



Dr. Tony Punnoose Valayil
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BIOSKETCH

Dr. Tony Punnoose Valayil, possesses strong academic qualifications and a distinguished record of research, innovation, and teaching that enable him to contribute effectively to advanced technological goals. Dr. Tony has expertise in robotics and automation in architecture, human-machine interfaces, advanced autonomous systems, swarm robotics, wearable robotic devices, soft robotics, parallel robots, and modelling and simulation of complex engineering systems. Dr. Tony completed a postdoctoral fellowship in robotics at Institute of Robotics, Bulgarian Academy of Sciences, Bulgaria, and was subsequently appointed as a Research Scientist at the same institution. Dr. Tony later held postdoctoral research appointments at University of Cassino and Southern Lazio, Italy, and Alfaisal University, Saudi Arabia, and has developed several innovative robotic systems, including exoskeletons, soft robots, and rehabilitation devices, alongside contributions to robot kinematics and mechanism design.

Educational Profile

- Doctor of Philosophy (Ph.D.) in Mechanical Engineering**
 Anna University, Chennai.
 Year of Passing: 2020
Thesis title: Kinematic Analysis of Hybrid Exoskeleton Robot with Spherical Joints for Rehabilitation of Upper Limb in Stroke Affected Patients.
Thesis Supervisor: Dr. V. Selladurai,
 Principal (Retired),
 Department of Mechanical Engineering,
 Coimbatore Institute of Technology (CIT), Coimbatore.
- Master of Technology (M.Tech.) in Machine Design**
 Mahatma Gandhi University, Kottayam.
Thesis title: Crash Simulation in ANSYS LS-DYNA to Explore the Crash Performance of Composite and Metallic Materials.
- Bachelor of Engineering (B.E.) in Mechanical Engineering**
 Anna University, Chennai.
Thesis title: Replacement of fire brick lining by ceramic lining with P1 material in a furnace (Industrial project).

Positions Held

July 1, 2026 – Present	Associate Professor Department of Mechatronics, PSG Institute of Advanced Studies, Peelamedu, Coimbatore, INDIA.
July 1, 2026 – Present	Associate Professor Department of Robotics and Automation Engineering, PSG College of Technology, Peelamedu, Coimbatore, INDIA.
December 02, 2025 – May 07, 2026	Postdoctoral Research Fellow DaVinciAT Robotics in Architecture Research Center, Department of Architectural Engineering, College of Engineering and Advanced Computing, Alfaisal University, Riyadh, SAUDI ARABIA .
June 1, 2024 – June 1, 2025	Research Scientist Robotics and Mechatronics Department, Institute of Robotics, Bulgarian Academy of Sciences, Sofia, BULGARIA .
October 10, 2024 – May 31, 2025	Postdoctoral Research Fellow Department of Electrical and Information Engineering, University of Cassino and Southern Lazio, Cassino, ITALY .
May 30, 2022 – May 30, 2024	Postdoctoral Fellow (Petar Beron Fellow) Institute of Robotics, Bulgarian Academy of Sciences, Sofia, BULGARIA
January 3, 2023 – November 30, 2023	Researcher Center of Competence: "Intelligent Mechatronic, Eco- and Energy-Saving Systems and Technologies (CoC IMEESST)", Institute of Robotics, Bulgarian Academy of Sciences, Sofia, BULGARIA .
June 16, 2021 – July 28, 2021	Research Fellow Centre for Biomedical Engineering, Indian Institute of Technology, Delhi, INDIA.
July 17, 2013 – September 29, 2025	Assistant Professor Department of Mechanical Engineering, Coimbatore Institute of Technology (CIT), Coimbatore, INDIA.
June 18, 2012 – July 16, 2013	Assistant Professor Department of Mechanical Engineering, Gurudeva Institute of Science and Technology (GISAT), Kottayam, INDIA.
2010-2011	Negotiator T.J.T Exporters, Kottayam, India and Law office of Abraham and Sweeney, Florida, U.S.A.

