

Rahul Kala

Work

Assistant Professor, (2014-present)
Robotics and Artificial Intelligence Laboratory,
Indian Institute of Information Technology Allahabad, India

Education

S. No.	Degree	Board/School/University	Year
1.	PhD in Cybernetics	School of Cybernetics, School of Systems Engineering, University of Reading, UK <i>Thesis: Motion Planning for Multiple Autonomous Vehicles</i>	2010-2013
2.	BTech (IT) + MTech (IT) (5-year Integrated)	Indian Institute of Information Technology and Management Gwalior, India <i>Thesis: Robotic Path Planning using Artificial Intelligence and Soft Computing Techniques</i>	2005-2010
3.	All India Senior School Certificate Examination (Class XII)	Maheshwari Public School, Jaipur Central Board of Secondary Education, India	2005
4.	All India Senior School Examination (Class X)	St. Paul's School, Gwalior Central Board of Senior Secondary Education, India	2003

Areas of Research

- Mission Planning for mobile robots
- Robot Motion Planning
- Intelligent Vehicles and Intelligent Transportation Systems
- Neural Networks, Evolutionary Algorithms, Hybrid Soft Computing
- Pattern Recognition and Classification

Scholarships and Awards

- First Prize in Best PhD Dissertation award by the IEEE Intelligent Transportation Systems Society worth USD \$1,000. Awarded at the 2014 IEEE Intelligent Transportation Systems Conference at Qingdao, China.
- Commonwealth 2010 (UK) scholarship for pursuing PhD at the University of Reading, UK, approximately worth £71,000.
- Travel grant for attending 2012 IEEE Intelligent Vehicles Symposium, Alcalá de Henares, Spain, June 3-7, 2012 (sponsored by University of Reading and Commonwealth Scholarship) worth £800.
- Researcher of the Year from the School of Systems Engineering, University of Reading, UK a competition for 3rd year PhD students; nominated for the award at the university level, did not win.
- Lord of the Code scholarship (1st prize) from RedHat and Ekalavya, KReSIT, IIT Bombay worth Rs. 2 lacs (as a team).
- GATE scholarship for pursuing MTech worth Rs. 80,000.
- As an undergraduate student, numerous awards in software, programming and related contests.

Funded Projects

- Funded project entitled Mission Planning using Sampling based Techniques as Principle Investigator from the Department of Science and Technology, Government of India for Rs. 39,28,766

Selected Publications

Statistics

Year	Books	Journals (SCI)	Journals (Others)	Conferences/ Book Chapters	Patents: 1 (2011, Submitted)
2016	1	3	3	3	
2015		2	3	3	Video Lectures: 2 (2010, 2013)
2014		5		1	
2013	1	5	1	1	National Journals: 2 (2009 each)
2012		1	3	1	
2011		2	6	4	National Conferences: 1 (2009)
2010	2	2	11	7	
2009		1	1	9	
2008			2	1	
Total	4	21	30	30	91

Authored Books

- R. Kala (2016) *On-Road Intelligent Vehicles: Motion Planning for Intelligent Transportation Systems*, Elsevier, Waltham, MA.
- R. Tiwari, A. Shukla, R. Kala (2013) *Intelligent Planning for Mobile Robotics: Algorithmic Approaches*, IGI Global Publishers, Hershey, PA.
- A. Shukla, R. Tiwari, R. Kala (2010) *Real Life Applications of Soft Computing*, CRC Press, Boca Raton, FL.
- A. Shukla, R. Tiwari, R. Kala (2010) *Towards Hybrid and Adaptive Computing: A Perspective*, Studies in Computational Intelligence, Springer-Verlag Berlin, Heidelberg.

