



Dr Joe Rooney
Faculty of Mathematics, Computing and Technology
The Open University
Walton Hall
Milton Keynes
MK7 6AA
United Kingdom
j.rooney@open.ac.uk

DOB: 17/09/1949

#### HIGHER EDUCATION

#### **Degrees**

1967-70 BSc (Hons), University of Sussex, Falmer, UK.

(Mathematics/Physics)

1970-74 PhD, John Moores University, Liverpool, UK,

(Kinematics: 'A unified theory for the analysis of spatial mechanisms based on dual

numbers and spherical trigonometry').

1995-97 MSc University of London, UK,

(Astrophysics: 'An investigation of the kinematic geometry of the Kerr metric using

generalised complex and hypercomplex numbers').

#### **Professional Qualifications**

1974 AFIMA (Associate Fellow of the Institute of Mathematics and its Applications).

#### APPOINTMENTS AND EXPERIENCE

1979-	Academic and Course Team Chair, The Open University, Milton Keynes, UK.
1978-79	Post Doctoral Research Fellow, The Open University, Milton Keynes, UK.
1975-78	Post Doctoral Research Fellow, Cranfield University, Cranfield, UK.
1974-75	Assistant Professor, University of Florida, Gainesville, Florida, USA.
1970-74	Research Assistant, John Moores University, Liverpool, UK.
1970-70	Actuarial Trainee, Royal Insurance Group, Liverpool, UK.

### **UNIVERSITY TEACHING AND STUDENT SUPPORT**

#### **Courses Taught at The Open University**

(Rôles: Chair, Author, Editor, TV Presenter, Examiner, Marker, Tutor, Demonstrator, Monitor) (Course codes: ' $M \sim$  'Maths', ' $T \sim$  'Technology', ' $S \sim$  'Science', ' $P \sim$  'Postgraduate', ' $U \sim$  'University')

T191: Personal and Career Development MT365: Graphs, Networks and Design

MT264: Designing applications with Visual Basic

T207: The Engineer as Problem Solver

T307: Innovation: Designing for a Sustainable Future

T288: Robotic Autonomous Systems

T208: Autonomous Systems: Design Principles

T395 (and TZS395-Singapore): Mechatronics: Designing Intelligent Machines

MU120: Open Mathematics T363: Computer Aided Design PT616: Computer-aided Engineering

TM361: Graphs, Networks and Design

M336: Groups and Geometry

T264: Design: Principles and Practice TM282: Modelling with Mathematics T402: Open Technology Project T401: Technology Project

T392: Engineering Product Design

T281: Basic Physical Science for Technology T331: Engineering Mechanics: Solids and Fluids

T232: Engineering Mechanics: Solids TS251: An Introduction to Materials

T801: MSc in Manufacturing Management Technology

T102: Living with Technology T100: The Man-Made World





#### **Courses Taught at Other Institutions**

Cranfield University
Engineering Mechanics
Spatial Mechanisms
University of Florida
Differential Equations
Algebraic Curves
John Moores University
Mathematics

#### **ADMINISTRATION AND MANAGEMENT**

#### **The Open University**

2007-	MCT Faculty Academic Conduct Officer
2006-	MCT Faculty Library Representative
1980-2004	Member of Department of Design and Innovation Committee
1999–2002	Member of Technology Faculty Research Student Mentoring Group
	Mentor for Research Students in Design and EERU
2000–2002	Design Representative on Technology Research Board
2000–2002	Member of Technology Research Funding Committee
1999-2001	RAE Coordinator for UoA64 Art and Design
1999–2000	Design Representative on Technology Faculty Research Committee
1999–2000	Member of Technology Faculty Research Funding Sub-Committee

#### **RESEARCH AND SCHOLARSHIP**

#### **Interests**

Current research interests relate to the kinematic, dynamic and geometric design of robots and other multi-body systems. The focus is on geometric algebras (Clifford algebras), mathematical screw theory and various types of (non-Euclidean) geometries for the design of kinematic systems, variable-geometry mechanical structures and mechanisms, and robust mobile planetary and space robot systems.

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HEFCE Project Capital Allocation Project,	£146,372
OU Strategic Research Initiative Project,	£50,000
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	£20,000
•	220,000
·	£2,386
	,_,
	£2,500
	,
SERC Project,	£40,339
'The construction and evaluation of new robot gripper designs'	
OU Research Committee Grant,	£1,480
'The kinematic interaction of co-operating robot manipulators'	
OU Research Committee Project,	£10,891
A computer-aided investigation of new robot manipulator designs	
SRC Project,	£20,533
	nd
	£550
	£27,000
	£3,100
'Robotics equipment'	
	HEFCE Project Capital Allocation Project, 'Laboratory Facility for Robotic Autonomous Systems' OU Strategic Research Initiative Project, 'Kinematic design of manipulation and locomotion sub-systems for reconfigurable autonomous robots' British National Space Centre/OU Project, 'Spatial and temporal aspects of robot behaviour' Technology Faculty Project, 'Kinematic and structural designs for the Beagle2 Mars lander manipulator arm' Technology Faculty Project, 'The computer-aided design of precision robot manipulators' SERC Project, 'The construction and evaluation of new robot gripper designs' OU Research Committee Grant, 'The kinematic interaction of co-operating robot manipulators' OU Research Committee Project, A computer-aided investigation of new robot manipulator designs





#### POSTGRADUATE STUDENT ADVISOR/SUPERVISOR

1997-2007 The Open University

PhD Thesis Supervisor

1997-2000 University of Florida

PhD Thesis Advisor

1975 - 1977Cranfield Institute of Technology

MSc Dissertation Supervisor

University of Florida 1974 - 1975

PhD Thesis Advisor

MSc Dissertation Supervisor

#### **EXTERNAL ACADEMIC ACTIVITIES**

#### Membership or Offices held

2011-Member of Nominating Committee for the Executive Council of IFToMM

2004-2011 Treasurer and Executive Council Officer for IFToMM

2009 Member of Conference Programme Committee for Computational Kinematics (CK2009),

University of Duisberg-Essen, Germany

Member of Conference Scientific Committee for Reconfigurable Mechanisms and Robots 2009