Research Areas

- Robotics
- Machine Design
- Biomechanics
- Automation

Awards & Achievements

- Won Petar Beron Postdoctoral Fellowship Grant in the Competition under the National Scientific Program “Petar Beron i NIE” (P. Beron) 2021 by Ministry of Education and Science of Bulgaria and the Bulgarian National Science Fund, **BULGARIA**.
- Won UAE University Postdoctoral Fellowship on Industry 4.0, 2025, funded by Office of Associate Provost for Research in Collaboration with District 4.0 Enablement Center, UAE University, Al Ain, **UNITED ARAB EMIRATES**.
- Won Wales Innovation Network (WIN) Small Grant Fund on WIN’s core theme “Population Health and Biotech” as External Collaborative Stakeholder funded by Universities Wales, Universities UK, **UNITED KINGDOM**.
- Won postdoctoral Research Grant (Assegno di Ricerca) funded by The Italian Ministry of University and Research (MUR) under the call PRIN 2022 Project of Relevant National Interest (Progetti di Ricerca di Interesse Nazionale), **ITALY**.
- Received Erasmus Grant from European Union for Erasmus+ Staff mobility (Training) to visit G-SCOP Laboratory, Grenoble Alpes University, **FRANCE**.
- Second prize in the e-Yantra Robotics competition (eYRC-2019), IIT Bombay, India (Mentor).
- One of the eleven finalist teams out of 92 teams in the e-Yantra ideas competition (eYIC-2015), IIT Bombay, India. (Mentor).
- Second prize in regional finals, ‘Team Leader’ for Robotics Teacher’s Team of CIT, e-Yantra Robotics Teacher competition, IIT Bombay, India.
- One of the Regional Finalist Team in the e-Yantra ideas competition (eYIC- 2017), IIT Bombay, India. (Mentor).
- Third prize in a technical event “INNOVAY ‘19”, on “Digitization Problem” at Cameron, Coimbatore, A Schlumberger Company, India (Mentor).
- First prize in CAD Modelling, National level Technical Symposium for Mechanical Engineering, PSNACET, Dindigul, India.
- First place in Paper Presentation, National level Technical Symposium for Mechanical Engineering, PSNACET, Dindigul, India.
- First prize in a Marketing Event, National level Technical Symposium for Mechanical Engineering, PSNACET, Dindigul, India.

Invited Talks

- Invited for Summer Winter School Scheme (SWSS), Coimbatore Institute of Technology, INDIA. Topic: Parallel robots used for newer machining process. (May 13, 2015).
- Workshop on Modelling of Multidisciplinary Dynamic Systems, Industry Institute Partnership Cell (IIPC, AICTE) and CIT, INDIA. Topic: Labview Software. (April 13, 2018).
- Invited for 13th International Engineering Week, Hochschule Schmalkalden University of Applied Sciences, **GERMANY**. Topic: Mechanics of robot manipulators. (Dec 4, 2023).

- Invited for Scientific seminar, South-West University “Neofit Rilski” Blagoevgrad, **BULGARIA**. Topic: Exoskeleton robot for hand rehabilitation post-stroke. (February 14, 2024).
- Invited for National Level Technical Symposium ‘Mechnotron 2024’, Coimbatore Institute of Technology, INDIA. Topic: Robotics and Industry 5.0. (April 14, 2024).
- Invited for Workshop on Soft Exoskeleton Robots and Digital Healthcare at University of Wales Trinity Saint David, **UNITED KINGDOM** on 23 June 2025. Topic: Bilateral Stand-Alone soft Exoskeleton robot for rehabilitation in stroke patients + Prototype Demonstration.

