

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
2022	Computer Assisted Methods In Engineering And Science, v. 29, n. 3, p. 197–227, Aug. 2022. ISSN 2299-3649, https://doi.org/10.24423/cames.411	Sandeep Kumar Uppal, Anand Vaz, "Bond Graph Modeling of Muscle-Tendon Actuation of a Phalange"
2022	Computer Assisted Methods in Engineering and Science, [S.l.], Mar. 2022. ISSN 2299-3649. doi: http://dx.doi.org/10.24423/cames.386 .	Rathee Rathee, Anil Kumar Narwal, & Anand Vaz, "Soft Contact Manipulation of a Rigid Object Using Multibond Graph"
2021	International Journal of Modelling and Simulation (TJMS), https://doi.org/10.1080/02286203.2020.1846013	Aman Kumar Maini, Anand Vaz & Geneviève Dauphin-Tanguy, "Dynamics of a power hacksaw mechanism, contact interaction with the workpiece, and material removal"
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/cames.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, Niranjana 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
2020	Computer Assisted Methods In Engineering And Science, [S.l.], 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”
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

Book/Chapter Publications :

Type	Title	Publisher	Authors	ISBN/ISS N No.	Year
Book Chapter	A Bond Graph Model for the Estimation of Torque Requirements at the Knee Joint During Sit-to-Stand and Stand-to-Sit Motions. In: Kumar R., Chauhan V.S., Talha M., Pathak H. (eds) Machines, Mechanism and Robotics. Lecture Notes in Mechanical Engineering. https://doi.org/10.1007/978-981-16-0550-5_154	Springer, Singapore	Vivek Soni, Anand Vaz	978-981-16-0549-9	2022
Book Chapter	A Computation Model of Contact Interaction Between the Scaphoid and Its Neighboring Bones Using Bond Graph Approach. In: Kumar R., Chauhan V.S., Talha M., Pathak H. (eds) Machines, Mechanism and Robotics. Lecture Notes in Mechanical Engineering. https://doi.org/10.1007/978-981-16-0550-5_146	Springer, Singapore	Arvind Kumar Pathak, Anand Vaz	978-981-16-0549-9	2022

Book Chapter	Trajectory Control and Force Control of Biomimetic Fingers by Tendon-Based Actuation System Using Bond Graph. In: Kumar R., Chauhan V.S., Talha M., Pathak H. (eds) Machines, Mechanism and Robotics. Lecture Notes in Mechanical Engineering. https://doi.org/10.1007/978-981-16-0550-5_112	Springer, Singapore	Saini V., Simranpal Singh, Neeraj Mishra, Anand Vaz	978-981-16-0549-9	2022
Book Chapter	Motion Control of a Phalange Using Tendon-Based Actuation System: A Bond Graph Approach. In: Kumar R., Chauhan V.S., Talha M., Pathak H. (eds) Machines, Mechanism and Robotics. Lecture Notes in Mechanical Engineering. https://doi.org/10.1007/978-981-16-0550-5_141	Springer, Singapore	Sandeep Uppal, Anand Vaz	978-981-16-0549-9	2022
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. https://doi.org/10.1007/978-981-10-8597-0_47	Springer, Singapore	Arvind Kumar Pathak and Anand Vaz	978-981-10-8596-3	2019

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	October 2021	Rs. 7,50,000	Completed	Dr. K. S. Nagla, Dr. Nitesh Kashyap

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	Completed	Mr. Neeraj Mishra, Dr. Manish Kumar Sagar, Mr. Manish Sharma, Dr. Ravi Kant Ranjan
Principal Investigator	DST SERB CRG	Design, development and control of a three-joint string-tube actuated finger prosthetic system for position or force trajectories at the tip	DST SERB	18-03-22	17-03-25	Rs. 46,08,277	On going	--

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
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
Arun Mandhotra	Dynamics and Control of Prosthetic Systems	In progress	2022	--
Neeraj Mishra	Dynamics and Control of a Class of Hand Prosthesis	Completed	2021	--
Aman Kumar Maini	Dynamics of Few Practical Mechanisms using Multibond Graph	Completed	2021	--
Sukhvir Singh	Effects of Can-Spring Parameters on Combed Yarn Quality	Completed	2020	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		--

Admin. Responsibilities :

Position Held	Organization	From	To
Coordinator ISRO Space Technology Incubation Centre (S-TIC) at NIT Jalandhar	ISRO	2019	Present
Dean Academic	Dr B R Ambedkar NIT, Jalandhar	May 2015	January 2017
Head, Department of Mechanical Engineering	Dr B R Ambedkar NIT, Jalandhar	2009	2012

Award and Honours :

Title	Activity	Given by	Year
Invited as member of PhD jury, and to deliver lectures on 'Multibody System Dynamics'	PhD evaluation; and deliver lectures on 'Multibody System Dynamics'	Centrale Lille, France	2015
Visiting Professor to Ecole Centrale de Lille, France	Visiting Professor for a duration of one month during June - July 2014	French Ministry of Education, Research and Technology	2014

Visiting Professor to Ecole Centrale de Lille, France	Visiting Professor for a duration of one month during June - July 2012	French Ministry of Education, Research and Technology	2012
Visiting Professor to Ecole Centrale de Lille, France	Visiting Professor for a duration of one month during June - July 2010	French Ministry of Education, Research and Technology	2010
Visiting Professor to Ecole Centrale de Lille, France	Visiting Professor for a duration of one month during June - July 2007	French Ministry of Education, Research and Technology	2007
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
Visiting Professor to Ecole Centrale de Lille, France	Visiting Professor for a duration of one month during June - July 2002	French Ministry of Education, Research and Technology	2002
Visiting Professor to Ecole Centrale de Lille, France	Visiting Professor for a duration of one month during June - July 2000	French Ministry of Education, Research and Technology	2000