



**Dr Robert Szalai**  
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### Summary

### Keywords

- Nonlinear dynamics
- structural mechanics
- time-delay systems
- mammalian hearing
- bifurcation theory numerical methods

### Expertise

- Nonlinear dynamics -Non-smooth systems -Bifurcation theory -Machine-tool vibrations -Delay equation -Mammalian hearing -Inner ear
- applied mathematics
  - mechanical engineering

### Memberships

### Organisations

[Department of Engineering Mathematics](#)

### Other sites

- [Engineering](#)

### Recent publications

- Anderson, MW, Moss, J, Szalai, R & Lane, J, 2019, '[Mathematical Modeling Highlights the Complex Role of AKT in TRAIL-Induced Apoptosis of Colorectal Carcinoma Cells](#)'. *iScience*, vol 12., pp. 182-193
- Szalai, R, 2019, '[Model Reduction of Non-densely Defined Piecewise-Smooth Systems in Banach Spaces](#)'. *Journal of Nonlinear Science*, vol 29., pp. 897-960
- Szalai, R, Ehrhardt, D & Haller, G, 2017, '[Nonlinear model identification and spectral submanifolds for multi-degree-of-freedom mechanical vibrations](#)'. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, vol 473.
- Terkovic, N, Neild, SA, Lowenberg, M, Szalai, R & Krauskopf, B, 2016, '[Substructurability: The effect of interface location on a real-time dynamic substructuring test](#)'. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, vol 472.
- Kolaric, K, Woods, S, Jung, CC, Szalai, R, McInnes, RR, Bashir, Z & Atan, D, 2016, '[The Physiological Impact of Mossy Cells on Hippocampal Dentate Gyrus](#)'. in: *FENS*.

- Kolaric, K, Ellis, C, Woods, S, Jung, CC, McInnes, RR, Szalai, R, Bashir, Z & Atan, D, 2016, ['The role of mossy cells on hippocampal-dependent learning and memory'](#). in: *Society of Neuroscience*.
- Hogan, J, Homer, M, Jeffrey, M & Szalai, R, 2016, ['Piecewise smooth dynamical systems theory: the case of the missing boundary equilibrium bifurcations'](#). *Journal of Nonlinear Science*, vol 26., pp. 1161-1173
- Berdeni, Y, Champneys, A & Szalai, R, 2015, ['The two-ball bounce problem'](#). *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, vol 471., pp. 1-20
- Szalai, R, 2014, ['Impact Mechanics of Elastic Structures With Point Contact'](#). *Journal of Vibration and Acoustics*, vol 136.
- Szalai, R & Jeffrey, MR, 2014, ['Non-deterministic dynamics of a mechanical system'](#). *Physical Review E: Statistical, Nonlinear, and Soft Matter Physics*, vol 90.

[View complete publications list](#) in the University of Bristol publications system

## **Courses**

Dr Szalai currently teaches 2 courses: