

*Advances in*

**ICT & Knowledge Management**

*In Cyber Space*



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# **ICT & Knowledge Management**

*In Cyber Space*

— *Editors* —

**P.K. Paul**

**P.S. Aithal**

**Krishna Prasad K.**

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## **An Editorial Note**

### ***ICT Utilizations in the Agriculture Emphasizing Agricultural Robots***

Robotic applications are important and emerging in diverse areas of Agricultural Sectors and not only applicable in harvesting and picking even in accuracy and speed enhancement in the agricultural systems. In recent past the growth of Agricultural Informatics is noticeable and within this branch Agro Robots is important for improving the size of yields even helps in reducing the waste from crops. Agricultural Informatics helps in finding a location and to get product irrespective and it is helpful in managing dust, temperature, movement of the wind and ultimately Robotic applications helps in the agricultural industry with proper automation. Many future demands regarding the food sector may positively solved by robotic applications. Robotics is useful in pre and post production of agriculture and offers following benefits—

- ☐ Regarding the enhancement of the agricultural efficiency
- ☐ In enhancing and developing the productivity and amount
- ☐ Reducing basic and proper production cost
- ☐ In Minimizing in manual labor and HR cost in Agricultural Sectors
- ☐ In proper and higher scale of Industrial development
- ☐ In enhancing proper and modern harvesting related affairs
- ☐ In healthy and adequate manpower involvement in agro and allied areas.

Agricultural robots are useful in contemporary role in the agricultural robots and here artificial intelligence is emergently applied in food crises and regarding the future food demand management. For the worldwide growing population Agricultural robots utilizations is

important; directly and indirectly. Not only in the developed countries even in the developing countries as well the Agricultural robots uses are noticeable these days and a study reveals that Agricultural robots and allied systems may help in reaching up to \$ 35 billion within 2025. As far as traditional farming is concerned the efficiencies many ways possible by the Agricultural robots. There are ample benefits possible using Agricultural robots and AI such as—

- ☐ Regarding Planting
- ☐ Regarding Seeding of the Corps
- ☐ Regarding Monitoring and Managing Corps
- ☐ Fertilization Affairs
- ☐ Weeding of the Corps
- ☐ Proper Harvesting
- ☐ In Thinning and Pruning
- ☐ Intelligent Tractors and Transportation
- ☐ In Shepherd and Herding
- ☐ In Process of Milking

Agricultural robots are having different kinds of characteristics and concern and among these few important are include Agricultural robots are costly and thus it may be an important issue in developing countries and therefore proper initiative is expected by the Government, departments, agro firms, NGOs and Charitable Trust, etc. Regarding research and development undertaken in these areas are still limited. As far as proper manpower is concerned in this field, it is still limited and therefore formal education, training programs, etc. be developed and even short term workshop, training may be organized for the benefits of the cultivators and agro professionals. Proper maintenance in Agricultural robots are highly solicited in proper effective uses and also for better productivity. Therefore it should an important step in developing the Agricultural robot applications not only in developed countries but also in developing countries. Due to the effective role of agricultural robots proper business scale may be reached accordingly Environmental monitoring and management

should be also an important concern and such aspects should be the prime important in Advances in ICT and Knowledge Management for overall and sustainable development along with other emerging and advances issues, tools in IT and Computing.

— *Editors*

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## About the Editors



**Dr. P.K. Paul**, *PhD IIST Shibpur, PDFC (EIS), FBSS, FIARA*  
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**Dr. P.K. Paul** is working as an Executive Director, MCIS & Assistant Professor, Dept. of Computer & Information Sciences. He also holds the additional position of Information Scientist of the Raiganj University. He is associated as Honorary Professor of Logos University Int., Louisiana, USA (and Campus at Brazil, South America; Serbia, Europe & worldwide Online Operations). Dr. Paul holds Ph.D. Information Science and Technology (IST) from India's premier & oldest Public Engineering Institute IIST Shibpur (An Institute of National Importance), M. Tech (By Research) in Information Science and Technology, MS (By Research) in Information Assurance and IT Management, M.Sc. (Double), MBA-InfoSys, is actively engaged in the research and academic activities in the field of IST and Engineering Sciences related with Information Processing and Management. He has been associated with Raiganj University, Raiganj, West Bengal for the teaching and learning activities. He is also CEO and VP of IST Foundation. Virtually he is among the few Indian Information Science professional who holds Post Graduate Qualification in all the dimensions of Information Sciences; ranging from Computer Sciences, Management Science, Information Studies and Information



