adiabatic shear band in metals

Ruan has been the Vice-secretary of International Society of Impact Engineering (the peak body in impact engineering) since 2016. She is also a member of Australian Chapter of International Association of Protective Structures (AU-IAPS). She has been reviewer for many leading international journals. Ruan received the 2013 Eureka Prize as a team member of DMTC's Armour Applications Program in the Safeguarding Australia category.

Selected Publications:

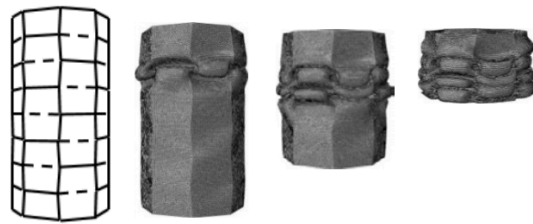


Fig. 7 Profiles of octagonal tubes at different stages of crushing process

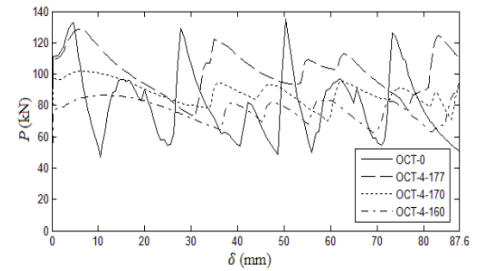


Fig. 8 Load-displacement curves of octagonal samples

From: Lu Guoxing, Rafea Dakhil Hussein and Dong Ruan, "Energy absorption in axial crushing of thin-walled tubes", The 18th Conference of Automotive Safety Technology, Suzhou, China, August 2015

D. Ruan, Guoxing Lu, F.L. Chen and Elias Siores, "Compressive behaviour of aluminium foams at low and medium strain rates", *Composite Structures*, Vol. 57, Nos. 1-4, July 2002

D. Ruan, G. Lu, F.L. Chen, and E. Siores, Compressive behaviour of aluminium foams at low and medium strain rates, *Compos. Struct.* 57 (2002), pp. 331–336.

Ruan, D., Lu, G., Wang, B., and Yu, T. X., 2003, "In-Plane Dynamic Crushing of Honeycombs - A Finite Element Study," *Int. J. Impact Eng.*, 28(2), pp. 161–182.

F. Zhu, G. Lu, D. Ruan, and D. Shu, "Tearing of metallic sandwich panels subjected to air shock loading," *Structural Engineering and Mechanics*, vol. 32, no. 2, pp. 351–370, 2009.

Feng Zhu, Guoxing Lu, Dong Ruan and Zhihua Wang, "Plastic deformation, failure and energy absorption of sandwich structures with metallic cellular cores", *International Journal of Protective Structures*, Vol. 1, No. 4, 2010

J. Shen, G. Lu, and D. Ruan, "Compressive behaviour of closed-cell aluminium foams at high strain rates," *Composites Part B: Engineering*, vol. 41, no. 8, pp. 678–685, 2010.

Shanqing Xu, John H. Beynon, Dong Ruan and Guoxing Lu, "Experimental study of the out-of-plane dynamic compression of hexagonal honeycombs", *Composite Structures*, Vol. 94, No. 8, pp 2326-2336, July 2012

S. Xu, J.H. Beynon, D. Ruan and T.X. Yu, "Strength enhancement of aluminium honeycombs caused by entrapped air under dynamic out-of-plane compression", *International Journal of Impact Engineering*, Vol. 47, pp 1-13, September 2012

Zhihua Fan, Jianhu Shen, Guoxing Lu and Dong Ruan, "Dynamic lateral crushing of empty and sandwich tubes", *International Journal of Impact Engineering*, Vol. 53, pp 3-16, March 2013

A. Ashab, Y.C. Wong, G. Lu and D. Ruan, "Indentation tests of aluminium honeycombs", *D2FAM 2013*, IOP Publishing, *Journal of Physics: Conference Series* 451, 012003, 2013

Rathnaweera G., Ruan D., Hajj M., Durandet Y., Performance of aluminium/Terocore hybrid structures in quasi-static three — point bending: Experimental and finite element analysis study, *Materials and Design* 54, 2014, 880–892

Jianhu Shen, Guoxing Lu, Dong Ruan and Chong Chiang Seah, "Lateral plastic collapse of sandwich tubes with metal foam core", *International Journal of Mechanical Sciences*, Vol. 91, pp 99-109, February 2015

M.A. Yahaya, D. Ruan, G.X. Lu, and M.S. Dargusch, Response of aluminium honeycomb sandwich panels subjected to foam projectile impact—An experimental study, *Int. J. Impact Eng.*, vol. 75, pp. 100–109, 2015.