(ReMAR 2009), King's College, London

2011-2012 Member of Conference Scientific Committee for Mechanism Design for Robotics, Beihang

University, Beijing, China

2011-Associate Editor for open access Journal in Mechanical Sciences

#### **External Examining (PhD Examiner)**

2011 King's College London 2003 University of Durham

2003 University of Newcastle-upon-Tyne

University of Salford 1997

University of Newcastle-upon-Tyne 1988 1988 Loughborough University of Technology 1987 Loughborough University of Technology

1984 University of Edinburgh 1975 University of Florida

#### **Academic Editorial Work**

1979 Guest Editor for a Special Issue on 'Kinematic Structure'

Environment and Planning B, Vol 6, No. 4, 1979,

#### **Contributions to Conferences**

2011-2012 Member of the Scientific Committee for the Symposium on Mechanism Design for Robotics

held at Beihang University in Beijing, China

2009 Member of the Scientific Committee for the Reconfigurable Mechanisms and Robots

(ReMAR2009) conference at King's College, London

2009 Member of the Programme Committee for the Computational Kinematics (CK2009)

conference at University of Duisburg-Essen, Germany

#### **Invited/Keynote Lectures**

Keynote Speaker at International Olympiad on Mechanism and Machine Science, Izhevsk 2011

State Technical University, Izhevsk, Russia, April 19-21, 'Some Geometries and Algebras

for Application in Robotics'

Keynote Speaker at International Symposium on Mechanism Design for Robotics at Pan-2010

American University, México City, México, September 28-29, 'A Brief Overview of

Geometries and Algebras for Robotics'

#### **PUBLICATIONS**

#### **Edited Books**

Rooney J, Steadman J P (eds.) (1987)

### Principles of Computer-aided Design,

Pitman/Open University, London, 341 pp; ISBN: 0 273 02672 0

Rooney J, Steadman J P (eds.) (1988)

#### Principles of Computer-aided Design,

Prentice Hall, New Jersey (US Edition) ,341 pp; ISBN: 0-13-709346-2 025





Rooney J, Steadman J P (Hrsg.) (1990)

**CAD: Grundlagen von Computer Aided Design** 

R Oldenbourg Verlag, München (German Edition), 453 pp; ISBN: 3-486-20706-7

Rooney J, Steadman J P (eds.) (1990)

Principles of Computer-aided Design,

Affiliated East-West Press, New Delhi (Indian Edition), 341 pp; ISBN: 81-85336-32-6

Clarke J A, Maver T W (Eds.), Rooney J (Sub-Ed.) (1992)

Dictionary of Computer Aided Design: The CAD Reference Guide,

Butterworth/Heinemann, London 1992, (78 entries), ISBN: 408051876

#### Chapters in Books

'A Dirac Model for Double Cover Representations of Robot Manipulator Platform Rotation' in A Takanishi, Y Nakamura and B Heimann (Eds.) (2008) **RoManSy 17: Robot Design**,

Dynamics, and Control, CISM, Udine, pp 493-503, ISBN: 978 4 906685 44 8

'Multivectors and Quaternions in Rigid Body Rotation: Clifford vs Hamilton'

in J-P Merlet and M Dahan (Eds.) (2007) **Proceedings of the 12th World Congress in Mechanism and Machine Science**, June 17-21, Besancon, France, on CD ROM

'William Kingdon Clifford (1845-1879)'

in M. Ceccarelli (Ed.) (2007), **Distinguished Figures in Mechanism and Machine Science**, Springer, Dordrecht, pp 77-114, ISBN: 978-1-4020-6365-7

'Geometric Configuration in Robot Kinematic Design'

in T. Zielińska and C. Zieliński (Eds.) (2006) **RoManSy 16: Robot Design, Dynamics, and Control**, Springer, Dordrecht, pp 55-62, ISBN: 3 211 36064 6

'Kinematic Structure for Robust Mechanical Architectures in Robotic Planetary Exploration' in T S Bowling (Ed.) (2002) **Dynamics and Control of Systems and Structures in Space**,

Cranfield University Press, pp 301-308, ISBN: 1 871315 79 4, (with J D Hobbs)

'Pose, Posture, Formation and Contortion in Kinematic Systems'

in G Bianchi, J-C Guinot and C Rzymkowski (Eds.) (2002) RoManSy 14: Theory and Practice of

**Robots and Manipulators**, Springer, Dordrecht, pp 77-86, ISBN: 3 211 83691 8, (with T K Tanev) 'Rotation Symmetry Axes and the Quality Index in a 3D Octahedral Parallel Robot Manipulator System'

in J Lenarčič and F Thomas (Eds.) (2002) **Advances in Robot Kinematics: Theory and Applications**, Kluwer Academic, pp 29-38, ISBN: 1 4020 0696 9, (with T K Tanev)

'Introduction'

in J Rooney and J P Steadman (Eds.) (1987), **Principles of Computer-aided Design**,

Pitman/Open University, London, pp 1-11, ISBN: 0 273 02672 0

'Representing Objects'

in J Rooney and J P Steadman (Eds.) (1987), **Principles of Computer-aided Design**, Pitman/Open University, London, pp 13-37, ISBN: 0 273 02672 0

'Wire-frame Modelling'

in J Rooney and J P Steadman (Eds.) (1987), **Principles of Computer-aided Design**, Pitman/Open University, London, pp 95-105, ISBN: 0 273 02672 0

'Geometry in Motion'

in J Rooney and J P Steadman (Eds.) (1987), **Principles of Computer-aided Design** Pitman/Open University, London, pp 285-295, ISBN: 0 273 02672 0

'Kinematic and Geometric Structure in Robot Systems'

in T O'Shea and M Eisenstadt (Eds.) (1984), **Artificial Intelligence: Tools, Techniques, and Applications**, Harper & Row, New York, pp 192-244, ISBN: 0-06-041894-X

'Manipulator Postures and Kinematic Assembly Configurations'

in J S Rao and K N Gupta (Eds.) (1984), **Proceedings of the Sixth World Congress of the International Federation for the Theory of Machines and Mechanisms**, Wiley Eastern, New Delhi, pp 1014-1020, ISBN: 0 85226 781 9, (with C F Earl)