Technology. He is in favor on starting programs and specialization in emerging IT & Computing subjects that are applied and having social and business touch. He was engaged as consultant for designing country's first MBA-Information Management programme for VMS University, Sikkim. He is also mastermind for designing India's first interdisciplinary Masters (MSc) program on computing i.e. MSc-Computer & Information Science based on principles of interaction of information-technology-people. The first of its kind program already been started in the Government University RGU, India. He has credited many writing/research first and few among the Indian Researcher which including; first research/ policy paper on Cloud Computing Applications in Information Science, Systems, Information Centre/ Green Computing or Green IT in Information Field/ I-Schools aspects/ Usability Engineering in Information Science and Services/ HCI in Information Uses/ Information Science Educational aspects/ [IST]/ Information Scientist/ Geo-Information Science, Quantum Information Science and so on. And he holds 200+ Authored Indexed, Refereed Papers, Articles, Chapters in his credit and about 25 National and International Authored and Edited Books. Moreover, He is Chief Editor of IJASE, New Delhi, India. He is also responsible as a Chief Editor for IJISC, New Delhi, India. He is also involved as Editorial Board Member and Reviewer of more than 100 National and International Journals in diverse field ranging from Computer Science, Informatics, Management, Engineering Science to Education, Social science, Health Science, Pharmacy and so on like Journal of Organizational and End User Computing, International Journal of E-Adoption, International Journal of Web Services Research, International Journal of E-Health and Medical Communications, International Journal of Healthcare Information Systems and Informatics, JECO, IJIRR, IJHCITP, IJOSSP, IJMDEM, IJTHI, IJDET, IJITPM, IJISSCM, IJISSS, IJBDCN, IJWP published from United States, Dubai, India, Nigeria, South Africa and so on.

Moreover he has also performed with several international conferences and event as committee members, chairs, reviewers etc and among these few important are International Conference on Computer and Digital Manufacturing (ICCDM 2017), 4-6<sup>th</sup> May, 2017, Singapore, Fourth International Conference on Artificial Intelligence and Applications (AIAPP 2017), 25-26 March, 2017, Geneva, Switzerland, 5<sup>th</sup> International Conference on Information Technology and Science (ICITS 2017), 25-27 June, 2017, Beijing, China, 2<sup>nd</sup> International Conference on *Information Systems Engineering* (ICISE2017), 1-3 April, 2017, South Carolina, USA, Sixth International Conference on Software Engineering and Applications (SEA-2017), 25-26 March, 2017, Geneva, Switzerland, IND-17 Lisbon, Portugal, 7<sup>th</sup> International BDSM-17, Spain, 5<sup>th</sup> International Conference on Information and Computer Networks (ICICN 2017) 26-28<sup>th</sup> February, 2017, Bangkok, Thailand, 8<sup>th</sup> International Conference on ICT: Big Data, Cloud and Security (ICTBDCS 2017), 21-22 August, 2017, Singapore and other 50+ reputed International events. He was also served in various visiting, invited and guest position in various events and few important are ICRDSTHM-17, Kuala Lumpur, Malaysia 28-29<sup>th</sup> April, 2017, NSETRAR-17, Tamil Nadu, India, ICIRHT-17 etc. He has performed many Invited Talk in leading and reputed academic and industrial establishments' viz. SRM University, Sikkim University, VIT University, Srinivas University, Mangalore University, TCG Digital, CloudNet India. He has received many Awards and Fellow position such as Best Researcher Award in Information Sciences (from IARA, Trichy), David Clark Blair Young Scientist Award in Computer & Information Science (from BSS, India), International Young Scientist Award (from ISROSET) for the contribution in Health Informatics, Citation Award (from SSCET/ Sri Sai University), International Social Science and Digital Society Think Tank Award-2020 and so on.