Video Lectures

- R. Kala (2010) *Video Lecture of Soft Computing (39 Hour Video Lecture Series)*, Soft Computing and Expert System Laboratory, IIITM Gwalior, India. Available at: <http://rkala.in/softcomputingvideos.php>
- R. Kala (2013) *Motion Planning for Multiple Autonomous Vehicles (14 videos/13 hours Video Lecture Series)*, School of Cybernetics, School of Systems Engineering, University of Reading, UK. Available at: <http://rkala.in/autonomousvehiclesvideos.php>

International Journals – SCI

- R. Kala (2016) Homotopic Roadmap Generation for Robot Motion Planning, *Journal of Intelligent and Robotic Systems*, 82(3): 555–575.
- R. Kala (2016) Reaching destination on time with cooperative intelligent transportation systems, *Advanced Transportation* 50(2): 214–227.
- R. Kala (2016) Homotopy conscious roadmap construction by fast sampling of narrow corridors, *Applied Intelligence*, 45(4): 1089-1102.
- R. Kala, K. Warwick (2015) Congestion Avoidance in City Traffic. *Journal of Advanced Transportation*, 49(4): 581–595.
- R. Kala, K. Warwick (2015) Intelligent Transportation System with Diverse Semi-Autonomous Vehicles, *International Journal of Computational Intelligent Systems*, 8(5): 886-899.
- R. Kala, K. Warwick (2014) Dynamic Distributed Lanes: Motion Planning for Multiple Autonomous Vehicles. *Applied Intelligence*, 41(1): 260-281.

- R. Kala (2014) Navigating Multiple Mobile Robots without Direct Communication. *International Journal of Intelligent Systems*, 29(8): 767–786.
- R. Kala, K. Warwick (2014) Heuristic based evolution for the coordination of autonomous vehicles in the absence of speed lanes. *Applied Soft Computing*, 19: 387–402.
- R. Kala (2014) Coordination in Navigation of Multiple Mobile Robots. *Cybernetics and Systems*, 45(1): 1-24.
- R. Kala, K. Warwick (2014) Computing Journey Start Times with Recurrent Traffic Conditions. *IET Intelligent Transport Systems*, 8(8): 681 – 687.
- R. Kala, K. Warwick (2013) Planning Autonomous Vehicles in the Absence of Speed Lanes using an Elastic Strip. *IEEE Transactions on Intelligent Transportation Systems*, 14(4): 1743-1752.
- R. Kala, K. Warwick (2013) Multi-Level Planning for Semi-Autonomous Vehicles in Traffic Scenarios based on Separation Maximization. *Journal of Intelligent and Robotic Systems*, 72(3-4): 559-590.
- R. Kala, K. Warwick (2013) Motion Planning of Autonomous Vehicles in a Non-Autonomous Vehicle Environment without Speed Lanes. *Engineering Applications of Artificial Intelligence*, 26(5-6): 1588–1601.
- R. Kala (2013) Rapidly-exploring Random Graphs: Motion Planning of Multiple Mobile Robots. *Advanced Robotics*, 27(14): 1113-1122.
- R. Kala (2013) Multi-Robot Motion Planning using Hybrid MNHS and Genetic Algorithms. *Applied Artificial Intelligence*, 27(3): 170-198.
- R. Kala (2012) Multi-Robot Path Planning using Co-Evolutionary Genetic Programming. *Expert Systems With Applications*, 39(3): 3817-3831.
- R. Kala, A. Shukla, R. Tiwari (2011) Robotic path planning in static environment using hierarchical multi-neuron heuristic search and probability based fitness. *Neurocomputing*, 74(14-15): 2314-2335.
- R. Kala, A. Shukla, R. Tiwari (2011) Robotic Path Planning using Evolutionary Momentum based Exploration. *Journal of Experimental and Theoretical Artificial Intelligence*, 23(4): 469-495.
- R. Kala, A. Shukla, R. Tiwari (2010) Fusion of probabilistic A* algorithm and fuzzy inference system for robotic path planning. *Artificial Intelligence Review*, 33(4): 275-306.
- R. Kala, A. Shukla, R. Tiwari (2010) Dynamic Environment Robot Path Planning using Hierarchical Evolutionary Algorithms. *Cybernetics and Systems*, 41(6): 435-454.
- R. Kala, A. Shukla, R. Tiwari (2009) Self-Adaptive Parallel Processing Neural Networks with irregular Nodal Processing Powers using Hierarchical Partitioning. *Neural Network World*, 19(6): 657-680.

