

Profile Page



Name : Dr Joseph Anand Vaz
Designation : Professor
Department : Mechanical Engineering
Qualification : PhD Mechanical Engineering (IIT Kharagpur)
MTech Mechanical Engineering (IIT Kharagpur)
BE(Mech) Mechanical Engineering (University of Poona, COEP)
JSPS Post Doctoral Research Fellow Robotics (Ritsumeikan University, Japan)
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Research Interests :

System Dynamics and Control - Bond graph, Robotics, Mechatronics, Mechanisms and machines, Biomechanics - understanding musculoskeletal actuation and systematic development of prosthetic devices for rehabilitation of hand impairment, Innovative teaching methodologies

Journal Publications :

| Year | Journal | Publication |
|------|---|---|
| 2020 | Mechanism and Machine Theory, Volume 146, April 2020, 103719 | Neeraj Mishra, Anand Vaz, Development of trajectory and force controllers for 3-joint string-tube actuated finger prosthesis based on bond graph modeling |
| 2020 | Computer Assisted Methods in Engineering and Science, v. 27, n. 1, p. 71-85, June 2020. ISSN 2299-3649, https://doi.org/10.24423/comes.280 | Aman Kumar Maini and Anand Vaz, Inverse Kinematics of a Spatial Mechanism using Multibond Graph |
| 2020 | Tekstilec, 2020, 63(1), 68-76 | Sukhvir Singh, Niranjan Bhowmick, Anand Vaz, Theoretical Modelling of Can-spring Mechanism Using Bond Graph |
| 2020 | Mechanism and Machine Theory, Volume 150, August 2020, 103858 | Arvind Kumar Pathak, Anand Vaz, An alternative model for contact interaction of mating bones with soft articular cartilage at synovial joints |

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| 2020 | Computer Assisted Methods In Engineering And Science, [S.I.], sep. 2020. ISSN 2299-3649. Available at: https://cames.ippt.pan.pl/index.php/cames/article/view/298 | Aman Kumar Maini and Anand Vaz, Different Dynamic Formulations for a Mechanism using Bond Graph. |
| 2017 | Mechanism and Machine Theory, Volume 117, November 2017, Pages 1–20 | Neeraj Mishra, Anand Vaz, Bond graph modeling of a 3-joint string-tube actuated finger prosthesis |
| 2015 | Mechanism and Machine Theory, Volume 91, September 2015, Pages 187–208 | Anand Vaz, Kanwalpreet Singh, Geneviève Dauphin-Tanguy, Bond graph model of extensor mechanism of finger based on hook–string mechanism |
| 2015 | Mechanism and Machine Theory, Volume 86, April 2015, Pages 265–280 | Anil Kumar Narwal, Anand Vaz, K. D. Gupta, Bond graph modeling of dynamics of soft contact interaction of a non-circular rigid body rolling on a soft material |
| 2014 | Mechanism and Machine Theory, Volume 75, May 2014, Pages 79–96 | Anil Kumar Narwal, Anand Vaz, K. D. Gupta, Study of dynamics of soft contact rolling using multibond graph approach |
| 2007 | ASME Journal of Dynamic Systems, Measurement & Control, Vol. 129, 2007, pp. 105-113, http://dx.doi.org/10.1115/1.2397160 | Anand Vaz and Shinichi Hirai, “A Bond Graph Approach to the Analysis of Prosthesis for a Partially Impaired Hand” |

Conference Publications :

| Year | Conference | Publication |
|------|--|--|
| 2019 | 2019 IEEE 5th International Conference for Convergence in Technology (I2CT) Pune, India. Mar 29-31, 2019 | Vivek Soni, Arvind Kumar Pathak and Anand Vaz, Exploiting the Concept of Causality in Bond Graph for Approximate Differentiation of Signals through Integration |
| 2018 | 3rd International and 18th National Conference on Machines and Mechanisms (iNaCoMM2017), Bhabha Atomic Research Centre, Trombay, Mumbai, India | Arvind Kumar Pathak and Anand Vaz, “A Simplified Model for Contact Mechanics of Articular Cartilage and Mating Bones Using Bond Graph,” paper no. 108, Dec. 2017, pp. 1-10, doi: 10.1007/978-981-10-8597-0_47 |
| 2015 | 2nd International and 17th National Conference on Machines and Mechanisms (iNaCoMM2015) , IIT Kanpur, India | Arvind Kumar Pathak, Neeraj Mishra and Anand Vaz, “Modeling and Simulation of a Three-Joint Prosthetic Finger Actuated by Remaining Functional Natural Fingers: A Bond Graph Approach,” paper no. 115, Dec. 2015, pp. 1-14 |
| 2015 | 2nd International and 17th National Conference on Machines and Mechanisms (iNaCoMM2015) , IIT Kanpur, India | Anil Kumar Narwal, Anand Vaz, Mohit Sachdeva, “Simulation of Impact and Rolling Contact Dynamics between a Rigid Body and a Soft Material using Multibond Graph Approach,” paper no. 93, Dec. 2015, pp. 1-9 |
| 2014 | 11th International Conference on Bond Graph Modelling & Simulation (ICBGM 2014), Monterey, California, USA | Anil Kumar Narwal, Anand Vaz and K. D. Gupta, “Understanding Soft Contact Interaction between a Non Circular Rigid Body and a Soft Material using Multibond graph” |