**Prof. P.S. Aithal**

*Ph.D. (Physics), Ph.D. (Business Management), D.Sc. (Technology Management)*

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**Prof. P. Sreeramana Aithal** has 30 years' experience in Teaching & Research and 20years experience in Administration. Dr. P.S. Aithal currently the FIRST RANK in TOP 12,000 Business Management Authors in the Global Ranking of Elsevier's SSRN (USA) for maximum number of open access Research papers publications in SSRN. He has worked as Principal at Srinivas Institute of Management Studies, Mangalore from 2001-2015. Dr. P.S. Aithal studied his B.Sc. (Physics, Chemistry, & Mathematics) from Poornaprajna College, Udupi during 1985-88. Having four Master degrees in Physics with Electronics, Computer Science, Information Technology, and E-Business, he got his first Ph.D. degree in Physics from Mangalore University in the area of nonlinear optical materials and second Ph.D. degree in Business Management from Manipal University, Manipal, in the area of mobile banking. He worked as Post Doctoral Research Fellow at "Lasers & Quantum Optics Division, Physical Research Laboratory, Ahmedabad for two years from 1999-2000. In the year 2002, he has been selected for the prestigious Oversee Fellowship of Dept. of Science & Technology, Govt. of India – Better Opportunity for Young Scientists in Chosen Area of Science & Technology (BOYSCAST) Fellowship and did Post Doctoral Research at Centre for Research & Education in Optics & Lasers (CREOL), at University of Central Florida, Orlando, U.S.A. During his Post-Doctoral Research at Ahmedabad & USA, he has worked in the area of Nonlinear Optics, Photonics, Optical Limiters and Optical Solitons. Dr. Aithal has got SERC Young Scientist Project on Nonlinear Optics

funded by Dept. of Science & Technology, India. Dr. Aithal also had a visiting Associateship at Physical Research Laboratory, Ahmedabad, and Visiting Professorship of Grimsby Institute of Further & Higher Studies, Grimsby, U.K. He has 50 research publications in refereed International Journals in the area of Nonlinear Optics and Photonics, and 500 in refereed International Journals publications in Technology management, Business Management, and Higher Education. He has presented more than 300 research papers in National & International Conferences/Seminars. Presently he is guiding research scholars for their M.Phil. and Ph.D. degrees in Electronics, Information technology, and business management. Dr. Aithal has developed Teaching Materials in Operations Research, Quantitative Techniques, Research Methodology, Management Information Systems, International Business, Communication networks and Mobile Communication for MBA & MCA Courses. He has also written textbooks on Engineering Physics and Basic Electronics for Engineering Students, which have been published by ACME Publishers, New Delhi. He has research interest in Nonlinear optical absorption, Optical Phase Conjugation, Photorefractive materials, e-business, m-business, ideal business, and nanotechnology business Opportunities. Dr. Aithal is member of World Productivity Council, U.K., member of Strategic Management Forum, India, member of Photonics Society of India, CUSAT, Cochin, senior member of IEDRC.org, Singapore. Dr. P. S. Aithal has edited Twenty Conference Proceedings with ISBN numbers and recently published a book on "Quality in Higher Education" a case study of SIMS. Being a pioneer researcher, Dr. Aithal has developed a new Theory of Organizational Behaviour in 21<sup>st</sup> Century called Theory on Accountability (Theory A). He has also developed a new model for measuring Research productivity called ABC model. He has developed a new Analysis framework for Concepts, ideas, systems, strategies and models called ABCD analysis technique. He has developed and published a new model of nanotechnology commercialization and Analyzing practical systems based on Ideal system Characteristics. Dr. P.S. Aithal obtained D.Sc. Degree recently from Srinivas University for his research on Technology management with the title "Study on Concept of Ideal Systems, Ideal Technology and their Realization

Opportunities Using Information Communication & Computation Technology and Nanotechnology”.