Impact

Citations: 776
h-index: 16
i10-index: 24
 (Source: Google Scholar)

Courses Taken

- Artificial Intelligence for 3rd year undergraduate IT students
- Robot Motion Planning for final year undergraduate and postgraduate students
- Data Structures for 1st year undergraduate students
- Artificial Life Simulations for first year postgraduate students
- Robotics and Industrial Automation for final year undergraduate and post-graduate students

Research Supervision

	Completed	Ongoing
PhD	-	4
MTech	10	5

Lectures and Invited Talks

- Talk on Robotics Programming, Android and Python at 2nd Spell of In-Service Course for PGT (CS) at Kendriya Vidyalaya (25th December and 27th December, 2016).

- Talk on “Mobile Robotics” at Infotsav 2016, the annual techno-management festival of IIITM Gwalior (12th November, 2016).
- Talk on “Towards Apocalypse of Human Driving and Re-Shaping Futuristic Transportation Systems” at TEDxIIITA (31st January, 2016).
- Plenary talk on “Motion Planning for Multiple Autonomous Vehicles” at the annual flagship conference of the IEEE Intelligent Transportation Systems Society in 2014 at Qingdao, China (9th October, 2014).
- Talk on "Motion Planning for Multiple Autonomous Vehicles", at IIT Bombay (13th November, 2014).
- Lecture on “A* algorithm with applications to Robot Path Planning”, at IIITM Gwalior (21st February, 2014).
- Lecture on "Artificial Intelligence: Introduction and Motivation" at B.M.A.S. College of Engineering, Agra (11th August, 2010).
- Lab Instructor for course titled C Programming for 1st year students at IIITM Gwalior (August, 2009 to December, 2009).
- Lectures on Data Structures and Algorithms for training program Training for Professionals, IIITM Gwalior (February, 2009 and October, 2009).

Major Workshops/Conferences Attended

- Japan-East Asia Network of Exchange for Students and Youths (JENESYS) program at different places in Japan from 24th September to 4th October, 2016.
- 2016 IEEE World Congress on Computational Intelligence, Vancouver, Canada, July 24-29, 2016.
- 17th International IEEE Conference on Intelligent Transportation Systems, Qingdao, China, October 8-11, 2014.
- 2012 IEEE Intelligent Vehicles Symposium, Alcalá de Henares, Spain, June 3-7, 2012.
- 10th IEEE International Conference on Cybernetic Intelligent Systems, Docklands, London, September 1, 2011.
- Commonwealth, Human Rights and Democracy, Common, Association of Commonwealth Universities, Cumberland Lodge, Windsor, March 11-13, 2011.
- One Day Workshop on "How to get Published in Internationally Referred Journals: A Practical Guide" by Prof. Om Prakash Gupta, College of Business, Prairie View A & M University, USA at IIITM Gwalior, March 27, 2010
- Frontiers of Research on Speech and Music (FRSM 2009) , ITC Sangeet Research Academy, Kolkata; CDAC, Kolkata; Sir C V Raman Centre for Physics and Music, Jadavpur University, Kolkata; BIT Mesra; ABV Indian Institute of Information Technology and Management, Gwalior, Dec 15-16, 2009
- Indo-US Workshop on System of Systems Engineering, Indian Institute of Technology Kanpur, Kanpur, India, Oct 26-28, 2009
- Springer International Conference on Contemporary Computing (IC3), Jaypee Institute of Information Technology University & University of Florida, Noida, India, Aug 17-19, 2009
- IEEE International Advanced Computing Conference (IACC), Patiala, India, March 6-7, 2009
- National Symposium on Acoustics (NSA), Acoustic Society of India (ASI) & Naval Science and Technological Laboratory (NSTL), Vishakapatnam, December 22-24, 2008
- 7 day "National Workshop on Computational Neuroscience" (CNSW-2008), Singhad Institute of Business Administration and Computer Application (SIBACA), Lonavala, 23-28 June, 2008

Administrative Responsibilities

- Member, Network Committee (2016-continue)
- Member, Department Under Graduate Committee (2015-continue)
- Advisor, Technical Council, Student Gymkhana (2015-continue)
- Treasurer, Robotics and Automation Society, UP Section Chapter (2015-continue)

Workshops/Events Organized

- One of the Coordinators for the First SERB Summer School on Robotics, 7-13 June, 2014 held at IIIT Allahabad, sponsored by Science and Engineering Research Board, Department of Science and Technology, Government of India.