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| 2013 | 2013 1st International Conference on Artificial Intelligence, Modeling and Simulation - AIMS 2013, Kota Kinabalu, Malaysia, December 3-5, 2013 | Neeraj Mishra and Anand Vaz, "Modeling and Simulation of Dynamics of a Three Dimensional Teeter Toy Using Bond Graph", paper no. 1569850197, IEEE Computer Society, Washington, DC, USA, p. 227-232, doi: 10.1109/AIMS.2013.43. |
| 2013 | Proceedings of the 1st International and 16th National Conference on Machines and Mechanisms (iNaCoMM 2013), IIT Roorkee, India, December 18-20, 2013 | Saurabh Goyal and Anand Vaz, "Modeling and Simulation of Dynamics of Differential Gear Train Mechanism using Bond Graph", paper ref. no. 170, p. 30-41 |
| 2013 | 1st International and 16th National Conference on Machines and Mechanisms (iNaCoMM 2013), IIT Roorkee, India, December 18-20, 2013 | Anil Kumar Narwal, Anand Vaz and K. D. Gupta, "Evaluation of Dynamics of Soft Contact Rolling using Multibond Graph Approach", paper ref. no. 64, p. 23-29 |
| 2013 | 2013 Conference on Advances in Robotics (AIR 2013), International Conference of The Robotics Society of India, July 4 - 6, 2013, Pune, India | Sahil Kalra, Anand Vaz, Neeraj Mishra, "Development of a Test Rig for the study of Musculoskeletal Actuation of Human finger", paper no. 114, doi: 10.1145/2506095.2506104 |
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Book/Chapter Publications :

| Type | Title | Publisher | Authors | ISBN/ISSN No. | Year |
|--------------|--|---------------------|-----------------------------------|-------------------|------|
| Book Chapter | A Simplified Model for Contact Mechanics of Articular Cartilage and Mating Bones Using Bond Graph. In: Badodkar D., Dwarakanath T. (eds) Machines, Mechanism and Robotics. Lecture Notes in Mechanical Engineering | Springer, Singapore | Arvind Kumar Pathak and Anand Vaz | 978-981-10-8596-3 | 2018 |

Research Projects :

| Role | Project Type | Title | Funding Agency | From | To | Amount | Status | Co-Investigator |
|------------------------|---|---|--|------------|-----------|---------------|-------------|-------------------------------------|
| Project Investigator | Technology Gap Analysis Study | Technology Gap Analysis Study of Sewing Machine Cluster at Ludhiana | Technology, Information, Forecasting and Assessment Council (TIFAC), Government of India | 01-02-11 | 31-12-12 | Rs. 10,00,000 | Completed | Dr. R. K. Garg, Dr. A. Mukhopadhyay |
| Principal Investigator | ISRO Space Technology Incubation Center (S-TIC) Project | Modelling and Simulation of Antenna Control Servo System | ISRO | March 2020 | till date | Rs. 7,50,000 | In progress | Dr. K. S. Nagla, Dr. Nitesh Kashyap |

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| Co-Investigator | Collaborative Research Scheme Project | Design and Development of Portable Gnathodynamometer | Scheme by NPIU under TEQIP. Joint project with MITS, Gwalior | Sept 2019 | till date | Rs. 14,64,000 | In progress | Mr. Neeraj Mishra, Dr. Manish Kumar Sagar, Mr. Manish Sharma, Dr. Ravi Kant Ranjan |
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Events Organized :

