



Dr. S. R.KANNAN

Designation : Assistant Professor

Qualification : M.Sc., Ph.D (IIT/M),PDF(ICTP/Italy, NCKU/Taiwan)

Experience : 1998-till date

Specialization : Fuzzy Clustering in Data Analysis, Fuzzy Clustering in Medical Images, Fuzzy Control, Fuzzy Relational Equations, and Application of Fuzzy Set Theory.

Awards and Fellowships

- Received the “ISCA Best Paper Presentation Award” at the 88th Indian Science Congress Association held at New Delhi on January 3-7, 2001 and Cash Award Rs.1000/-
<http://www.iitm.ac.in/academics/achievements.html>
- Received Fellowship (JRF/SRF) through **GATE (Graduate Aptitude Test In Engineering) 97**.
- Awarded a grant in the framework of a joint agreement between the Direzione Generale per la Cooperazione allo Sviluppo of the Italian Ministry of Foreign Affairs and the ICTP Programme for Training and Research in Italian Laboratories, June/2003 – Dec/2004. www.ictp.it
- Awarded a Post Doctoral Fellowship research grant by the NCKU Project of Promoting Academic Excellence & Development World Class Research Centers for doing Post Doctoral Work at NCKU, Taiwan during April 2009 – October 2009. web.ncku.edu.tw
- Awarded research grant by Director General, National Agriculture Research Center, Tsukuba, Japan, for joint research work on remote sensing data to estimate rice (02/06-03/06).
<http://narc.naro.affrc.go.jp/narc-e/index.html>
- Awarded a Grant by DST, and CSIR India, to interact with leading experts in the research topic Fuzzy Clustering in Medical Images at USA.
- Awarded a grant by DST, India <http://www.serc-dst.org/ITS14may2008.pdf>, for delivering a talk on research topic “Fuzzy Clustering in Medical Images”, during an international conference “WCNA 2008”, 2-9, July 2008, Florida University, Florida, USA, <http://research.fit.edu/ifna/wcna2008/>
- Awarded a certificate for having conducted teacher training programme at Kandy by Assistant High Commission of India, Kandy, and Ministry of Education of Central Province, Sri Lanka.21-31Sep, 2007.
- Awarded an appreciation certificate in recognition of my service offered to the Cauvery hostel, Indian Institute of Technology, Madras, as Mess Secretary during the year 1999. www.iitm.ac.in

INTERNATIONAL ASSIGNMENT/ RECOGNITION

Visited Abroad

- **Italy** (06/2003-12/2004) - Research Training (PDF), ICTP, www.ictp.it
- **Japan** (02/2006-03/2006)-Joint Research Work, NARC,
<http://narc.naro.affrc.go.jp/narc-e/index.html>
- **Sri Lanka** (21-31, Sept., 2007) - Resource Person in Mathematics
- **USA** (30-11/July/2008) – Delivering an Invited Talk in WCNA 2008, Florida University, Florida, <http://research.fit.edu/ifna/wcna2008/>
- **Taiwan** (04/2009-10/2009)-Post Doctoral Fellow, NCKU, web.ncku.edu.tw

Membership in higher level academic bodies

- Member in Board of Studies, Dept. of Mathematics, Gandhigram Rural University.
- Member in National Cheng Kung University, Taiwan.
- Member in EUINDIA Grids, Italy.

- Member in ICTP, Italy.
- Member of Indian Mathematical Society.
- Member in Indian Science Congress Association.

Invited Talk/Scientific Interaction

- Title: Fuzzy Clustering in Medical Images, Fifth International Conference on Dynamic Systems and Applications, May30-June 2, 2007, Atlanta, Georgia. USA.
- Title: Applications of Fuzzy Clustering Techniques, WCNA 2008, 2-9, July, 2008, Florida University, Florida, USA. <http://research.fit.edu/ifna/wcna2008/speakers.php>
- Title: Fuzzy Clustering in Medical Images, NWSC-08, UGC-SAP (DRS), 21-27 Jan. 2008, Dept. of Mathematics, Gandhigram University, Gandhigram, Dindigul.
- Jianying Li (NMC Bioinformatics Support) Interacted at Italy for Fuzzy Logic application issues *Clustering*.
- Title: “Fuzzy Set Theory”, on March 5th 2007, Thassim Beevi Abdul Kader college for Women (Affiliated to Alagappa University, Karaikudi), Kilakari, Tamil Nadu. <http://www.thassim.in/students.htm>
- Title: Segmentation of magnetic resonance images using fuzzy clustering analysis, 13/12/2004, Disi, University of Genova, Italy. http://www.disi.unige.it/eventsandseminars/expand-seminar?id_seminar=80