Lu Guoxing, Rafea Dakhil Hussein and Dong Ruan, "Energy absorption in axial crushing of thin-walled tubes", *The 18th Conference of Automotive Safety Technology*, Suzhou, China, August 2015

R.D. Hussein, D. Ruan, J.W. Yoon, An Experimental study of square aluminium tubes with honeycomb core subjected to quasi-Static compressive loads, *Key Eng. Mater.*, 626 (2015), pp. 91–96

Louis N.S. Chiu, Brian G. Falzon, Dong Ruan, Shanqing Xu, Rodney S. Thomson, Bernard Chen and Wenyi Yan, "Crush responses of composite cylinder under quasi-static and dynamic loading", *Composite Structures*, Vol. 121, pp 90-98, November 2015

Rafea Dakhil Hussein, Dong Ruan, Guoxing Lu and Igor Sbarski, "Axial crushing behaviour of honeycomb-filled square carbon fiber reinforced plastic (CFRP) tubes", *Composite Structures*, Vol. 140, pp 166-179, April 2016

Hussein RD, Ruan D, Lu G. Crushing behaviour of aluminium sheet wrapped square carbon fibre reinforced plastic (CFRP) tubes. 1st International Conference on Impact Loading of Structures and Materials (ICILSM2016), Turin, Italy, 22–26 May 2016. P. 453–456.

A.S.M. Ayman Ashab, Dong Ruan, Guoxing Lu and Arafat A. Bhuiyan, Finite element analysis of aluminum honeycombs subjected to dynamic indentation and compression loads", *Materials*, Vol. 9, 162-180, 2016

Rafea Dakhil Hussein, Dong Ruan and Guoxing Lu, "Comparative research on the crushing behaviour of aluminium sheet wrapped square carbon fiber reinforced plastic (CFRP) tubes", *Key Engineering Materials*, Vol. 725, pp 83-87, December 2016

Rafea Dakhil Hussein, Dong Ruan, Guoxing Lu, Stephen Guillow and Jeong Whan Yoon, "Crushing response of square aluminium tubes filled with polyurethane foam and aluminium honeycomb", *Thin-Walled Structures*, Vol. 110, pp 140-154, January 2017

R.D. Hussein, D. Ruan, G. Lu, A. Kumar, "Cutting deformation mechanisms of square aluminium/CFRP tubes", *Key Eng Mater*, 744 (2017), pp. 317-321

Rafea Dakhil Hussein, Dong Ruan and Guoxing Lu, "Cutting and crushing of square aluminium/CFRP tubes", *Composite Structures*, Vol. 171, pp 403-418, July 2017

Jianjun Zhang, Guoxing Lu, Dong Ruan and Zhihua Wang, "Tensile behavior of an auxetic structure: Analytical modeling and finite element analysis", *International Journal of Mechanical Sciences*, 2017

Jianjun Zhang, Guoxing Lu, Zhihua Wang, Dong Ruan, Amer Alomarah and Yvonne Durandet, "Large deformation of an auxetic structure in tension: Experiments and finite element analysis", *Composite Structures*, 2017

Rafea Dakhil Hussein, Dong Ruan, Guoxing Lu and Rodney Thomson, "An energy dissipating mechanism for crushing square aluminium/CFRP tubes", *Composite Structures*, Vol. 183, pp 643-653, January 2018

Xinmei Xiang, Guoxing Lu, Zhongxian Li and Dong Ruan, "Dynamic response of monolithic and sandwich structures subjected to impulsive and impact loadings", *Advances in Structural Engineering*, Vol. 21, No. 8, pp 1134-1147, June 2018

Rafea Dakhil Hussein, Dong Ruan and Guoxing Lu, "An analytical model of square CFRP tubes subjected to axial compression", *Composites Science and Technology*, Vol. 168, pp 170-178, 10 November 2018

Tohid Mirzababaie Mostofi, Hashem Babaei, Majid Alitavoli, Guoxing Lu and Dong Ruan, "Large transverse deformation of double-layered rectangular plates subjected to gas mixture detonation load", *International Journal of Impact Engineering*, Vol. 125, pp 93-106, March 2019