| Category | Type | Title | Venue | From | To | Designation |
|------------------------|---------------|---|---|----------|----------|--|
| GIAN Course | International | GIAN course on, "Dynamic modelling and simulation of multi-physics systems using bond graph"; Foreign Faculty: Professor Genevieve Dauphin-Tanguy, Ecole Centrale de Lille, France | NKN Classroom, NIT Jalandhar | 28-11-16 | 07-12-16 | Coordinator and Indian Faculty |
| Indo-French Workshop | International | Indo-French Workshop on Developments in Academics and Research in Engineering Systems' | Ecole Centrale de Lille, Cité Scientifique - CS20048, 59651 Villeneuve d'Ascq Cedex, France | 23-06-14 | 25-06-14 | Coordinator, jointly with Professor Genevieve Dauphin-Tanguy |
| Indo-French Workshop | International | Indo-French Workshop on Developments in Academics and Research in Engineering Systems | NIT Jalandhar, India | 18-03-13 | 19-03-13 | Coordinator, jointly with Professor Genevieve Dauphin-Tanguy |
| Invited lecture series | National | Invited lecture on 'Bond Graph modeling' by Professor Genevieve Dauphin-Tanguy, Professor, Ecole Central de Lille, France and Head of the research group on 'Bond Graph modeling' in the Laboratoire d'Automatique Genie Informatique et Signal (LAGIS) | IT Park, NIT Jalandhar | 06-12-10 | 07-12-10 | Coordinator |

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|-----------------------------------|---------------|---|---|------------|------------|--|
| Invited lecture series | National | Invited lecture on 'Bond Graph modeling' by Professor Genevieve Dauphin-Tanguy, Professor, Ecole Central de Lille, France and Head of the research group on 'Bond Graph modeling' in the Laboratoire d'Automatique Genie Informatique et Signal (LAGIS) | IT Park, NIT Jalandhar, India | 16-01-12 | 17-01-12 | Coordinator |
| MHRD/AICTE One Week Winter School | National | MHRD/AICTE One Week Winter School on Modeling, Simulation and Control of Engineering Systems | Department of Mechanical Engineering, NIT Jalandhar | 05-01-09 | 09-01-09 | Coordinator and course faculty |
| Signing of MoU | International | Signing of Memorandum of Understanding (MoU) between Ecole Centrale de Lille and NIT Jalandhar, by respective Directors - Professor Etienne Craye and Professor S K Das | Ecole Centrale de Lille, Centrale Lille, Cité Scientifique - CS20048, 59651 Villeneuve d'Ascq Cedex, France | 12-06-12 | 12-06-12 | Coordinator, jointly with Professor Genevieve Dauphin-Tanguy |
| GIAN Course | International | GIAN course on, "Manufacturing Automation – Robotics and Process Integration"; Foreign Faculty: Professor Subramaniam Balakrishnan, Department of Mechanical Engineering, University of Manitoba, Winnipeg, Manitoba, Canada | NKN Classroom, NIT Jalandhar | 17-12-2018 | 22-12-2018 | Coordinator, jointly with Professor Vishal Santosh Sharma, Department of IPE |

Professional Affiliations :

| Designation | Organization |
|-------------|--|
| Member | IEEE (The Institute of Electrical and Electronics Engineers, Inc.) |
| Member | ASME (American Society of Mechanical Engineers) |
| Life Member | ISTE (Indian Society for Technical Education) |
| Life Member | ASM (Association of Mechanisms and Machines) |

PhD Supervised :

| Scholar Name | Research Topic | Status | Year | Co-Supervisor |
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| Neeraj Mishra | Dynamics and Control of a Class of Hand Prosthesis | Submitted | 2020 | -- |
| Aman Maini | Dynamics of Mechanisms using Multibond Graph Approach | Synopsis submitted | 2020 | -- |
| Sukhvir Singh | Effects of Can-Spring Parameters on Combed Yarn Quality | Completed | 2019 | Dr. Niranjan Bhowmick |
| Kanwalpreet Singh | Investigation into the Biomechanics of Musculoskeletal System of Hand using Bond Graph based Techniques | Completed | 2016 | J. S. Dhillon (SLIET Longowal) |
| Anil Kumar Narwal | Evaluation of Dynamics of Soft Contact Interaction Using Multibond Graph Approach | Completed | 2015 | K. D. Gupta (DCRUST Murthal) |
| Sandeep Uppal | Musculoskeletal Actuation System of Human Thumb | In progress | | -- |
| Arvind Kumar Pathak | Biomechanics of the Carpal joint | In progress | | -- |
| Rahul Rathee | Dynamics of Manipulation of a Rigid Object with Soft Contact | In progress | | Anil Kumar Narwal (DCRUST Murthal) |
| Vivek Soni | Bond graph modeling, design and development of a knee assistance exoskeleton | In progress | | -- |

Award and Honours :

| Title | Activity | Given by | Year |
|---|--|---|-------------|
| Post doctoral fellowship (PDF) awarded by the Japan Society for the Promotion of Science (JSPS) | Post doctoral research work, Hirai Laboratory, Department of Robotics, Ritsumeikan University, Japan | Japan Society for the Promotion of Science (JSPS) | 2002-2004 |