- Member, Academic Committee at the Seventh Science Conclave, 8-12 December, 2014 held at IIIT Allahabad.
- Member, Print Committee at the 10th Convocation, 9 November, 2015 held at IIIT Allahabad
- Member, Print Committee at the 11th Convocation, 24 September, 2016 held at IIIT Allahabad

Contact

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Publications

Statistics

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Patents

- R. Tiwari, R. Kala, A. Shukla (2011) Classification using Multi-Model Co-Evolutionary Ensembles. Application No. 68/MUM/2011 [Submitted].

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- R. Kala (2016) Homotopic Roadmap Generation for Robot Motion Planning, *Journal of Intelligent and Robotic Systems*, 82(3): 555–575.
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- R. Kala, A. Shukla, R. Tiwari (2010) Dynamic Environment Robot Path Planning using Hierarchical Evolutionary Algorithms. *Cybernetics and Systems*, 41(6): 435-454.
- R. Kala, A. Shukla, R. Tiwari (2009) Self-Adaptive Parallel Processing Neural Networks with irregular Nodal Processing Powers using Hierarchical Partitioning. *Neural Network World*, 19(6): 657-680.

International Journals - others

- A. Kannan, P. Gupta, R. Tiwari, S. Prasad, A. Khatri and R. Kala (2016) Robot Motion Planning using Adaptive Hybrid Sampling in Probabilistic Roadmaps. *Electronics* 5(2), 16.
- A. Kumar, R. Kala (2016) Linear Temporal Logic-based Mission Planning, *International Journal of Interactive Multimedia and Artificial Intelligence*, 3(7): 32-41.
- S. Kant, R. Kala, R. Tiwari, A. Shukla, S. Kumar (2016) Lip Recognition Using Various Neural Classifiers. *International Journal of Electrical, Electronics and Data Communication*, 4 (10): 86-94.
- R. Kala, K. Warwick (2015) Reactive Planning of Autonomous Vehicles for Traffic Scenarios, *Electronics*, 4(4), 739-762.
- A. Gupta, S. Bhalla, S. Dwivedi, N. Verma, R. Kala (2015) On the Use of Local Search in the Evolution of Neural Networks for the Diagnosis of Breast Cancer, *Technologies*, 3(3): 162-181
- R. Kala, K. Warwick (2015) Motion Planning of Autonomous Vehicles on a Dual Carriageway without Speed Lanes. *Electronics*, 4(1): 59-81.
- C. J. Shackleton, R. Kala, K. Warwick (2013) Sensor-Based Trajectory Generation for Advanced Driver Assistance System. *Robotics*, 2(1): 19-35.
- R. Kala, A. Shukla, R. Tiwari (2012) Robot Path Planning using Dynamic Programming with Accelerating Nodes. *Paladyn Journal of Behavioural Robotics*, 3(1): 23-34.
- R. Kala, A. Shukla, R. Tiwari (2012) Robotic Path Planning using Hybrid Genetic Algorithm Particle Swarm Optimization. *International Journal of Information and Communication Technology*, 4(2-4): 89 – 105.
- R. R. Janghel, R. Tiwari, R. Kala, A. Shukla (2012) Breast Cancer Data Prediction by Dimensionality Reduction Using PCA and Adaptive Neuro Evolution. *International Journal of Information Systems and Social Change*, 3(1): 1-9.
- R. Kala, K. Warwick (2011) Multi-Vehicle Planning using RRT-Connect. *Paladyn Journal of Behavioural Robotics*, 2(3): 134-144.