Journal Publications

- **T. P. Valayil**, Mokhtar T. H., Comparative Kinematics and Static Analysis of Regular and Irregular Stewart-Gough Platform Configurations, *Technologies*, 2026, 14 (6), 312. <https://doi.org/10.3390/technologies14060312>.
- Joseph, S.; Fung, W.K.; **T. P. Valayil**.; Prasad, R.; Bashford, T. A Systematic Literature Review on Intelligent Soft Hand Exoskeleton Robots: Artificial Intelligence-Enabled Personalisation, Adaptation, and Design Considerations. *Robotics* 2026, 15(5), 99. <https://doi.org/10.3390/robotics15050099>.
- **T. P. Valayil** and T. K. Tanev, “A 3UPS/S Spherical Parallel Manipulator Designed for Robot-Assisted Rehabilitation after Stroke”, *Applied Sciences*, vol. 14, no. 11, pp.1-30, 2024. <https://doi.org/10.3390/app14114457>.
- **T. P. Valayil** and T. K. Tanev, "Optimum design of a bilateral stand-alone robotic motion-assisted fingered exoskeleton for home rehabilitation", *Machines*, vol. 12, no. 10, pp. 1-31, 2024. <https://doi.org/10.3390/machines12100685>.
- T. K. Tanev, P. Dachkinov, **T. P. Valayil**, M. Dimitrova, S. Kostova, A. Lekova, “Implementation of Robotic and Assistive Technologies in the Patient-Centered Physical Rehabilitation”, *Journal of the Technical University of Gabrovo*, vol. 66, pp. 11-15, 2023. <https://doi.org/10.62853/GJMV4858>.
- **T. P. Valayil** and R. S. Augustine, “Kinematic and workspace analysis of a robotic device for rehabilitation of upper limb in stroke-affected patients”, *Acta of Bioengineering and Biomechanics*, Vol. 23, No .3, pp. 175-188, 2021. DOI: 10.37190/ABB-01875-2021-03.
- **T. P. Valayil**, and P. Boopathi, “Prediction of Clapper Position and Chattering Verification in a Swing Check Valve using Hall Effect Sensor”, *Advancement in Mechanical Engineering and Technology*, vol. 3, no. 1, 2020. <http://doi.org/10.5281/zenodo.3722788>.
- **T. P. Valayil**, D. Kumar, H. Krishnan, Nihilkarthi, V. Rajasekar, “Manufacturing Industry Workplace Safety Using Image Processing”, *Journal of Advanced Research in Industrial Engineering*, vol. 2, no.1, pp.1-9, 2020. <http://doi.org/10.5281/zenodo.3903046>.
- **T. P. Valayil**, V. Selladurai and M. Velliangiri, “Modelling and Simulation of Spatial 4R and RRRS Mechanisms for Deploying in Making Ballistic Barrier”, *Tierärztliche Praxis*, vol. 40, 2020. ISSN: 0303-6286.
- **T. P. Valayil**, S. Velappan, P. L. Pandian, “Analysing the Kinematic Characteristics of Bennett Mechanisms and its Networks for Usage in Forming Deployable Structures”, *Mechanika*, vol.25, no. 4, pp. 269-275, 2019. <https://doi.org/10.5755/j01.mech.25.4.22527>.
- **T. P. Valayil**, V. Selladurai and N R Ramaswamy, “Kinematic Modeling of a Serial Robot using Denavit-Hartenberg Method in MATLAB”, *TAGA Journal of Graphic Technology*, vol. 14, pp. 2437-2445, 2018. ISSN: 1748-0345.
- **T. P. Valayil**, M. S. Kumar, I. Jowin and V. Vignesh, “Developing a Real Time System Using Labview for Monitoring and Controlling the Inside Temperature-A Greenhouse Automation”, *Global Journal of Engineering Science and Research*, vol. 2, no. 5, pp.17-21, 2015. ISSN 2348– 8034.

- **T. P. Valayil** and J. C. Issac, “Crash Simulation in ANSYS LS-DYNA to Explore the Crash Performance of Composite and Metallic Materials”, International Journal for Scientific Engineering and Research, vol. 8, no. 4, 2013. ISSN 2229-5518.