'The Generation of Kinematic Structures for Planar Kinematic Chains'

in J S Rao and K N Gupta (Eds.) (1984) **Proceedings of the Sixth World Congress of the International Federation for the Theory of Machines and Mechanisms**, Wiley Eastern, New Delhi, pp 133-136, ISBN: 0 85226 781 9, (with C F Earl)

'The Mobility of a Graph'

in (1984) **Proceedings of the First Southeast Asian Graph Theory Colloquium**, Springer-Verlag, pp 135-149, (with R J Wilson)

'On the Principle of Transference'

in (1975) Proceedings of the 4th World Congress of the International Federation for the Theory of Machines and Mechanisms, Institution of Mechanical Engineers, pp 1089-1094





'On Obtaining the Velocity Motor of any Link in a General n-link Spatial Manipulator' in (1975) **Proceedings of the Fourth World Congress of the International Federation for the Theory of Machines and Mechanisms**, Institution of Mechanical Engineers, pp 1083-1088

#### **Papers in Refereed Journals**

'Rotations of  $4n\pi$  and the Kinematic Design of Parallel Manipulators'.

The Open Mechanical Engineering Journal, 2010, 4, 86-92, Bentham Open, ISSN: 1874-155X/10 'Contortion and Formation Structures in the Mappings between Robotic Jointspaces and Workspaces', Journal of Robotic Systems, Vol 20, No 7, July 2003, pp 341-353, Wiley, ISSN: 0741 2223, (with T

'A Review of a Family of Self-Deploying Tensegrity Structures with Elastic Ties',

The Shock and Vibration Digest, Vol. 32, No.2, March, 2000, pp 100-106, Sage Science, ISSN: 0583 1024, (with J Duffy, B Knight and C Crane)

'Reuleaux Pairs and Surfaces that cannot be Gripped',

International Journal of Robotics Research, 8, No. 5, October, 1989, pp 79-87, Sage, ISSN: 0278 3649, (with J M Selig)

'Some Kinematic Structures for Robot Manipulator Designs',

Transactions of the American Society of Mechanical Engineers, Journal of Mechanisms, Transmissions, and Automation in Design, **105**, No.1, March, 1983, pp 15-22, ASME, (with C F Earl)

'On the Relationship between Rotations and Lorentz Transformations in Two, Three and Four Dimensions', *Environment and Planning B*, **6**, 1979, pp 413-439, Pion

'On the Three Types of Complex Number and Planar Transformations',

Environment and Planning B, 5, 1978, pp 89-99, Pion

'A Comparison of Representations of General Spatial Screw Displacement', Environment and Planning B, 5, 1978, pp 45-88, Pion

'A Survey of Representations of Spatial Rotation about a Fixed Point',

Environment and Planning B, 4, 1977, pp 185-210, Pion

'A Foundation for a Unified Theory of Analysis of Spatial Mechanisms',

Transactions of the American Society of Mechanical Engineers, Series B. Journal of Engineering for Industry, **97**, No.4, November, 1975, pp 1159-1165, ASME, (with J Duffy)

'Displacement Analysis of Spatial Six-Link 5R-C Mechanisms',

Transactions of the American Society of Mechanical Engineers, Series E. Journal of Applied Mechanics, **41**, No.3, September, 1974, pp 759-766, ASME, (with J Duffy)

'A Displacement Analysis of Spatial Six-Link 4R-P-C Mechanisms, Part 1: Analysis of RCRPRR Mechanism'.

Transactions of the American Society of Mechanical Engineers, Series B. Journal of Engineering for Industry, **96**, No.3, August, 1974, pp 705-712, ASME, (with J Duffy)

'A Displacement Analysis of Spatial Six-Link 4R-P-C Mechanisms", Part 2: Derivation of Input-Output Displacement Equation for RCRRPR Mechanism',

Transactions of the American Society of Mechanical Engineers, Series B. Journal of Engineering for Industry, **96**, No.3, August, 1974, pp 713-717, ASME, (with J Duffy)

"A Displacement Analysis of Spatial Six-Link 4R-P-C Mechanisms, Part 3: Derivation of Input-Output Displacement Equation for RRRPCR Mechanism",

Transactions of the American Society of Mechanical Engineers, Series B. Journal of Engineering for Industry, **96**, No.3, August, 1974, pp 718-721, ASME, (with J Duffy)

'Notes on the Development of a Unified Theory for the Analysis of Spatial Mechanisms based on Spherical Trigonometry",

Advances in Mechanisms, 1973, Cranfield University, (with J Duffy)

## Papers in Refereed Conferences

'Aspects of Clifford Algebra for Screw Theory',

5th International Workshop on Computational Kinematics CK2009, University of Duisburg-Essen, Germany, May 6-8, 2009

'Representing and Analysing the Kinematic Robustness of Robotic Planetary Systems',

10th ESA Workshop on Advanced Space Technologies for Robotics and Automation ASTRA2008, ESA/ESTEC, Noordwijk, Netherlands, November 11-13, 2008, (with J D Hobbs)

'On the Different Forms of Algebraic Eliminant',

International Workshop on Computational Kinematics CK2005, University of Cassino, Italy, May 4-6, 2005





'An Initial Investigation into the Geometrical Meaning of the (Pseudo-) Inverses of the Line Matrices for the Edges of Platonic Polyhedra',

*Ball 2000 Symposium*, University of Cambridge, UK, July 9-11, 2000, (with J H Lee and J Duffy) 'Innovative Deployable Antenna Developments using Tensegrity Design'.

