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Journal of Mechanical Engineering Science



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The Journal of Mechanical Engineering Science advances the understanding of both the fundamentals of engineering science and its application to the solution of challenges and problems in engineering. Published twelve times a year. ISSN:0954-4062 (Print); 2041-2983(Online)

EDITOR'S PICK

This section of our website highlights collections of articles which may be of interest to you. If you have a suggestion for themes you would like to see here, please contact the [Managing Editor](#).

The following published papers have been selected by Professor Matthew Cartmell, the Editor of the *Journal of Mechanical Engineering Science*, from all sections of the Journal based on their quality, novelty, rigour, and insight.

[Understanding the effect of non-conventional laser beam geometry on material processing by finite-element modelling](#)

M A Sheikh and L Li

Vol. 224, C5, DOI: 10.1243/09544062JMES1745

An interesting use of FEA to model unconventional laser beam geometries for material processing.

[An analytical model of thermal contact resistance based on the Weierstrass–Mandelbrot fractal function](#)

S Jiang and Y Zheng

Vol. 224, C4, DOI: 10.1243/09544062JMES1799

In this paper the authors combine fractal geometry with classical heat conduction theory to understand the thermal contact resistance of rough surfaces.

[Hydrogen: a future energy vector for sustainable development](#)

T K Mandal and D H Gregory

Vol. 224, C3, DOI: 10.1243/09544062JMES1774

A highly readable account of the chemistry and the technology required to develop hydrogen as a realistic and pragmatic fuel for the future.

[Dynamic analysis of multi-walled carbon nanotubes using the differential quadrature method](#)

Ming-Hung Hsu

Vol. 224, C3, DOI: 10.1243/09544062JMES1719

This paper offers a clear insight into the physics and the associated modelling challenges of carbon nanobeams.

[Singularities within the workspace of spatial parallel mechanisms with symmetric structures](#)

J-S Zhao, F Chu and Z-J Feng

Vol. 224, C2, DOI: 10.1243/09544062JMES1701

A thorough analysis of the workspace calculation for symmetrically structured parallel mechanisms and the potential for singularities in such systems.

[Study of a small-scale standing-wave thermoacoustic engine](#)

S Jung and K I Matveev

Vol. 224, C1, DOI: 10.1243/09544062JMES1594

This paper proposes a practical science-based design for an interesting thermoacoustic engine operating by means of standing waves in a resonator.

[A gaze into the crystal ball: biomimetics in the year 2059](#)

I C Gebeshuber, P Gruber and M Drack

Vol. 223, C12, DOI: 10.1243/09544062JMES1563

A fascinating forward look at the possibilities for biomimetics fifty years into the future.

[From multi-body to many-body dynamics](#)

S Theodossiades, M Teodorescu and H Rahnejat

Vol. 223, C12, DOI: 10.1243/09544062JMES1688

In this paper the authors bring together multi-body and many-body dynamics by introducing formalisms for alternative physics such as contact mechanics and boundary element theories.

[Shape-memory coaxial bimorphs](#)

R Jähne and L F Campanile

Vol. 223, C11, DOI: 10.1243/09544062JMES1779

A highly readable fast-track paper dealing with the analytically based design of co-axial bimorph elements.

[The effects of geometric offsets on the dynamic responses of a Scott–Russell amplifying mechanism with flexible hinges](#)

C-M Chen and R-F Fung

Vol. 223, C10, DOI: 10.1243/09544062JMES1357

This paper offers an analytical insight into the design of an interesting class of hinged actuators with potential application to mechanism amplification.

[Load-path-based modelling strategies for synovial joints](#)

A Yoxall, J Luxmoore and E Rodriguez-Falcon
Vol. 223, C9, DOI: 10.1243/09544062JMES1448

Novel work is presented here in biomechanics in which FEA is used as a tool for modelling human synovial joints, with wider implications for fluid-structure interaction problems.

[The computation of torsional, dynamic stresses](#)

R Whalley and A A-Ameer
Vol. 223, C8, DOI: 10.1243/09544062JMES1215

This paper offers a useful generic methodology for calculating dynamic stresses in torsional systems subjected to arbitrarily changing torque loadings.

[A new approach to the calculation of Euler work for centrifugal fan impellers](#)

J J Tan, D T Qi and T F Luo
Vol. 223, C7, DOI: 10.1243/09544062JMES1396

This technical note offers a new insight into centrifugal fan work calculations when inlet flow prewhirl is taken into account.

[The differential calculus of screws: theory, geometrical interpretation, and applications](#)

J J Cervantes-Sánchez, J M Rico-Martínez, G González-Montiel and E J González-Galván
Vol. 223, C6, DOI: 10.1243/09544062JMES1195

In this paper an authoritative appraisal of the Lie-group based differential calculus of screws is given, with examples for applications in serial manipulator kinematics.

[Theoretical analysis of internal epitrochoidal and hypotrochoidal machines](#)

G Bonandrini, G Mimmi and C Rottenbacher
Vol. 223, C6, DOI: 10.1243/09544062JMES1163

Epitrochoidal and hypotrochoidal machines are examples of practical applications for trochoidal rotor profiles as used in pumps, compressors and engines. This paper provides a new and novel scientific treatment for such machines.

[The geyser as a self-oscillatory system. Randomness or dynamical chaos?](#)

P Landa and D Vlasov

Vol. 223, C5, DOI: 10.1243/09544062JMES1089

An interesting alternative perspective on the natural geyser which considers it as a self-oscillatory system and suggests that random ejections are conditioned by the randomness within the boiling process, rather than as manifestations of chaotic dynamics.

[Crack tip stress intensity factors for a crack emanating from a semi-infinite notch with application to the avoidance of fatigue in complete contacts](#)

A G Philipps, S Karuppanan, N Banerjee and D A Hills

Vol. 223, C4, DOI: 10.1243/09544062JMES1178

An insightful and succinct treatment of crack tip stress intensity factors with application to complete contact problems.

[Design equations for binary shape memory actuators under dissipative forces](#)

I Spinella and E Dragoni

Vol. 223, C3, DOI: 10.1243/09544062JMES1232

The design of shape memory actuators is complex and application specific; this paper offers an extremely clear and insightful strategy for designing binary shape actuators.

[Building Bayesian network classifiers through a Bayesian complexity monitoring system](#)

G A Ruz and D T Pham

Vol. 223, C3, DOI: 10.1243/09544062JMES1243

This paper provides a rigorous treatment of Bayesian network classifiers for machine learning

[Analysis of non-linear vibrations of a microresonator under piezoelectric and electrostatic actuations](#)

M Zamanian, S E Khadem, S N Mahmoodi

Vol. 223, issue C2, DOI: 10.1243/09544062JMES1147

An analytically interesting paper dealing with the nonlinear dynamics of a microresonator comprising a microbeam and a deposited piezo patch.

Prize-winning and highly commended papers in 2010

The PE Publishing Best Paper Prize for the papers published in the *Journal of Mechanical Engineering Science* in 2009 has been awarded to C J Lawn for his paper entitled [Technologies for tomorrow's electric power generation](#),

Vol. 223, issue C12. DOI:10.1243/09544062JMES1512.

The following papers published in 2009 volume were highly commended by the Editorial Board of the *Journal of Mechanical Engineering Science* :

[Combustion and the design of future engine fuels](#)

by D Bradley.

Vol. 223, issue C12. DOI: 10.1243/09544062JMES1519.

[Some aspects of gear tribology](#)

by R W Snidle and H P Evans.

Vol. 223, issue C1. DOI: 10.1243/09544062JMES1168.

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