Session Organizer/chair/ Scientific Committee Member

- Requested by the Organization committee of International Conference on Hybrid Intelligent Systems 2002 to be on organizer for the topic “Hybrid Fuzzy Expert Systems”, Universidad de Chile, Chile, USA from December 1 to 4, 2002. <http://tamarugo.cec.uchile.cl/~his02/special.htm>
- Requested by the Organization committee of International Conference on Intelligent System Design and Applications 2003 to be on organizer for the topic “Fuzzy Intelligent Systems Design, August 2003”, Oklahoma, (USA). <http://www.cs.okstate.edu/~isda03/kannan.html>
- Requested by the Organization committee of NCCMM to be on Chair for the topic “Image Processing”, Department of Mathematics, Gandhigram Rural University, India.
- Requested by the Organization committee of “ICGST International Conference on Graphics, Vision and Image processing” to be an International Scientific Committee Member, 19-21 December 2005, Kuwait. <http://www.cba.edu.kw/Abo/GVIP2005/GVIP2005.htm>
- Requested by the Organization committee of Third International Conference on Neural, Parallel & Scientific Computations, Dept. of Mathematics, Atlanta, Georgia, USA to be on Chair for a session, 2006. <http://atlas-conferences.com/cgi-bin/calendar/d/facz34>
- Requested to conduct a session “Recent Trends in Fuzzy Clustering Techniques” during WCNA 2008, 2-9 July, 2008, Florida University, Florida, USA. <http://research.fit.edu/ifna/wcna2008/speakers.php>

Reviewer

- Reviewer for European Journal of Operational Research (Elsevier) <http://www.sciencedirect.com/science/journal>
- Reviewer for IEEE Transactions on Medical Imaging (TMI) www.ieee-tmi.org/
- Reviewer for International Journal of Advanced Mechatronic Systems www.inderscience.com
- Served as scientific reviewer for the international journals of IEEE Trans. On Neural Networks, IEEE Trans. On Fuzzy Systems, International Journal Of Signal Processing, International Journal on Graphics, Vision and Image Processing (GVIP), Journal of Intelligent and Fuzzy Systems. Served as one of the reviewer for scientific papers in First Indian International Conference on Artificial Intelligence (IICAI-03), Hyderabad, INDIA, December 18-20 2003.

<http://www.iiconference.org/iicai03/reviewers.pdf>

- Served as a one of the reviewer for scientific papers in IEEE SMC 2005, October 10-12, Big Island, Hawaii.
- Served as a one of the reviewer for scientific papers in Hybrid Fuzzy Expert Systems, December 1 to 4, 2002, Universidad de Chile, Chile, from December 1 to 4, 2002. <http://tamarugo.cec.uchile.cl/~his02/special.htm>

List of publications

Book

- (2001) Use of Fuzzy Theory to Control Waste Gas Pollution in Environment by Chemical Plants, Dimensions of Pollution, Dr. Ansari, Bhopal [Ed], Vol 1, 111 - 125. (Book Chapters). –ISBN 81-7525-284-7.