Apart from teaching and research, Dr. Aithal has been involved in institution building activities since 15 years as a team member of Srinivas group and presently there are 18 institutions imparting quality education under Srinivas Group ([www.srinivasgroup.com](http://www.srinivasgroup.com)) and during 2013, Srinivas Group of Institutions became a Private University as Srinivas University and Dr. Aithal has got an opportunity to serve as first Vice-Chancellor of the University. With the successful leadership of Dr. P.S. Aithal, Srinivas Institute of Management Studies has been Ranked #1 among Top International Business Schools other than USA and Ranked #4 among Top World Business Schools including USA in the Total number of research paper publications during 2018 by Elsevier's Social Science Research Network (SSRN), USA.

**Google Scholar:** 800 Articles, Citations - 5,872; H-Index – 37, i-10-Index – 199.

**SSRN:** Full Papers – 540, Citations – 5,100, Top Business Author Ranking – 01.

**Research Gate:** Papers -750, My Readers – 8,68,000, Citations – 7,371. Score – 99% as on 20/08/2021.



**Dr. Krishna Prasad K.**

*M.Sc. (IS), M.Tech. (IT), M.Phil. (CS), Ph. D. (CS),  
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**Dr. Krishna Prasad K.** is belonging to Mangaluru, India born on 25<sup>th</sup> May 1983. He received his M.Sc. (5 years Integrated Course) degree in Information Science from Mangalore University in 2006, M.Phil. Degree in Computer Science from Madurai Kamaraj University in 2009 and M.Tech. in Information Technology from Karnataka State Open University (KSOU) in 2013 and Ph.D. in the field of Biometric Fingerprint Hash code generation methods from Srinivas University in 2018. Since June 2006, he is working in College of Computer and Information Sciences, Srinivas University, City Campus, Pandeshwar, Mangaluru and designated as Assistant Professor in 2014. In December 2018, after the successful completion of Ph.D., he has designated as Associate Professor. He is having 15 years of teaching experience in different Computer Science subjects for BCA and MCA courses.

Currently he is working as Associate Professor in College of Computer and Information Sciences, Srinivas University, Citycampus, Pandeshwar, Mangaluru, India. He has conducted more than 30 Guest Lectures in Vedic Mathematics and Shortcut tricks for Competitive Examinations in and around Dakshina Kannada District of Karnataka State, India. These Guest lecture or workshop includes different aged students from High School Level to Post Graduate level. He has completed Vedic Mathematics certified Professional course with 'O' Grade from Indian Institute of Vedic Maths and Abacus which is approved by central government and National Accreditation Board for Education and Training (NABET) and National Institute for Entrepreneurship and Small Business

Development. His research interest includes Fingerprint Hash Code Generation Methods and Multifactor Authentication Model. He was member of BOE of BCA in Mangalore University for six months in 2013 and for one year in 2017 and Paper setter and Evaluator in Mangalore University. He has received Best Researcher Award-2019, in the International Conference on Recent Trends in Arts, Science, Engineering & Technology organized by International American Council for Research & Development (IACRD) and DK International Foundation.

Dr. Krishna Prasad K. is also serving as coordinator, College of Computer Science and Information Science- Research Council at Srinivas University and effectively guiding 6 Research Scholars for their Doctoral Degree in the field of Computer Science and Applications. He is Senior Member of IEEE and Serving as Branch Counselor of IEEE Srinivas University Student Branch. He has published 75 research papers in referred international journals with more than 125 Google Scholar citations and Ranked 11 in Elsevier SSRN e-library journal papers of last 12 months updated on 01 June 2018. Recently on the basis of Google Scholar citation, he has awarded as Outstanding Scientist Award-2021 in Engineering, Science, and Medicine from VDGGOOD Technology Group. He has also presented more than 50 papers in National and International Conferences. He also authored 3 Books with ISBN number and also authored more than 10 chapters for different books. He is also registered 6 copyrights and published 5 patents along with other authors in IPO and WIPO out of which one Australian patent is granted.