- R. Kala, A. Shukla, R. Tiwari (2011) Modular Symbiotic Adaptive Neural Evolution for High Dimensional Classificatory Problems. *Intelligent Decision Technologies*, 5(4): 309-319.
- R. Kala, A. Shukla, R. Tiwari (2011) A Novel Approach to Classificatory problem using Neuro-Fuzzy Architecture. *International Journal of Systems, Control and Communications*, 3(3): 259-269.
- R. Kala, R. Tiwari, A. Shukla (2011) Breast Cancer Diagnosis using Optimized Attribute Division in Modular Neural Networks. *Journal of Information Technology Research*, 4(1): 34-47.
- R. Kala, R. R. Janghel, R. Tiwari, A. Shukla (2011) Diagnosis of Breast Cancer by Modular Evolutionary Neural Networks. *International Journal of Biomedical Engineering and Technology*, 7(2): 194 – 211.
- A. Tripathi, P. Gupta, A. Trivedi, R. Kala (2011) Wireless Sensor Node Placement using Hybrid Genetic Programming and Genetic Algorithms. *International Journal of Intelligent Information Technologies*, 7(2): 63-83.
- R. Kala, A. Shukla, R. Tiwari (2010) Evolving Robotic Path with Genetically Optimized Fuzzy Planner. *International Journal of Computational Vision and Robotics*, 1(4): 415-429.
- R. Kala, A. Shukla, R. Tiwari (2010) Clustering Based Hierarchical Genetic Algorithm for Complex Fitness Landscapes. *International Journal of Intelligent Systems Technologies and Applications*, 9(2): 185-205.
- R. Kala, A. Shukla, R. Tiwari (2010) Hierarchical Evolutionary Strategy for Complex Fitness Landscapes. *Journal of Information Science and Technology*, 7(2): 36-57.
- R. Kala, H. Vazirani, N. Khawalkar, M. Bhattacharya (2010) Evolutionary Radial Basis Function Network for Classificatory Problems. *International Journal of Computer Science Applications*, 7(4): 34-49.
- R. Kala, H. Vazirani, A. Shukla, R. Tiwari (2010) Medical Diagnosis using Incremental Evolution of Neural Network. *Journal of Hybrid Computing Research*, 3(1): 9-17.
- R. Kala, H. Vazirani, A. Shukla, R. Tiwari (2010) Evolution of Modular Neural Network in Medical Diagnosis. *International Journal of Applied Artificial Intelligence in Engineering System*, 2(1): 49 -58.
- R. Kala, H. Vazirani, A. Shukla, R. Tiwari (2010) Offline Handwriting Recognition using Genetic Algorithm. *International Journal of Computer Science Issues*, 7(2): 16-25.
- R. Kala, A. Shukla, R. Tiwari (2010) A Novel Approach to Classificatory Problem using Grammatical Evolution based Hybrid Algorithm. *International Journal of Computer Applications*, 1(28): 61-68.
- A. Tarsauliya, S. Kant, R. Kala, R. Tiwari, A. Shukla (2010) Analysis of Artificial Neural Network for Financial Time Series Forecasting. *International Journal of Computer Applications*, 9(5): 16–22.
- R. Kala, A. Shukla, R. Tiwari (2010) A Novel Approach to Clustering using Genetic Algorithm. *International Journal of Engineering Research and Industrial Applications*, 3(1): 81-88.
- H. Vazirani, R. Kala, A. Shukla, R. Tiwari (2010) Use of Modular Neural Network for Heart Disease. *International Journal of Computer and Communication Technology*, 1(2-4): 88-93.
- A. Shukla, R. Tiwari, R. Kala (2009) Mobile Robot Navigation Control in Moving Obstacle Environment using Genetic Algorithms and Artificial Neural Networks. *International Journal of Artificial Intelligence and Computational Research*, 1(1): 1-12.
- A. Shukla, R. Kala (2008) Multi Neuron Heuristic Search. *International Journal of Computer Science and Network Security*, 8(6): 344-350.
- A. Shukla, R. Kala (2008) Predictive Sort. *International Journal of Computer Science and Network Security*, 8(6): 314-320.

International Conferences

- R. Kala (2016) Sampling based mission planning for multiple robots. In *Proceedings of the 2016 IEEE Congress on Evolutionary Computation*, Vancouver, BC, Canada, pp. 662-669.
- S. M. H. Jafri, Rahul Kala (2016) Path Planning of a Mobile Robot in Outdoor Terrain, In *Intelligent Systems Technologies and Applications Vol. 2*, Springer, pp. 187-195.
- A. Kumar, R. Agarwal, R. Kala (2016) Temporal Logic based Motion Planning in Unstructured Environments. In *Proceedings of the International Conference on Computing in Mechanical Engineering*, Kochi, India, pp. 14-22.
- A. Sharma, I. Wadhwa and R. Kala (2015) Monocular camera based object recognition and 3D-localization for robotic grasping. In *Proceedings of the 2015 International Conference on Signal Processing, Computing and Control*, Waknaghat, pp. 225-229.
- P. Mohan, S. Srivastava, G. Tiwari, R. Kala (2015) Background and skin colour independent hand region extraction and static gesture recognition. In *Proceedings of the 2015 Eighth International Conference on Contemporary Computing*, Noida, India, pp.144-149.
- A. Kumar, R. Kala (2015) Geometric shape drawing using a 3 link planar manipulator. In *Proceedings of the 2015 Eighth International Conference on Contemporary Computing*, Noida, India, pp. 404-409.