Total Number of Conference Papers/Proceedings: 11

Conference Publications

- **T. P. Valayil**, P. Di Lillo, and G. Antonelli, “A weighted approach for Bearing only tracking of underwater acoustic sources with unbalanced measurements,” 2025 11th International Conference on Control, Decision and Information Technologies (CoDIT), Split, **CROATIA**, 2025, PP. 1-6, Doi:10.1109/CoDIT66093.2025.11321896.
- **T. P. Valayil** and T. K. Tanev, “Design of a parallel wrist exoskeleton for rehabilitation post-stroke’, IEEE 2024 10th International conference on automation, robotics and applications (ICARA 24), Athens, **GREECE**, February 22-24, 2024.
- **T. P. Valayil** and T. K. Tanev, “Design and development of an exoskeleton system using a 3UPU spherical parallel manipulator for rehabilitation in stroke patients’, IEEE 2024 6th International congress on human-computer interaction, optimization and robotics applications. (ICHORA 24), Istanbul, **TURKEY**, May 23-25, 2024.
- T. K. Tanev, P. Dachkinov, **T. P. Valayil**, M. Dimitrova, S. Kostova, A. Lekova, “Implementation of Robotic and Assistive Technologies in the Patient-Centered Physical Rehabilitation”, International Scientific Conference "Mechatronics, Eco and Energy Saving Systems and Technologies" Gabrovo 23 under project BG05M2OP001-1.002-0023 Competence Center "Intelligent mechatronic, eco- and energy-saving systems and technologies", Technical University of Gabrovo, **BULGARIA**, May 21-23, 2023, ISSN: 2815-4924.
- **T. P. Valayil** and R. S. Augustine, “Method to solve the forward kinematics of parallel and serial manipulators”, First International conference on Robotics, Automation and Intelligent systems, Karunya University, Coimbatore, INDIA, November 12-13, 2021.
- **T. P. Valayil** and M. S. Bharanidharan, “Quintic trajectory planning of a 2-DOF manipulator”, First International conference on Robotics, Automation and Intelligent systems, Karunya University, Coimbatore, INDIA, November 12-13, 2021.
- **T. P. Valayil** and J. C. Issac, "Crash Simulation in ANSYS LS-DYNA to Explore the Crash Performance of Composite and Metallic Materials", International Conference on Global Innovations in Technology and Science, Saintgits College of Engineering, Kottayam, INDIA, April 4-6, 2013.

Conference Presentations (Published Abstracts)

- D. Kumar, H. Krishnan, Nihilkarthi, Rajasekar, **T. P. Valayil**, “Artificial Intelligence in Industry 4.0-Enabling Workplace Safety in Industry”, First International Conference on Industry 4.0, Coimbatore Institute of Technology, India, January 9 -11, 2019.
- **T. P. Valayil**, V. Selladurai and, N. R. Ramaswamy, “Kinematics and Workspace Analysis of a Six-Degree-of-Freedom Hybrid Robot Exoskeleton Robot for Rehabilitation of Stroke Affected Patients”, First International Conference on Industry 4.0, Coimbatore Institute of Technology, India, January 9 -11, 2019.
- **T. P. Valayil**, “A Review on Various Approaches for Solving Forward Kinematics of Parallel Robots”, First International Conference on Industry 4.0, Coimbatore Institute of Technology, India, January 9 -11, 2019.

- **T. P. Valayil**, D. Kumar, H. Krishnan, N. K. Venkatesan, V. Rajasekar, “Manufacturing industry Workplace Safety Using Image Processing”, International conference on Sustainable Innovations in Civil and Mechanical Engineering, Mangalam College of Engineering, Kottayam, India, May 16-17, 2019.