Papers published in International Journals

1. (2009) Fuzzy clustering Approach in segmentation of T1 - T2 brain MRI, accepted in International Journal of Recent Trends in Engineering, pp. 157-160, Vol. 2, No. 1-6.
2. (2009) Improved Fuzzy Clustering Segmentation for Medical Images, accepted in International Journal of Neural Network (Science Citation Index Expanded) ISSN: 1210-0552.
3. (2009) Effective Fuzzy Clustering Techniques for Segmentation of Breast MRI, paper published in *International Journal of Soft Computing* (Springer Publication). <http://www.springerlink.com/content/f74n41626651r811/?p=d992d711d7eb4023aafa75aeb4cb8ad9&pi=0> , DOI 10.1007/s00500-009-0528-8, Published online: 01 November 2009.
4. (2009) Fuzzy target selection in direct marketing, *Advances in Fuzzy Sets And Systems (AFSS)*, Vol. 4(3), pp. 313-331, ISSN: 1598 – 5865.
5. (2008) A New Segmentation System for MR Images Based On Fuzzy Techniques, *Applied Soft Computing (Elsevier Publication)*, 8, pp. 1599–1606, ISSN: 1568-4946.
6. (2008) Fuzzy Error Matrix In Classification Techniques, *Journal of Applied Mathematics and Informatics (JAMI)*, Vol. 26, No. 1-5, pp. 861-876, ISSN: 1598 – 5857
7. (2008) Fuzzy Model In Decision Making Of Alternatives, *Advances in Fuzzy Sets And Systems (AFSS)* Vol. 3, Issue 1, pp. 1-19, ISSN: 1598 - 5865
8. (2007) Use of weighted regression for estimating rice yield by satellite data, *International Journal of the Japanese Agriculture Systems Society (JASS)*, Japan, 23(3), pp. 251-261.
9. (2007) Preliminary report on regression equations based on remote sensing data to estimate rice yield, *International Journal of the Japanese Agriculture Systems Society (JASS)*, Japan, 23(2), pp. 177-187.
10. (2005) A New Clustering Algorithm for Segmentation of Magnetic Resonance Images Based on Fuzzy Clustering and Computer Programming, *International Journal on Graphics, Vision and Image Processing (GVIP)*, Vol. 2, pp. 1-8. - ISSN: 1687-3998.
11. (2005) Extended Bidirectional Associative Memories: A Study On Poor Education, Mathematical and Computer Modeling, Vol. 42, Issue ¾, pp.. 389-395, (Elsevier Publication), ISSN: 0895-7177
12. (2003) Fuzzy theory method in the problem of unknown flow-rates in chemical plant, *International Journal of Ultra Scientist of Physical Sciences*, Vol. 15(1), pp 79-90. ISSN: 0970 – 9150.

13. (2003) Optimization of process control variables with the use of hierarchical genetic fuzzy control algorithm, *International Journal of Ultra Scientist of Physical Sciences*, Vol. 15(2), pp. 141-156. ISSN: 0970 – 9150.
14. (2003) Control of the temperature set points in oil refinery using fuzzy expert systems, *International Journal of Ultra Scientist of Physical Sciences*, Vol. 15(3), pp 305- 316. ISSN: 0970 – 9150.

Papers published in Conference Proceedings

1. (2009) *Effective Robust Objective Function of Fuzzy C-Means in Classifying Breast Tissue Regions* presented in the Fourteenth Annual Conference of Gwalior Academy of Mathematical Sciences (GAMS) and Symposium on Computational Mathematics and its application to Engineering, Management and Biology.
2. (2009) *Effective fuzzy c-mean clustering technique for segmentation of T1-T2 brain MRI*, *IEEE CS Digital Library*, pp 537-539, DOI 10.1109/ARTCom.2009.63, IEEE Computer Society.
3. (2009) *Robust Fuzzy C-Means in Classifying Breast Tissue Regions*, *IEEE CS Digital Library* , pp 543-545, DOI 10.1109/ARTCom.2009.46, IEEE Computer Society.
4. (2009) *New Robust Fuzzy C-Means based Gaussian Function in classifying Brain Tissue Regions*, *proceeding of the International Conference on Contemporary Computing, IC3 2009, CCIS 40*, pp. 158–169, 2009, *Published by Springer-Verlag Berlin Heidelberg 2009*. ISSN: 1865-0929. doi:10.1007/978-3-642-03547-0_16.
5. (2009) *Modified Fuzzy C- Means: A new approach on Objective Function in Basic Fuzzy C – Means*, *Accepted for publication in the proceedings of International Conference on Quantitative Methods, Operations and Information Technology*, paper id R7.57.
6. (2009) *New Modified Fuzzy C-Means for Determination of Proper Structure in Data set*, “*Proceeding of the International Conference on Advances in Computing Communication and Control (ICAC3’09)*, *ACM digital library*, pp.177-181, ISBN: 978-1-60558-351-8. <http://doi.acm.org/10.1145/1523103.1523140>
7. (2008) *Fuzzy Clustering Techniques in Analyzing border between tissues in Medical Images*, *Advanced Computing and Communication Technologies for High performance Applications*, Vol. 2, pp. 901-912.
8. (2008) *Effective Fuzzy C-Means Techniques for Finding Structure In Data*, *Advanced Computing and Communication Technologies for High performance Applications*, Vol. 2, pp. 989-1000.
9. (2008) *Fuzzy Clustering Algorithm: A Study on an Objective Function*,” *Proceeding of the 6th International conference on Information Science Technology and Management*, pp. 70-78.
10. (2008) *New Fuzzy Clustering Techniques in Data Analysis*,” *Proceeding of the 1st National Conference on Recent Trends in Computer Science and Information Technology*, 16th August 2008, BCET, Gurdaspur, India, pp. 152 – 156.
11. (2008) *Unsupervised Clustering Techniques: New Approach on Fuzzy C-Means*, *Proceeding of the second international conference on Cognition and Recognition*, Applies Publisher Private Limited, Pages 525-532, ISSN: 978-81-8424-307-9.
12. (2006) *Mathematical Approach For Prediction Of Population Rate Of India*, *Proceedings of Neural, Parallel and Scientific Computation*, Dynamic Publisher, Inc, USA, 3, 2006, pp 93-99. ISSN: 1-890888-02- 8.