41st AIAA Structures Conference, Atlanta, USA, April 3-6, 2000, (with B F Knight, J Duffy, and C D Crane III)

'Tensegrity and Compegrity Configurations in Anti-Prism Manipulator Platforms',

10th World Congress on the Theory of Machines and Mechanisms, University of Oulu, Finland, June 20-24, 1999, (with J Duffy and J H Lee)

'An Analysis of the Deployment of Tensegrity Structures using Screw Theory', IUTAM-IASS, Symposium on Deployable Structures: Theory and Applications, University of Cambridge, UK, September 6-9, 1998, (with J Duffy, B Knight, and C Crane)

'The Spherical Geometry of Rotation Half-Angles and Quaternion n-ary Products',

RoManSy 98, 12th CISM-IFToMM Symposium on Theory and Practice of Robots and Manipulators, Paris, France, July 6-9, 1998

'An Investigation of some Special Motions of an Octahedron Manipulator using Screw Theory', Florida Conference on Recent Advances in Robotics, Melbourne, Florida, USA, March 26-27, 1998, (with J Duffy, B Knight, and C Crane)

'Precision in Robot Manipulators',

ICARCV '92, 2nd International Conference on Automation, Robotics and Computer Vision, Singapore, September 15-18, 1992

'Micro-Robots and Macro-Robots: The Inner and Outer Limits of Robot Design',

ICARCV '92, 2nd International Conference on Automation, Robotics and Computer Vision, Singapore, September 15-18, 1992

'Manipulator Postures and Kinematic Assembly Configurations',

6th World Congress of the International Federation for the Theory of Machines and Mechanisms, New Delhi, India, December 15-20, 1983, (with C F Earl)

'The Generation of Kinematic Structures for Planar Kinematic Chains',

6th World Congress of the International Federation for the Theory of Machines and Mechanisms, New Delhi, India, December 15-20, 1983, (with C F Earl)

'The Mobility of a Graph',

1st Southeast Asian Graph Theory Colloquium, Singapore, May 10-28, 1983, (with R J Wilson) 'Some Kinematic Structures for Robot Manipulator Designs',

17th ASME Mechanisms Conference, Washington DC, USA, September 12-15, 1982, (with C F Farl)

'Line Configurations Associated with Spatial Manipulator and Gripper Systems',

17th ASME Mechanisms Conference, Washington DC, USA, September 12-15, 1982, (with C F Earl)

'On the Principle of Transference',

4th World Congress of the International Federation for the Theory of Machines and Mechanisms, Newcastle-upon-Tyne, UK, September 8-13, 1975

'A Foundation for a Unified Theory of Analysis of Spatial Mechanisms',

13th ASME Mechanisms Conference, New York, USA, October 6-10, 1974, (with J Duffy)

'On the Closures of Spatial Mechanisms',

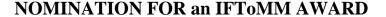
12th ASME Mechanisms Conference, San Francisco, USA, October 8-12, 1972, (with J Duffy)

#### **Papers in Other Conferences**

'An Autonomous Moving Landscape',

Greenwich 2000 - Digital Creativity, Greenwich, UK, January 13-15, 2000, (with P Margerison, and G Bellis)







Name of Honor or Award: Dedicated Service

Date submitted: September 30, 2013

Full Name of Nominee: Dr Joe Rooney

Nominee's Title/Position: Nominee's Address:

Walton Hall, Milton Keynes
MK7 6AA United Kingdom
j.rooney@open.ac.uk

Nominee's Citizenship:

British

4 Citation:

(35-40 word summary of nominee's qualifications)

In addition to his outstanding scientific activity as documented by significant publications, Dr. Rooney has contributed significantly to IFToMM as Treasurer and Executive Council Officer from 2004-2011.

Associate Professor
Faculty of Mathematics,

Computing and Technology
The Open University

5 Nominator(s):

(Names, IFToMM affiliation/ connection of the person or persons suggesting the nomination)

Carlos S. López-Cajún,

Past IFToMM Secretary General (2008-2011)

6 References:

(Names and addresses of the individuals – at least three – acquainted with the nominee's qualifications and requirements of the award who have written the attached letters. Please be advised that the Executive Council will

consider

more than five reference letters. It is the responsibility of the nominator to

obtain all references and to append them to the nomination.)

Professor Jian S Dai

Chair in Mechanisms and Robotics Head of Centre for Mechatronics and Manufacturing Systems,

Manufacturing Systems University of London, Jian.Dai@KCL.ac.uk

Professor Tian Huang(黄田)

School of Mechanical Engineering 92 Weijin Road, Nankai District Tianjin 300072, China, tianhuang@tju.edu.cn

Prof. Veniamin Goldfarb

IFToMM Vice-President, Director of Institute of Mechanics, Izhevsk State Technical University e-mail:

veniamingoldfarb@yahoo.com



#### **Professor Jian S Dai**

Chair in Mechanisms and Robotics Head of Centre for Mechatronics and Manufacturing Systems

ASME Fellow, IMechE Fellow King's College London Strand, London WC2R 2LS Tel: 020 7848 2321 Fax: 020 7848 2932 Email: Jian.Dai@KCL.ac.uk



**University of London** 

29 July 2013

**IFToMM Awards Committee** 

Dear Award Selection Committee:

## <u>Dr Joe Rooney:</u> IFToMM Dedicated Service Award

I have great pleasure in recommending Dr Joe Rooney for the **IFToMM Dedicated Service Award**. Dr Rooney was the treasurer and executive council officer of IFToMM for eight years and is currently a member of nominating committee for the executive council of IFToMM. Dr Rooney devoted himself to IFToMM service and kept IFToMM on a stable foundation financially as its treasurer for a long period.

Dr Rooney has been extremely enthusiastic and made a great contribution to the service and promotion of mechanism and machine science. During his term, he helped bring up the service of IFToMM and shore up the finance of IFToMM to a healthy finance situation. His period as the treasurer and the executive council officer contributed greatly to the service of IFToMM and to three IFToMM world congresses held in 2004, 2007 and 2011.

In the wider academic community, Dr Rooney contributed to many conferences and journals for over thirty years by serving as associate editor for journals in mechanical engineering sciences and in scientific committees of several prestigious international conferences. He established his excellent links with professionals in China, UK, Europe and USA, and promoted the research with many institutions.

Dr Rooney has wide research interest. His work on screw theory, on group theory and on Clifford algebra, has inspired many researchers worldwide. He also dedicated himself to the history of theory development and to the mathematical development in the mechanism community. His work on engineering design and innovation has been cited by many researchers and contributed greatly to the foundation of mechanism theory. With his outstanding research and excellent achievements, he published numerous important publications including well-recognised books. Many of his papers were constantly referenced by researchers across the world. His fruitful results from fundamental research and creative work made him successful in taking his ideas and theories to integrate geometry with kinematic motion. His contribution made his name linked to the theoretical development of the design theory and mathematical foundation of mechanisms and robotics.