- V. Kumar, G. C. Nandi, R. Kala (2014) Static Hand Gesture Recognition using Stacked Denoising Sparse Autoencoders, In *Proceedings of the 2014 Seventh International Conference on Contemporary Computing*, Noida, India, pp. 99 - 104.
- R. Kala, K. Warwick (2012) Planning autonomous vehicles in the absence of speed lanes using lateral potentials. In *Proceedings of the 2012 IEEE Intelligent Vehicles Symposium*, Alcalá de Henares, Spain, pp. 597-602.
- R. Kala, K. Warwick (2011) Planning of Multiple Autonomous Vehicles using RRT. In *Proceedings of the 10th IEEE International Conference on Cybernetic Intelligent Systems*, Docklands, London, pp. 20-25.
- A. Tarsauliya, R. Kala, R. Tiwari, A. Shukla (2011) Financial Time Series Forecast Using Neural Network Ensembles. In *Proceedings of the International Conference on Swarm Intelligence, Springer Lecture Notes in Computer Science*, Chongqing, China, pp. 480- 488.
- A. Tarsauliya, R. Kala, R. Tiwari, A. Shukla (2011) Financial Time Series Volatility Forecast Using Evolutionary Hybrid Artificial Neural Network. In *Proceedings of the Fourth International Conference on Network Security & Applications*, Chennai, India, pp. 463-471.
- R. R. Janghel, A. Shukla, R. Tiwari, R. Kala (2010) Intelligent Decision Support System for Breast Cancer. In *Proceedings of the International Conference on Swarm Intelligence, Springer Lecture Notes in Computer Science*, Beijing, China, pp. 351-358.
- R. Kala, H. Vazirani, A. Shukla, R. Tiwari (2010) Fusion of Speech and Face by Enhanced Modular Neural Network. In *Proceedings of the Springer International Conference on Information Systems, Technology and Management*, Bangkok, Thailand, pp. 363-372.
- Y. K. Meena, K. V. Arya, R. Kala (2010) Classification using Redundant Mapping in Modular Neural Networks. In *Proceedings of the 2010 IEEE World Congress on Nature and Biologically Inspired Computing*, Fukuoka, Japan, pp. 554 – 559.
- R. R. Janghel, A. Shukla, R. Tiwari, R. Kala (2010) Breast Cancer Diagnostic System using Symbiotic Adaptive Neuro-evolution (SANE). In *Proceedings of the 2010 IEEE International Conference of Soft Computing and Pattern Recognition*, Cercy Pontoise/Paris, France, pp. 326-329.
- R. R. Janghel, A. Shukla, R. Tiwari, R. Kala (2010) Breast Cancer Diagnosis using Artificial Neural Network Models. In *Proceedings of the 3rd IEEE International Conference on Information Sciences and Interaction Sciences*, Chengdu, China, pp. 89-94.
- H. Vazirani, R. Kala, A. Shukla, R. Tiwari (2010) Diagnosis of Breast Cancer by Modular Neural Network. In *Proceedings of the Third IEEE International Conference on Computer Science and Information Technology*, Chengdu, China, pp. 115-119.
- A. Shukla, R. Tiwari, A. Ranjan, R. Kala (2009) Multi Lingual Character Recognition using Hierarchical Rule Based Classification and Artificial Neural Network. In *Proceedings of the Sixth International Symposium on Neural Networks, Springer Verlag Lecture Notes in Computer Science*, Wukan, China, pp. 821–830.
- R. Kala, A. Shukla, R. Tiwari (2009) Fusion of Evolutionary Algorithms and Multi-Neuron Heuristic Search for Robotic Path Planning. In *Proceedings of the 2009 IEEE World Congress on Nature & Biologically Inspired Computing*, Coimbatore, India, pp. 684 – 689.
- R. Kala, A. Shukla, R. Tiwari (2009) Comparative analysis of intelligent hybrid systems for detection of PIMA Indian diabetes. In *Proceedings of the 2009 IEEE World Congress on Nature & Biologically Inspired Computing*, Coimbatore, India, pp. 947 – 952.
- R. Kala, A. Shukla, R. Tiwari (2009) Robotic Path Planning using Multi Neuron Heuristic Search. In *Proceedings of the ACM 2nd International Conference on Interaction Sciences: Information Technology, Culture and Human*, Seoul, Korea, pp. 1318-1323.
- R. Kala, A. Shukla, R. Tiwari (2009) Optimized Graph Search using Multi Level Graph Clustering. In *Proceedings of the Springer International Conference on Contemporary Computing*, Noida, India, pp. 103-114.
- R. Kala, A. Shukla, R. Tiwari (2009) Fuzzy Neuro Systems for Machine Learning for Large Data Sets. In *Proceedings of the IEEE International Advanced Computing Conference*, Patiala, India, pp. 541-545.
- R. Kala, A. Shukla, R. Tiwari (2009) Fast Learning Neural Network using modified Corners Algorithm. In *Proceedings of the IEEE Global Congress on Intelligent System*, Xiamen, China, pp. 367-373.
- R. Kala, A. Shukla, R. Tiwari, S. Rungta, R. R. Janghel (2009) Mobile Robot Navigation Control in Moving Obstacle Environment using Genetic Algorithm, Artificial Neural Networks and A* Algorithm. In *Proceedings of the IEEE World Congress on Computer Science and Information Engineering*, Los Angeles/Anaheim, USA, pp. 705-713.
- R. Kumar, R. Ranjan, S. K. Singh, R. Kala, A. Shukla, R. Tiwari (2009) Multilingual Speaker Recognition Using Neural Network. In *Proceedings of the Frontiers of Research on Speech and Music*, Gwalior, India, pp. 1-8.