Books/Book Chapters

- **T. P. Valayil**, “Kinematics and Foldability Analysis of Bennett Mechanisms and its Networks” R. Kumar et al. (eds.), Machines, Mechanisms and Robotics, Lecture Notes in Mechanical Engineering, Springer Nature Singapore Pte Ltd. 2022. https://doi.org/10.1007/978-981-16-0550-5_162.

Professional Activities

- **Reviewer**, International Journal of Big Data Management (IJBDM), Inderscience Publishers; Robotica Journal, Cambridge University Press, UK; Acta of Bioengineering and Biomechanics Journal, Wroclaw University, Poland; The Journal of Supercomputing, Springer Nature; Scientific Reports Journal, Springer Nature; Journal of the Brazilian Society of Mechanical Sciences and Engineering, Springer.
- **Editor**, The proceedings on international conference on industry 4.0-An Ensemble of Transpiring Cyber Physical Systems, Impact on Smart Connected Manufacturing Systems, Coimbatore Institute of Technology, India.
- **Reviewer**, IFToMM Asian Mechanisms and Machine Science Conference 2021, VIETNAM.
- **Member**, Board of studies, Department of Mechanical Engineering, Coimbatore Institute of Technology, India.
- **Member**, National Board of Accreditation, Department of Mechanical Engineering, Coimbatore Institute of Technology, India.
- **Coordinator**, National Assessment and Accreditation Council (NAAC), Department of Mechanical Engineering, Coimbatore Institute of Technology, India.
- **Member**, Green KMML, The Kerala Minerals and Metals Ltd., Chavara, India.
- **Life member**, Association of Machines and Mechanisms (AMM), International Federation for the Promotion of Mechanism and Machine Science (IFTToMM), India.
- **Chairperson**, 1st National Conference on Mathematical Modelling and Computation 2020, Coimbatore Institute of Technology, India.
- **Program Committee Member**, The First International Conference on ‘Industry 4.0’, Coimbatore Institute of Technology, India, January 9th -11th 2019.

Certification

- CSWIP Visual Welding Inspector, The Welding Institute (TWI) Cambridge, **UK**.
- Effective Teaching and Learning Certificate, Teaching Learning Centre (TLC), Ministry of Education, India.
- LABVIEW Core 1 and Core 2 certificate, National Instruments, India.
- MathWorks Training Certificate on MATLAB Onramp.
- Summer Faculty Research Fellowship under Continuing Education Programme (CEP), IIT Delhi.
- Erasmus+ Staff mobility (Training) certificate from Grenoble Alpes University, **FRANCE**.

Funding

- Won postdoctoral Research Fund under Research Grant for COMET project from University of Cassino and Southern Lazio (UNICAS), Italy. A PRIN 2022 Project-Project of Relevant National Interest, Funded by Ministry of University and Research (MUR), **ITALY**. Amount **€30,000**.
- Received Erasmus Grant from European Union for Erasmus+ Staff mobility (Training) to visit G-SCOP Laboratory, Grenoble Alpes University, **FRANCE**. Amount **5000 BGN**.
- Received financial assistance from Technical Education Quality Improvement Programme of Government of India, while pursuing Ph.D. Amount **Rs. 2,00,000**.
- Won UAE University Postdoctoral Fellowship on Industry 4.0, funded by Office of Associate Provost for Research in Collaboration with District 4.0 Enablement Center, UAE University, Al Ain, **UNITED ARAB EMIRATES**. Amount: **AED 240,000**.
- Won Wales Innovation Network (WIN) Small Grant Fund on WIN's core theme "Population Health and Biotech" as External Collaborative Stakeholder funded by Universities Wales, **Universities UK**. Amount **GBP 5000**.
- Won Petar Beron Postdoctoral Fellowship Grant in the Competition under the National Scientific Program "Petar Beron i NIE" (P. Beron) 2021 by Ministry of Education and Science of Bulgaria and the Bulgarian National Science Fund, **BULGARIA**. Amount **120,000 BGN**.