Dr Rooney has established himself worldwide as a true, dedicated and creative scientist in mathematics and engineering. He is a creative and internationally outstanding professional, a pioneer in mechanisms and engineering design.



Dr Joe Rooney's contributions to IFToMM in his capacity as a treasurer and member of the executive council and distinguished work in engineering won him international reputation and presented him an excellent position to receive the Award. In view of his excellent work and unique contribution to the engineering and science society and the organization, I have no hesitation in recommending Dr Joe Rooney for **IFToMM Dedicated Service Award**.

I will be glad to provide further input should you request.

Yours Faithfully,

 $Jian\ S\ Dai,$  CEng, ASME Fellow, IMechE Fellow Chair in Mechanisms and Robotics



#### **Professor Jian S Dai**

Chair in Mechanisms and Robotics Head of Centre for Mechatronics and Manufacturing Systems

ASME Fellow, IMechE Fellow King's College London Strand, London WC2R 2LS Tel: 020 7848 2321 Fax: 020 7848 2932 Email: Jian.Dai@KCL.ac.uk



**University of London** 

29 July 2013

**IFToMM Awards Committee** 

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In the wider academic community, Dr Rooney contributed to many conferences and journals for over thirty years by serving as associate editor for journals in mechanical engineering sciences and in scientific committees of several prestigious international conferences. He established his excellent links with professionals in China, UK, Europe and USA, and promoted the research with many institutions.

Dr Rooney has wide research interest. His work on screw theory, on group theory and on Clifford algebra, has inspired many researchers worldwide. He also dedicated himself to the history of theory development and to the mathematical development in the mechanism community. His work on engineering design and innovation has been cited by many researchers and contributed greatly to the foundation of mechanism theory. With his outstanding research and excellent achievements, he published numerous important publications including well-recognised books. Many of his papers were constantly referenced by researchers across the world. His fruitful results from fundamental research and creative work made him successful in taking his ideas and theories to integrate geometry with kinematic motion. His contribution made his name linked to the theoretical development of the design theory and mathematical foundation of mechanisms and robotics.



Dr Rooney has established himself worldwide as a true, dedicated and creative scientist in mathematics and engineering. He is a creative and internationally outstanding professional, a pioneer in mechanisms and engineering design.



Dr Joe Rooney's contributions to IFToMM in his capacity as a treasurer and member of the executive council and distinguished work in engineering won him international reputation and presented him an excellent position to receive the Award. In view of his excellent work and unique contribution to the engineering and science society and the organization, I have no hesitation in recommending Dr Joe Rooney for **IFToMM Dedicated Service Award**.

I will be glad to provide further input should you request.

Yours Faithfully,

 $Jian\ S\ Dai,$  CEng, ASME Fellow, IMechE Fellow Chair in Mechanisms and Robotics







Re: Prof. J. Rooney IFToMM Dedicated Service Award

I respectfully submit my support to the IFToMM Dedicated Service Award to Prof. Joe Rooney.

It has been an honor to have served with him as a member of IFToMM Executive Council.

He did a very responsible duty of IFToMM Treasurer for 8 years (two terms).

I know prof. Rooney also as a well-known scientist, who's research interests and results relating to kinematics, dynamics and geometric design of robots, and other multi-body systems. His contribution to the MMS and IFToMM development is commendable.

Please, accept this letter as my petition for rewarding Prof. Rooney with the IFToMM Award.

Prof. Veniamin Goldfarb

IFToMM Vice-President,

Director of Institute of Mechanics,

Izhevsk State Technical University

e-mail: veniamingoldfarb@yahoo.com





## Nomination for an IFToMM Award

Name of Honor or Award: Dedicated Service Award
Date submitted: August 3, 2013

Full Name of Nominee: Carlos Lopez Cajun

Nominee's Title/Position: Professor at the Universidad Autónoma de Querétaro, Querétaro, Mexico.

Nominee's Address: School of Engineering, Universidad Autónoma de Querétaro, Querétaro, Mexico .

Nominee's Citizenship: Mexican

Citation: Next to his important technical contributions to MMS professor Lopez Cajun has been very active in IFToMM for years. His involvement was outstanding. In particular his membership of IFToMM's Executive Council (8 years of which 4 years as secretary) and in the organization of the 13th IFToMM World Congress in Mexico were of the utmost importance.

Nominator: Teun Koetsier, Associate professor, Department of Mathematics, VU

University, Amsterdam, The Netherlands, E-mail: <a href="mailto:t.koetsier@vu.nl">t.koetsier@vu.nl</a>

(Past president fo IFToMM's Permanent Commission for History, Past secretary for Honors and Awards)

#### References:

- 1. Professor Jorge Angeles, FRSC, James McGill Professor of Mechanical Engineering, McGill, Montreal, Canada (Honorary member of IFToMM)
- 2. Professor Fernando Viadero-Rueda, Professor of Mechanical Engineering, Universidad de Cantabria, Spain
- 3. Dr. Hanfried Kerle, Emeritus of Braunschweig Technological University, Germany (Past president of IFToMM's Permanent Commission for History)





## **Crucial qualifications:**

- Member of IFToMM"s Mexican Committee on MMS (1990-1994)
- Chair of IFToMM"s Mexican Committee on MMS (1994- 2002)
  - Member of EC of IFToMM (2003-2007)
    - Secretary of EC (2007-2011)
  - In all his functions he performed in an outstanding way

Brief biography: See the attached CV





Department of Mechanical Engineering 817 Sherbrooke Street West Montreal, QC, Canada H3A 0C3 Fax No.: (514) 398-7365

August 2nd, 2013

Prof. Marian Wiercigroch The University of Aberdeen King's College Aberdeen AB24 3FX United Kingdom

Re: Letter of Support for Prof. Carlos S. López-Cajún's nomination

Dear colleague Wiercigroch:

I have learned with great enthusiasm that Prof. Teun Koetsier is nominating our colleague Carlos S. López-Cajún to the IFToMM Dedicated Service Award. The purpose of this letter is to express my unqualified support to this nomination. I expand below on why I believe Prof. López-Cajún is extremely well positioned to receive this award.