13. **(2006)** Estimation Of Rainfall Using Mathematical Methods, *Proceedings of Neural, Parallel and Scientific Computation*, *Dynamic Publisher, Inc, USA*, 3, pp 100-108. ISSN: 1-890888-02-8.
14. **(2002)** Fuzzy Control To Find A Precise Temperature Set Point For Crude Oil In An Oil Refinery, *Combinatorial And Computational Mathematics*, Pages 60-73 –ISBN – 81 – 7319 – 598 – 6.
15. **(2001)** Use of Fuzzy Set Theory to Obtain Temperature Set point of Kerosene in Kalundborg Refinery, *National Conference on 'Challenges of 21st century in Mathematics and its allied topics' 3-4*, University of Mysore, Mysore, B. S. Kiranagi [Ed], Pages 268 –275.
16. **(2000)** Replacement of Algebraic Linear Equations by Fuzzy Relation Equations in Chemical Engineering, *International Conference on Recent Advances in Mathematical Sciences*, 20-22, Indian Institute of Technology, Kharagpur. Published in the proceedings of the conference, "Recent Trends in Mathematical Sciences", J.C. Mishra, and S.B. Sinha [Ed], *Narosa Publishing House*, pages 161 – 168. ISSN: 81 – 7319-405 – X -

Papers Presented in Conferences

- **(2009)**: New Modified Fuzzy C-Means for Determination of Proper Structure in Dataset paper presented in *International Conference on Advances in Computing, Communication and Control (ICAC3'09)*, 23-24 January 2009, Mumbai
- **(2008)**: Modified Fuzzy C-means: A New Approach On Objective Function In Basic Fuzzy C-means on 'First International Conference on Quantitative Method, Operations & Information Technology', 24-25 October, 2008, IBS, Hyderabad.
- **(2008)**: Effective Fuzzy C-Means Techniques For Finding Structure In Data, *International Conference on 'Advanced Computing and Communication Technologies for High performance Applications'*, 24-26, September, 2008, Federal Institute of Science & Technology[FISAT], Ernakulam.
- **(2008)**: Fuzzy Clustering Segmentation Systems for segmentation of breast Contrast- Enhanced MRI, *International Conference on Cognition and Recognition*, Mandya 10-12, April, 2008.
- **(2008)**: New Fuzzy Clustering Techniques in Data Analysis, *1st National Conference on Recent Trends in Computer Science and Information Technology*, 16th August 2008, BCET, Gurdaspur, India.
- **(2008)**: Fuzzy Clustering Algorithm: A Study on an Objective Function, *6th International conference on Information Science Technology and Management 2008*, 31-Aug 2, IIT Delhi, India.
- **(2007)**: *Modified Fuzzy C-Means(FMCM) Based Approach For Computerized Segmentation Of Breast Medical Images*, Paper accepted for paper presentation in *International Conference On Bio-Informatics And Drug Discovery*", 20-22 December, 2007, University of Hyderabad.
- **(2007)**: Fuzzy Segmentation Systems for Brain Medical Images, Paper Presented in *14th National Conference of Vijnana Parishad of India (VPI)(HQ at Orai, UP) and Symposium on Applications of Special Functions (SASF)*. During October 25-27, 2007, Department of Mathematics & Statistics J. N. V. University Jodhpur- 342001(Raj.).
- **(2007)**: Fuzzy clustering Techniques in target selection for direct marketing, Paper accepted for paper presented in *40th Annual Convention On Operation Research*, 4-6 December 2007, INSA, New Delhi, India.
- **(2007)**: Fuzzy C-Means Algorithm for Segmentation of MRI Data, *Fifth international conference on Dynamic Systems and Applications*, May 30-June 2.

