

## Curriculum Vitae of Dr. R. UTHAYAKUMAR



1. Present Position : **Reader in Mathematics**  
Department of Mathematics  
Gandhigram Rural Institute –  
Deemed University  
Gandhigram. 624 302
2. Educational Qualifications : M.Sc., M.Phil., B.Ed., PGDCA., Ph.D.
3. Teaching and Research Experience :  

Teaching Experience	: 18 Years
Research Experience	: 14 Years
4. Research Guidance  

<b>Number of Ph.D Candidates Guiding</b>	: 6
<b>Ph.D Awarded</b>	: 1

### M. Phil Dissertations guided

1. Solution of system of Linear equations and non linear unconstrained optimization problem – A neural network approach using MATLAB - 2006.
2. Analysis of Cantor Set – 2006.
3. Mandelbrot set- Dimension Analysis – 2006.
4. Image processing and fractal dimension with implementation procedure - 2006.
5. Solving the system of linear and non-linear equations using Hopfield networks - 2006.
6. Fuzzy time series model of negative and multiplicative fuzzy numbers - 2006.
7. Fractals and Markov chains via Domain Theory - 2006.
8. Algorithm for solving individual and serial supply chain Multi-Criteria inventory problem (Neural Network) - 2006.
9. Detection and Localization of Skin Cancer - 2006.
10. Increased in Rapid Eye Movement Sleep - 2006.
11. Rough Sets and Impreciseness in Information Classification –LPP Application - 2006.
12. Neural Network Representation of Fuzzy Linear Programming Problem 2007.
13. Countable Iterated Function Systems and Fractal Gray Code - 2007.

14. The Hausdorff measures of some fractals - 2007.
15. Distances and Connectedness in Topological Self-similar sets - 2007.
16. Fractals in medicine - 2007.
17. Fractal Measure, dimension and its applications - 2008.
18. Fractals and Harmonic Measures - 2008.
19. Fractals in Nature – 2009.
20. Uniform Fractals and Applications of Generalized Fractal Dimensions in Electroencephalogram – 2009.
21. Fractal Analysis of Body Cells and Signals – 2009.
22. Fractal Dimension and its Applications – 2009.
23. A Study on Fractal Dimension with Fractal Interpolation Function – 2009.
24. The connected and auto-correlated domination number of a graph – 2008.
25. Double split domination in a graph – 2008.
26. On that graph that equal domination number & connected domination number – 2008.
27. A note on domination block graph domination non-split domination – 2008.
28. Edge sum number and edge reconstruction problems – 2008.
29. Vertex fusion and directed split stars in domination – 2009.
30. Laplacian spectrum and domination number of a graph – 2009.
31. On the total domination critical graphs – 2009.
32. Flow critical and limited packing in graphs – 2009.

## 5. Research Projects

### **UGC – SAP**

Deputy Coordinator of UGC-SAP (DRS) Project, Department of Mathematics, Gandhigram Rural Institute – Deemed University, Gandhigram.

Title	: Optimization Theory and Mathematical Modeling
Project No.	: F.510/6/DRS/2004 (SAP-I)
Funding Agency	: University Grants Commission, New Delhi.
Period	: 1st April 2004 to 31st March 2009 (5 Years)
Amount	: Rs.26 lakhs

### **UGC - Major Research Project**

Title of the Project	: Estimating the chaotic dynamics in the Human Brain via Fractal Dimensions
Project Sanctioned No.	: F. No. 33-114/2007 (SR)

Funding Agency : University Grants Commission (UGC),  
New Delhi – 110 002.  
Period of the Project : 01.04.2008 to 31.03.2011.  
Total Amount : Rs. 7, 26, 800.00 /-

6. List of Publications

**International Refereed Journals (Science Citation Indexed)**

1. R. Uthayakumar and P. Paramanathan, **Fractal Dimension of irregular Digitalized Curves by divider method**, Applied Mathematics and Computation, 2007, 189(1), 68-71.
2. R. Uthayakumar and P. Paramanathan, **An algorithm for computing Fractal Dimension of Rectifiable Irregular graphs**, Applied Mathematics and Computation, 2007, 190(1), 305-308.
3. P. Paramanathan and R. Uthayakumar, **An algorithm for Computing the Fractal Dimension of Waveforms**, Applied Mathematics and Computation, 2008, 195(2), 598-603.
4. A. Thangam and R. Uthayakumar, **A two-level supply chain with partial backordering and approximated Poisson demand**, European Journal of Operational Research, 2008, 187, 228 – 242.
5. A. Thangam and R. Uthayakumar, **Evaluation of Supply Chain Structures using a Delayed Product Differentiation Process**, International Journal on Advanced Manufacturing and Technology, 2008, 39, 401-408.
6. A. Thangam and R. Uthayakumar, **A two-level distribution inventory system with stochastic lead time at the lower echelon**, International Journal on Advanced Manufacturing and Technology, Article in the Press.
7. P. Paramanathan and R. Uthayakumar, **Size Measure Relationship method for fractal analysis of signals**, *Fractals*, 2008, 16(3), 235-241.
8. P. Paramanathan and R. Uthayakumar, **Application of fractal theory in analysis of Human electroencephalogram signals**, Computers in Biology and Medicine, 2008, 38(3), 372-378.
9. R. Uthayakumar and P. Parvathi, **A continuous review inventory model with controllable backorder rate and investments**, International Journal of Systems Science, 2008, 1, 1-10.
10. R. Uthayakumar and P. Parvathi, **Inventory Models with mixture of Backorders involving Reducible Lead Time and Setup Cost**, OPSEARCH, 2008, 45(1), 12-33.
11. R. Uthayakumar and K.V. Geetha, **Replenishment Policy for Single Item Inventory Model with Money Inflation**, OPSEARCH, 2009, 46(3), 345-357.