The nominee's commitment to IFToMM spans several decades, first as a member of the Mexican Committee affiliated to IFToMM, then as its Chair, from 1994 to 2002. Shortly after Prof. López-Cajún stepped down as Chair of the Mexican Committee, he started a four-year term as Member of IFToMM's Executive Council, then continued, for four more years as its Secretary General. During the two terms in which the nominee served in the Executive Council, IFToMM saw a substantial growth in its activities, while keeping its established events, like the various conferences and workshops around the world. This remarkable activity displayed by IFToMM is the result of the coordinated work of many individuals working in different Member Organizations, but they need coordination. Here is where the role of the Executive Council becomes crucial. Professor López-Cajún played a key role in promoting and coordinating the efforts of the Executive Council and of IFToMM as a whole, which culminated with the organization of the IFToMM World Congress in 2011 in Guanajuato, a major cultural centre in Mexico and also geographically close to López-Cajún's residence, Querétaro.

The securing of Guanajuato as the venue for the 13th World Congress in Mechanism and Machine Science owes its success to the intensive and effective work displayed by the nominee both within Mexico and within the Executive Council. All in all, I have no hesitation whatsoever to state that Prof. López-Cajún is a genuine and dedicated IFToMM man, who deserves the IFToMM Dedicated Service Award. I remain

Yours sincerely

Jorge Angeles, FRSC, James McGill Professor of

Mechanical Engineering





Prof. Teun Koetsier IFToMM Secretary for Awards and Honors

Department of Mathematics Faculty of Science, Vrije Universiteit De Boelelaan 1081 NL-1081HV Amsterdam, The Netherlands

Santander, July 23rd, 2013

Dear Prof. Koetsier,

Professor Carlos S. López-Cajún is a person with extensive experience in research and teaching. He has been involved since 1976 in the teaching of Mechanics of Machinery and Mechanisms courses at the Universidad Nacional Autónoma de Mexico (UNAM). From 1996 he has taught, besides, courses in mechanical vibrations, machine design and Robotics at the School of Engineering at Universidad Autónoma de Querétaro in Mexico. His research interests cover aspects of Mechanism and Machine Science and Robotic Mechanical Systems. Specific subjects of his interest are Mechanisms Design, Parallel Manipulators, and History of MMS. On these areas he has published several research papers in indexed international journals and chapters of books, and he has sent communications to numerous international conferences. He is co-author of "Optimization of Cam Mechanisms", book published by Kluwer AP, and translated to Japanese, and "Mecanismos", published in Spanish. He has been Associate Editor for the Mechanism and Machine Theory Journal, and he has served as reviewer for several international conferences and journals.

Professor López-Cajún has been very active in the last two decades in IFtoMM activities. From 1994 to 2002 he was Chairman of the Mexican-IFToMM Commission. In 1996 he collaborated in the creation of the IFToMM-TC on Transportation Machinery. From 2004 to 2007 he was a Member of the IFToMM Executive Council (EC) and from 2008-2011 he was Secretary General of the IFToMM EC. In 2011 he participated in the organization of the 13th World Congress held in Guanajuato, México.





He is member of the Academy of Engineering of Mexico, and was a Founder Member of the Mexican Society of Mechanical Engineering. At he same time he is member of the Ibero-American Federation for Mechanical Engineering (FelbIM).

For the above reasons, I strongly recommend Prof. Carlos S. López-Cajún for the IFToMM Dedicated Service Award, in order to recognize his dedicated voluntary service marked by an outstanding performance, demonstrated effective leadership, prolonged and committed service, enthusiasm and faithfulness.

Yours sincerely,

Prof. Dr. Fernando Viadero-Rueda

President of the Spanish Association of Mechanical Engineering

Iftomm Chair Member Organization of Spain

# LETTER OF SUPPORT in favour of Carlos S. López-Cajún



Prof. Teun Koetsier from the Vrije Universiteit Amsterdam (The Netherlands) nominates **Prof. Carlos S. López-Cajún** from the Universidad Autónoma de Querétaro (Mexico) for the IFToMM Dedicated Service Award.

concerning the IFToMM Dedicated Service Award

The IFToMM Dedicated Service Award is presented by IFToMM to honour persons who have provided dedicated voluntary service marked by outstanding performance, demonstrated effective leadership, prolonged and committed service, devotion, enthusiasm and faithfulness.

So far as I know, Prof. López-Cajún is working on the field of History of Mechanism and Machine Science (HMMS) since 2000, giving insights into typically Mexican mechanisms and machines of the past by lectures and publications. I met Prof. López-Cajún on many occasions of HMMS workshops and conferences since then in different countries, and I was every time deeply impressed by his profound knowledge in manufacturing machinery and kinematics.

During my HMMS chairmanship between 2007 and 2010 Prof. López-Cajún and me became friends, and he proved to be most reliable and helpful for me and my activities.

Prof. López-Cajún did not only a great service to the IFToMM Permanent Commission (PC) for HMMS (he is still member of this PC), but for IFToMM in general. From 1994 to 2002 he was Chairman of the Mexican IFToMM Member Organization; from 2004 to 2007 he was Member of the IFToMM Executive Council, and from 2008 to 2011 he acted as IFToMM Secretary General. Besides, he was Associate Editor of the IFToMM Journal of Mechanism and Machine Theory. In 2011, he was one of the main organizers of the 13<sup>th</sup> IFToMM World Congress in Guanajuato in his native country Mexico.

Because of his outstanding achievements in kinematics and machinery in the frame and to the welfare and international reputation of IFToMM, I strongly recommend to confer the IFToMM Dedicated Service Award to Prof. López-Cajún.

Braunschweig (Germany), July 15, 2013

Dr.-Ing. Hanfried Kerle

Past Chairman (2007-2010) IFToMM Permanent Commission

for the History of Mechanism and Machine Science





Curriculum Vitae of Carlos S. López-Cajún, profesor at the School of Engineering at the Universidad Autónoma de Querétaro, Mexico.