- **(2007):** Modified Fuzzy Clustering Techniques: An Analysis of Fat and Parenchyma Tissues in Breast Medical Images, *Fifth World Congress of Nonlinear Analysis*, July 2-9, 2008, Melbourn, Florida.
- **(2007):** Fuzzy Model in decision making of alternatives, “*12th Annual Conference of Gwalior Academy of Mathematical Sciences (GAMS) and All India Symposiums on Computational Biology*” Bhopal.
- **(2005):** Fuzzy Clustering Segmentation System For MR Images, II Indian International Conference On Artificial Intelligent System, 20-22, December, 2005 at Pune.(Invited Paper).
- **(2004):** Comparison of Fuzzy Approach to Error Matrix by Soft or Hard Classifiers, *International Conference on Recent Trends and New Directions of Research in Cybernetics and Systems Theory, IASST*, 1-3 Jan Guwahati, India.
- **(2004):** A New Unsupervised Clustering Algorithm for Segmentation of Magnetic Images, *International Conference on Computational Intelligence, Nicosia*, May 27-29, North Cyprus.
- **(2003):** Fuzzy Error Matrix For Medical Prognosis, *WILF 2003 –International Workshop on Fuzzy Logic and Application*, 9-11, October, Palazzo Serra di Cassano, Via Monte di Dio 14, Napoli, Italy.
- **(2002):** Fuzzy control method to find a precise temperature set point for distillation of crude oil in a refinery, *IIT Kharapur*, paper has been selected to be published in the Proceedings, and Paper has presented in the *International Conference on Analysis and Discrete Structures*, 22-24, Indian Institute of Technology, Kharapur (Narosa Publication).
- **(2001):** Application of Fuzzy Theory to Reduce the Waste Gas Flow in Oil Refinery, *88th Session of the Indian Science Congress*, 3-7, January, New Delhi. This paper won the best poster presentation award in the Science Congress and a cash prize of Rs.1000/-.
- **(2001):** Fuzzy Linear Programming Model for the production schedule of chemical plants, *National conference on The Role of Mathematics in New Millennium Theories and Application*, Department of Mathematics, Jadavpur University, 23 – 25, March, Calcutta.
- **(2001):** Operability Study of Decision Tables in a Chemical Plant Using Hierarchical Genetic Fuzzy Control Algorithms”, *International Conference on Industrial Mathematics*, 12-14, Indian Institute of Technology, Madras.
- **(2000):** Use of Fuzzy Optimization Techniques in the Chemical Plant Industries, *National Conference on Optimization Techniques in Industrial Mathematics*, 1-3, March, University of Madras, Chennai.
- **(2000):** Application of Fuzzy Theory to Study the Production Demand Aspects in Chemical Plants, *15th Annual Conference of the Ramanujan Mathematical Society*, 5-7, June, University of Madras, Chennai.
- **(2000):** Fuzzy Control to Crude Refinery, *National Conference on Indian Mathematical Society*, 19-22, December, University of Pune, Pune.
- **(2000):** Development of long-range planning for a chemical plant using fuzzy programming, *One day symposium on Mathematical Methods and Applications*, Department of Mathematics, Indian Institute of Technology Madras, 22, December, Chennai, India.
- **(1999):** Determination of Existence of Polymers with given Melting Points Using Fuzzy Theory, *86th Session of the Indian Science Congress*, 3-7, January Anna University, Chennai.
- **(1999):** Fuzzy approach to the structural flexibility for heat integrated distillation columns, *Sixth Ramanujan Symposium On Algebra and its Applications*, The Ramanujan Institute For Advanced Study in Mathematics, 24 - 26, February, University of Madras, Chennai.

- **(1999):** Group Matrices, *National Conference, Indian Mathematical Society*, 19-22, December, University of Pune, Pune.
- **(1999):** Maximize the Net Present Value of Chemical Plant by Using Fuzzy Set Theory, *National Conference on Mathematical Methods and Applications*, Department of Mathematics, Indian Institute of Technology Madras, 22, December, Chennai.
- **(1998):** Fuzzy Approach to the Dynamic Optimization Problem in Chemical Engineering, *5th International Symposium on Optimization and Statistics*, Aligarh Muslim University, 8 - 10, December, Aligarh.
- **(1998):** *Estimation of unknown flow rates in n -flow rates of a chemical plant*, *National Conference on Mathematical Methods and Applications*, Department of Mathematics, Indian Institute of Technology, Madras, 22, December, Chennai.

Research Project

- Major Research Project - Sanctioned by UGC India.
Principal Investigator: Dr. S R Kannan
Title of project: Fuzzy Clustering Techniques in Segmentation of Breast Magnetic Resonance Images.
Duration: April 2007 – March 2010 (3 Years)
Amount: Rs. 5, 62,100/-
Ref: F. No. 32-171/2006(SR)
<http://www.ugc.ac.in/financialsupport/midtermlists/science06/mathsmidterm.pdf>