**Dr. Nethravathi, P.S.**

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**Dr. Nethravathi P. Shails** from Mysore, India born on 18th August 1968. She is a post-graduate in Computer Applications and completed her doctorate in the field of Artificial Intelligence and Machine Learning from the Visvesvaraya Technological University, Belagavi. She has also complemented her MBA degree from Sikkim Manipal University. She started her career as a software developer at Mysore for an MNC. She has 24 years of teaching experience from Assistant Lecturer to Head of the Department for the various courses under Mangalore University, RGUHS and VTU since 1997.

She joined Shree Devi Institute of Technology, Department of MCA as a Head of the Department on September 2007. She was instrumental in initiating various activities for first time at SDIT. All of which were a grand success and various activities that she has initiated is still in progress. Under her leadership, MCA department is elevated to the new heights by achieving ranks at the university level several times.

She has been appointed as a Deputy Chief Coordinator for the Digital Evaluation and Deputy Chief coordinator for the Central Digital Evaluation and Scanning Centre for the Mangalore region of Visvesvaraya Technological University (VTU) from 2012-2016. Received appreciation for sense of direction, commitment, responsibility and time management in timely completion of the entire valuation process from the Registrar (Evaluation), Visvesvaraya Technological University, Belagavi.

She has taken various roles in the academic activities of the university. She worked as a committee member for the confidential



work at Visvesvaraya Technological University Examination section during the year 2017. Member of investigation committee of Higher Education Council, Government of Karnataka to make Lateral Entry admission to Master of Computer Applications degree course for Visvesvaraya Technological University colleges during 2016-17. Expert/Content Writer for the Civil Service Examinations of Union Public Service Commission (UPSC), New Delhi from 2016-2019. Served as a Member of Board Of Examination (BOE) of Computer Applications board at VTU several times from 2013 to 2019 and BOS member for M.Phil Programme for the year 2007-08 at Mangalore University, Mangalore. She was nominated as a member of the Local Inquiry Committee at VTU from 2012-2016.

During her tenure, she conducted various external exams at the institute. She was the Deputy Chief Superintendent for National level entrance test conducted by Karnataka Private Post Graduate Colleges' Association (KMAT) for the students of MBA and MCA courses at Shree Devi Institute of Technology for the year 2013-2018. Deputy chief superintendent of PG CET entrance examination test for MBA and MCA courses conducted by Karnataka Examination Authority, Government of Karnataka, at Shree Devi Institute of Technology during the year 2014-15. Deputy Chief superintendent for the COMEDK examination at Shree Devi Institute of Technology for the year 2015 and 2016. Center In-charge for the Recruitment Examination of Nuclear Thermal Power Corporation of India at Shree Devi Institute of Technology on June 2016. Observer for the MESCOM -CAT examination conducted by Karnataka Electricity Board at Shree Devi Institute of Technology for the year 2014-2016. Coordinator for the Indian Institute of Banking and Finance examinations conducted by NSEIT Limited, Mumbai at Shree Devi Institute of Technology from Jan - Dec 2017.

Currently she is working as a Professor in College of Computer and Information Sciences, Srinivas University, Mangalore, India. She has published 8 articles in Scopus indexed journals 30 articles in International Journals. She has presented more than 20 research papers in National and International conference and attended number

of short-term technical courses. She has given several invited talks, keynote addresses and chaired sessions for national and international conferences and seminars. She also authored chapters for various computer related books and published 8 Indian patents and received granting for 3 Australian patents.

She is the life member of Indian Society for Technical Education (ISTE), Indian Society for Training & Development (ISTD), Mangalore and Mangalore Management Association (MMA).

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