He was born in Campeche, Camp, México in 1948. He received the Mechanical Engineer Degree in 1969 from Universidad Nacional Autónoma de México (UNAM) in Mexico City. At the same University he completed a Master Program in Mechanical Engineering in 1977 and in 1982 he received his PhD from Case Western Reserve University. From 1969 to 1975 he worked in the oil and automotive industry. In 1986-1987 he was a Visiting Researcher at McGill University, Canada where he worked on mechanisms design and robotics. Since 1976 he taught courses on Mechanics of Machinery and Mechanisms at UNAM. From 1996 he has taught, besides, courses in mechanical vibrations, machine design and Robotics at the School of Engineering at Universidad Autónoma de Querétaro.

He is member of the Academy of Engineering of Mexico (AI), a Founder Member of the Mexican Society of Mechanical Engineering (SOMIM), and member of the Ibero-American Federation for Mechanical Engineering (FeIbIM). His research interests cover aspects of Mechanism and Machine Science (MMS) and Robotic Mechanical Systems. Specific subjects of his interest are Mechanisms Design, Parallel Manipulators, and History of MMS. On these areas he has authored several research papers published in indexed journals, chapters of books or proceedings of international conferences. He is coauthor of the books "Optimization of Cam Mechanisms", published by Kluwer AP, and translated to Japanese, and "Mecanismos" (in Spanish).





From 1994 to 2002 he was Chairman of the Mexican-IFToMM Commission. In 1996 he collaborated in the creation of the IFToMM-TC on Transportation Machinery. From 2004 to 2007 was a Member of the IFToMM Executive Council (EC) and from 2008-2011 he was Secretary General of the IFToMM EC. He was Associate Editor for the Journal of Mechanism and Machine Theory, and he has served as reviewer for several international conferences and journals. In 2011 he participated in the organization of the 13<sup>th</sup> World Congress held in Guanajuato, Guanajuato, México.

Currently, he is a Member of the Permanent Commission on HMM, and Member of IFToMM Nominating Committee.

Prof. Carlos S. López-Cajún Facultad de Ingeniería, UAQ Cerro las campanas s/n, Col. Centro, 76010 Querétaro, QRO. México Phone: + 52-442-192-1200 x 6090

Email: cajun@uaq.mx





## Nomination for an IFToMM Award

Name of Award: Dedicated Service Award

Date submitted: August 3, 2013

**Full Name of Nominee: Alexander Golovin** 

Nominee's Title/Position: Professor at Bauman Moscow State Technical University (BMSTU) in Moscow, Russia

Nominee's Address: Bauman Moscow State Technical University, 5 Baumanskaya Street, 105005 Moscow, Russia Nominee's Citizenship: Russian

Citation: Next to his important technical contributions to MMS professor Golovin has been very active in IFToMM for many years. His involvement was outstanding. In particular his enthusiastic participation in all activities of IFToMM's Permanent Commission for History was of the utmost importance.

Nominator: Teun Koetsier, Associate professor, Department of Mathematics, VU

University, Amsterdam, The Netherlands, E-mail: <a href="mailto:t.koetsier@vu.nl">t.koetsier@vu.nl</a>
(Past president fo IFToMM's Permanent Commission for History, Past secretary for Honors and Awards)

#### **References:**

- 1. Professor Hong-Sen Yan, NCKU Chair Professor, Executive Vice President,
  National Cheng Kung University (NCKU), Taiwan (Honorary member of
  IFToMM)
  - 2. Professor Francis Moon, Professor Emeritus of Mechanical Engineering, Cornell University, U.S.A (Member US National Academy of Engineering)
- 3. Professor Thomas Chondros, Associate professor, University of Patras, Greece (President of IFToMM's Permanent Commission for History)





#### **Crucial qualifications:**

- In the period 1999-2007 member of IFToMM's Permanent Commission on
  History of Mechanism and Machine Science. As a member he was extremely active
  as the president (Thomas Chondros) and the two active past presidents (Teun
  Koetsier and Marco Ceccarelli) will confirm.
- Since 2001 member of the Russian National Committee for Mechanism and Machine Science
- In 2005 the organization of the 3d international workshop on the History of Mechanism and Machine Sciences in Moscow
- Since 1999 very active in stimulating cooperation between Russian and other specialists in MMS (both on the level of students and scholars)
- Of particular importance is also his involvement in making the huge model collection of Baumann Moscow State Technical University accessible to the outside world.

**Brief biography: See the attached CV** 



## 國立成功大學機械工程系 NATIONAL CHENG KUNG UNIVERSITY DEPARTMENT OF MECHANICAL ENGINEERING

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Creative Machine Design Research Laboratory



Prof. H. S. YAN

July 24, 2013

Professor Teun Koetsier Department of Mathematics, Faculty of Science Vrije University De Boelelaan 1081, NL-1081HV Amsterdam The Netherlands

Re: Letter of support for

Prof. A. Golovin's nomination for IFToMM Dedicated Service Award

#### Dear Prof Koetsier:

It is my pleasure to support the nomination of Professor Alexander Golovin for the **Dedicated Service Award** of IFToMM.

Prof. A. Golovin has been a faculty in the Department of Theory Machines and Mechanisms at Bauman Moscow State Technical University ever since 1968. His major research interests are theory of machines and mechanisms (TMM), mechanisms presses, and history of TMM. Due to his long term devotion, Dr. Golovin has earned his solid reputations as a professor in academic research. He is the (co)author of three books/one book-chapter and more than 100 papers in scientific transactions.

Prof. Golovin has been a very active member of the IFToMM Permanent Commission for the History of Mechanism and Machine Science since 1999. He was a member of IFToMM Permanent Commission for History of Mechanism and Machine Science in 1999-2007 and an observer after 2007. In addition, he serves as a member of Russian National TMM Committee from 2001.

In the past years, Prof. Golovin participated numerous IFToMM activities, such as IFToMM World Congresses (Oulu - 1999, Besancon- 2007, Guanajuato - 2011), Symposia (2000, 2004, 2008 - Cassino; 2001 - Bucharest; 2012 - Amsterdam), Conferences/workshops (2000 - Timisoara; 2004 - Dresden; 2005 - Moscow, Cassino; 2006 - Innsbruck; 2010 - Syracuse). Especially, he hosted a very successful workshop on History of Machines and Mechanisms in Moscow on 17-19 May 2005.