Abroad Universities/Schools/Industries Visited

- Institute of Robotics, Bulgarian Academy of Sciences, Bulgaria.
- Grenoble INP-Gene Industriel Laboratoire, G-SCOP Laboratory, University of Grenoble Alpes, France.
- University of Cassino and Southern Lazio, Cassino, Italy.
- Alfaisal University, Riyadh, Saudi Arabia.
- Technical University of Gabrovo, Gabrovo, Bulgaria.
- South-West University, Neofit Rilski, Blagoevgrad, Bulgaria.
- University Medical Center, N. I. Pirogov Hospital, Sofia, Bulgaria.
- British School of Sofia, Sofia, Bulgaria.
- 148 Primary School "Prof. Lyubomir Miletich", Slatina, Bulgaria.
- IBM, Sofia, Bulgaria.

Programs Conducted

- Conducted 3-day training program on "LabVIEW Core 1 and Core 2".
- Conducted one-day workshop on "Modelling of Multidisciplinary Dynamic systems".
- Conducted an international conference on "Industry 4.0 - An Ensemble of Transpiring Cyber Physical Systems, Impact on Smart Connected Manufacturing Systems".
- Conducted one-day workshop on "Renewable Sources of Energy and Its Utilization".
- Conducted one-day workshop on "Business Transformation using Artificial Intelligence and Machine Learning".
- Conducted "Internal Hackathon for Smart India Hackathon 2010".
- Organized a Guest lecture on "Overview of SAP and its Role in Industrial Automation".

Products/Prototypes Developed

- A3-UPU Spherical Parallel Manipulator for Rehabilitation in Stroke Patients.
<https://www.youtube.com/watch?v=o1WaEime24A>
- A 3UPS/S Spherical Parallel Manipulator Designed for Robot-Assisted Rehabilitation after Stroke.
<https://www.youtube.com/watch?v=Tne9NvoDU0s>
- A bilateral stand-alone robotic motion-assisted fingered exoskeleton for home rehabilitation.
<https://www.youtube.com/watch?v=Flyx2x1G-cM>
- A soft robot for rehabilitating the fingers of a stroke patient.
<https://sites.google.com/view/tonypunnoosevalayil/my-robots>
- Network connected spatial Bennett mechanisms for saddle roof of buildings.
<https://www.mechanika.ktu.lt/index.php/Mech/article/view/22527>
- A Robot Fish for patrol.
<https://www.youtube.com/watch?v=wcWwdxqpy0U>
- A swing check valve using Hall Effect Sensor.
<https://www.youtube.com/shorts/2cvhhrPAX6o>
<https://www.youtube.com/watch?v=LEOdiYcTljc>
- A robot for feeding zoo animals.
<https://www.youtube.com/watch?v=sebNLYAqijA>
- Different Straight line mechanisms.
<https://www.youtube.com/watch?v=1CsRuSSuX0o>
- Wild animal tranquilizer using hexapod robot.
<https://www.youtube.com/watch?v=VO6fshHbPyg>
- A 3RRR soft robot with soft joints and links.

Memorandum of Understanding (MoU)

- Initiated and facilitated a MoU between Coimbatore Institute of Technology, Coimbatore, and Kovai Classic Industries (KCI), Coimbatore.
- Initiated and facilitated a MoU between Coimbatore Institute of Technology, Coimbatore, and Rabwin Industries Private Limited, Coimbatore.

Teaching Courses

- Statics and Dynamics.
- Engineering Mechanics for Mechanical Engineers.
- Mechanisms and Machines.
- Kinematics of Machinery.
- Dynamics of Machines.
- Control Theory and Mechatronics.
- Advanced Industrial Automation Systems.
- MATLAB Programming.
- Dynamics and Control of Manipulators.
- Engineering Graphics.
- Mechatronics Laboratory.
- Dynamics Laboratory.