- A. Shukla, R. Tiwari, R. Kala (2008) Mobile Robot Navigation Control in Moving Obstacle Environment using A* Algorithm. In *Proceedings of the International conference on Artificial Neural Networks in Engineering*, ASME Publications, St. Louis, Missouri, pp. 113-120.

Book Chapters

- R. Kala, A. Shukla, R. Tiwari (2013) Breast Cancer Diagnosis Using Optimized Attribute Division in Modular Neural Networks. In *Interdisciplinary Advances in Information Technology Research*, IGI Global, Chapter 3, Hershey, PA, pp. 34-47.
- R. Kala, A. Shukla, R. Tiwari (2011) Handling Large Medical Data Sets for Disease Detection. In *Biomedical Engineering and Information Systems: Technologies, Tools and Applications*, IGI Global, Chapter 8, Hershey, PA, pp. 162-176.
- R. Kala, A. Shukla, R. Tiwari (2010) Hybrid Intelligent Systems for Medical Diagnosis. In *Intelligent Medical technologies and Biomedical Engineering: Tools and Applications*, IGI Global, Chapter 9, Hershey, PA, pp. 187-202.

Nationals

- A. Shukla, R. Tiwari, H. K. Meena, R. Kala (2009) Speaker Identification using Wavelet Analysis and Modular Neural Networks. *Journal of Acoustic Society of India*, 36(1): 14-19.
- A. Shukla, R. Tiwari, H. K. Meena, R. Kala (2009) Speaker Identification using Wavelet Analysis and Artificial Neural Networks. *Journal of Acoustic Society of India*, 36(1): 20-25.
- A. Shukla, R. Tiwari, H. K. Meena, R. Kala (2009) Speaker Identification using Wavelet Analysis and Modular Neural Networks. In *Proceedings of the National Symposium on Acoustics*, Vishakhapatnam, India, pp. 125-130.