In summary, I have always been impressed by Professor Alexander Golovin's prolonged and dedicated service in IFToMM's PC for History. I hereby offer my strongest endorsement to support his nomination as a candidate for the Dedicated Service Award. If you have any questions, please do not hesitate to contact me.

Sincerely,

Hong-Sen YAN, PhD

Honorary Member, IFToMM

Hong - Sen Yan

Executive Vice President, National Cheng Kung Univ.

Chair Professor, Department of Mechanical Engineering

No. 1, University Road, Tainan 70101, Taiwan

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## CORNELL

U N I V E R S I T Y

Sibley School of Mechanical and Aerospace Engineering Emeritus 204 Upson Hall Ithaca, New York, 14853-7501, USA Professor Francis C. Moon Joseph C. Ford Professor

(607) 255-1222 facsimile e-mail: fcm3@cornell.edu

#### **IFToMM Awards Committee**

This letter is in support of the nomination of Professor Alexander Golovin of the Moscow State University (BMSU) for a meritorious service award. Professor Golovin is a distinguished scholar of machine and mechanism science. He had also been active in preserving the heritage of the BMSU mechanism model collection and has published a history of this collection in the Springer HMM series. He is a member of the History of Mechanism and Machine Science Commission of IFToMM and has been a steadfast supporter of the Commission's Symposia and Workshops. He lead the organization of the Moscow workshop of HMM in 2005. Professor Golovin has also been active in encouraging other Russian scholars of machine science to participate in the activities of IFToMM. I have also found him to be a most engaging and friendly colleague. I give him a most enthusiastic recommendation for this award.

Francis Moon

Professor Emeritus of Mechanical Engineering

**Cornell University** 

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Member US National Academy of Engineering







## ΕΛΛΗΝΙΚΌ ΤΜΗΜΑ ΤΗΣ ΔΙΕΘΝΟΎΣ ΕΝΏΣΗΣ ΘΕΩΡΙΑΣ ΜΗΧΑΝΩΝ ΚΑΙ ΜΗΧΑΝΙΣΜΩΝ

## GREEK COMMITTEE OF THE INTERNATIONAL FEDERATION OF THEORY OF MACHINES AND MECHANISMS

www.iftomm.org

#### Thomas G. Chondros

Associate Professor Internatioal Federation, Theory of Machines and Mechanisms Greeek Committee Representative.

UNIVERSITY OF PATRAS DEPARTMENT OF MECHANICAL ENGINEERING AND AERONAUTICS 265 00 PATRAS, GREECE

http://www.mead.upatras.gr/

http://www.mech.upatras.gr/~chondros

Patras, July 10, 2013

#### Dear Professor Koetsier

Concerning Prof. Alexander Golovin's candidacy for an IFToMM Dedicated Service Award, I strongly support this nomination.

Professor Alexander Golovin provided IFToMM prolonged and dedicated voluntary service marked by outstanding performance, demonstrated effective leadership and committed service, devotion, enthusiasm and faithfulness.

His contribution to IFToMM's PC for History has been greatly appreciated by the IFToMM community. He truly deserves an IFToMM Dedicated Service Award.

Sincerely

Thomas G. Chondros

Thomas G. Chondros



## Curriculum Vitae of Alexander Golovin, professor of Bauman Moscow State Technical University (BMSTU), DSc (Technical)



#### Career

1939, March 3 – Date of birth

1962 – Graduated as a Mechanical Engineer from BMSTU (stamping technology)

1971 – Candidate in mechanical engineering

1968 – Assistant professor at BMSTU

1977 – Associate professor at BMSTU

1993 - Ph.D. at BMSTU in Mechanism and Machine Science

1993 – Full professor at BMSTU

1999 – 2007 – Member of IFToMM's Permanent Commission on History of Mechanism and Machine Science (from 2007 – observer)

From 2001 – Member of the Russian National Committee for Mechanism and Machine Science.

## Research interests

Theory of Machines and Mechanisms, Mechanisms Presses, Engineering Education, History of Mechanism and Machine Science.

#### **Publications**

- Scheme Design of Multibar Linkages, Moscow, BMSTU, 1996. 96 p. (in Russian)
- Mechanisms Dynamics, Moscow, BMSTU, 2001, 2006. 192 p. (in Russian)
- Russian Models from the Mechanisms Collection of Bauman University (with coauthor), Springer, 2007. – 238 p.
- Several papers in the series "Distinguished Figures in Mechanism and Machine Sciences" (volumes 1, 2, 3)
- More than 100 papers in Soviet and Russian scientific transactions, 28 papers in foreign transactions, including 14 in publishing houses Kluwer & Springer
- 5 inventions

## Participation in international meetings (congresses, symposia, conferences, workshops):

- IFToMM World Congresses (Oulu 1999, Bezanson 2007, Guanajuato 2011)
- Symposia on the History of Machine and Mechanism Science (2000, 2004, 2008– Cassino; 2001 – Bucharest; 2012 - Amsterdam)
- Conferences, workshops (2000 Timishoara; 2004 Dresden; 2005 Moscow, Cassino; 2006 – Innsbruck; 2010 – Syracuse)
- Lectures on TMM questions in Cassino university (2008, 2009)

## Organizational works

- Participation in conference organization committees' activities on History of Mechanism and Machine Sciences
- Participation in preparation and realization of a conference on the History of Technology in Russia (Kursk Technical University, 2002, 2003);



- Organization of the 3-d international workshop on History Mechanism and Machine Sciences in Moscow (2005)
- Organization of a visit of 3 Russian students to Cassino University (2008);
- Organization of a visit of 2 Italian students to BMSTU and the organization of a Russian-Italian student conference in BMSTU;
- Organization of several visits to Russia, including BMSTU, of foreign distinguished scholars in Mechanism and Machine Science (2002, 2003, 2005, 2009, 2011)

## Awards:

- Award from IFToMM's Permanent Commission for History of MMS (17 May, 2005)
- IFToMM Springer (June 19, 2011)

Professor Alexander Golovin
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