Research Supervision

PhD

- Venkat Beri (Ongoing)
- Vaibhav Malviya (Ongoing)
- Lhilo Kenye (Ongoing)
- Sayed Mohammad Haider Jafri (Ongoing)

MTech

- Ashish Chhonkar (2015)
- Aashna Sharma (2015)
- Anil Kumar (2015)
- Ishant (2015)
- Sayed Mohammad Haider Jafri (2015)
- Lhilo Kenye (2016)
- Ayush Goyal (2016)
- Aayushi Nautiyal (2016)
- Adarsh Suresan (2016)
- Vineet Shaily (2016)
- Naveen Mittal (Ongoing)
- Himanshu Vimal (Ongoing)
- Deeksha Saxena (Ongoing)
- Sonaxi Setia (Ongoing)
- Abhinand T M (Ongoing)

Review Assignments and Program Committees

SCI Journals

- IEEE Transactions on Systems, Man, and Cybernetics – Part B
- IEEE Transactions on Systems, Man, and Cybernetics – Part C
- IEEE Transactions on Cybernetics
- IEEE Transactions on Systems, Man and Cybernetics: Systems
- IEEE Transactions on Intelligent Transportation Systems
- IEEE Transactions on Mechatronics
- IEEE Transactions on Automation Science and Engineering
- Robotics and Autonomous Systems
- Journal of Intelligent and Robotic Systems
- Robotica
- Advanced Robotics
- Neurocomputing
- International Journal of Humanoid Robotics
- Robotics and Computer Integrated Manufacturing
- Behaviour & Information Technology
- Pattern Recognition Letters
- Engineering Applications of Artificial Intelligence
- Applied Soft Computing
- International Journal of Advanced Robotic Systems
- Neural Computing and Applications
- Artificial Intelligence Review
- ISA Transactions
- Mathematical Problems in Engineering
- ETRI Journal
- IET Radar, Sonar and Navigation
- Computer Methods and Programs in Biomedicine
- Computational and Applied Mathematics

Government Funding Agencies

- GACR - Czech Science Foundation
- Science and Engineering Research Board, Department of Science and Technology
- Board of Research In Fusion Science & Technology, Nuclear Fusion Programme

Other Journals

- Swarm and Evolutionary Computing
- Applied Computing and Informatics
- Intelligent Decision Technologies, IOS Press
- Journal of Zhejiang University Science C (Computers & Electronics)
- Engineering & Technology Reference, IET
- Journal of Computer Engineering and Information Technology, SciTechnol
- Journal of Engineering and Technology Research, Academic Journals
- International Journal of Computer Science Issues
- Journal of the Physical Sciences, Academic Journals
- Journal of Mechanical Engineering Research, Academic Journals
- Information Technology Research Journal, Academic Journals, Resjournals

Books

- Book reviewer for Elsevier
- Book reviewer for McGraw Hill Education

- Optimizing Assistive Technologies for Aging Population, Y. Morsi, A. Shukla, C. P. Rathore (Eds.), IGI Global Publishers, Hershey, PA, 2015.

Conferences

- 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems, Daejeon, Korea
- 2015 IEEE RAS International Conference on Humanoid Robots, Seoul, Korea
- 2015 International Symposium on Intelligent Systems Technologies and Applications, Aluva, Kerala, India
- 4th International Conference on Advances in Computing, Communications and Informatics, Aluva, Kerala, India
- 7th International conference on Intelligent Human Computer Interaction, 2015, Allahabad, India
- IEEE UPCON 2015, Allahabad, India
- 2013 International Conference on Unmanned Aerial Systems (ICUAS-2013), IEEE, Atlanta, Georgia, USA
- United Kingdom Automatic Control Council Control 2012 Conference (UKACC-Control), Cardiff, UK
- Eighth Conference on Simulated Evolution and Learning (SEAL-2010), Springer, Kanpur, India (Program Committee Member)
- Fifth International Conference on Information Systems, Technology and Management (ICISTM-2011), Springer, Gurgaon, India (Program Committee Member)
- First International Workshop on Semantic Applied Technologies on Biomedical Informatics (SATBI 2011), Chicago, IL, U.S.A. (Program Committee Member)
- 2010 International Conference on Life System Modeling and Simulation & 2010 International Conference on Intelligent Computing for Sustainable Energy and Environment, Springer (LSMS & ICSEE 2010), Wuxi, China
- 2009 IEEE Global Congress on Intelligent Systems (GCIS 2009), IEEE, Xiamen, China.