12. G. Jayalalitha, V. Shanthoshini Deviha, R. Uthayakumar, **Fractal model for blood flow in cardiovascular system**, Computers in Biology and Medicine, 2008, 38(6), 684-693.
13. G. Jayalalitha and R. Uthayakumar, **Border detection of skin cancer cells with fractal dimension**, Fractals, 2009, 17(2), 171-180.
14. A. Thangam and R. Uthayakumar, **Two-echelon trade credit financing for perishable items in a supply chain when demand depends on both selling price and credit period**, Computers and Industrial Engineering, 57, 773-786.
15. A. Thangam and R. Uthayakumar, **Optimal pricing and lot-sizing policy for a two-warehouse supply chain system with perishable items under partial trade credit financing**, Operational Research, Article in the Press.
16. K. Annadurai and R. Uthayakumar, **Controlling setup cost in (Q, r, L) inventory model with defective items**, Applied Mathematical Modeling, Article in the Press.
17. K.V. Geetha and R. Uthayakumar, **Economic design of an inventory policy for non-instantaneous deteriorating items under permissible delay in payments**, Journal of Computational and Applied Mathematics, Accepted for publication.

### International Journals

1. A. Thangam and R. Uthayakumar, **A continuous review two-echelon supply chain with stochastic lead times**, Tamsui Oxford Journal of Management Sciences, 2007, 23, 01-18.
2. A. Thangam and R. Uthayakumar, **Analysis of Partial Trade Credit Financing in a Supply chain by EPQ-based models**, Advanced Modeling and Optimization, 2008, 10, 177-198.
3. R. Uthayakumar and K.V. Geetha, **A Replenishment Policy for Non-instantaneous Deteriorating Inventory System with Partial Backlogging**, Tamsui Oxford Journal of Mathematical Sciences, 2009, 25(3), 313-332.
4. M. Valliathal and R. Uthayakumar, **A Deterministic Two-Warehouse Inventory Model For Deteriorating Items With Stock-Level-Dependent Demand Rate**, ASOR Bulletin, 2009, 28, 10-24.
5. M. Valliathal and R. Uthayakumar, **The production - inventory problem for ameliorating /deteriorating items with non- linear shortage cost under inflation and time discounting**, Applied Mathematical Sciences, 2010, 6, 289-304.
6. M. Valliathal and R. Uthayakumar, **An EOQ model for perishable items under stock and Time-dependent selling rate with shortages**, Journal of Engineering and Applied Sciences, 2009, Article in the Press.

7. M. Valliathal and R. Uthayakumar, **Effects of inflation and time discounting on an EOQ model for perishable items under time-dependent selling rate and time-dependent partial backlogging**, International Journal of Applied Mathematical Analysis and Applications, 2009, Article in the Press.
8. M. Valliathal and R. Uthayakumar, **A finite horizon deterministic economic production quantity models for deteriorating items with inventory level dependent demand rate and shortages**, Indian Journal of Mathematics and Mathematical Science, 2009, Article in the Press.
9. M. Valliathal and R. Uthayakumar, **A finite horizon EOQ models with time-varying demand and partial backlogging under deterioration and stock-dependent demand**, International Journal of Mathematical Sciences, 2009, Article in the Press.
10. R. Uthayakumar and P. Parvathi, **Determination of Replenishment Cycle Time for an EOQ Model with Shortages and Deteriorating Items**, International Journal of Mathematical Sciences, 2007, 6(3-4), 289-303.
11. R. Uthayakumar and K. Annadurai, **Controllable Lead Time and Lost Sales Rate Reduction with Varying order cost in Stochastic inventory system**, International Journal of Applied Mathematical Analysis and Applications, 2007, 2(1-2), 71-81.
12. R. Uthayakumar and P. Parvathi, **A Deterministic Inventory Model for Deteriorating Items with Time Dependent Demand, Backlogged partially when Delay in Payments is Permissible**, International Journal of Mathematical Sciences, 2006, 5(2), 201-219.
13. R. Uthayakumar and P. Parvathi, **A Deterministic Inventory Model for Deteriorating Items with Partially Backlogged and Stock and Time Dependent Demand Under Trade Credit**, International Journal of Soft Computing, 2006, 1(3), 199-206.
14. P. Kanniappan and R. Uthayakumar, **SP Hadamard well-posedness for convex programs**, Journal of Pure and Applied Mathematika Sciences, LXI, No.1-2, 2005.

### **International Conferences**

1. R. Uthayakumar and P. Paramanathan, **Detection of Critical Brain Sites using Fractal Analysis**, Proceedings of 14th International Conference on Advanced Computing and Communication 2006, IEEE, 560-563.
2. G. Jayalalitha and R. Uthayakumar, **Estimating the Skin cancer using Fractals**, Proceeding of the International Conference on Computational Intelligence and Multimedia Applications, IEEE, 2007, 307-312.

3. P.Paramanathan and R.Uthayakumar, **Detecting Patterns in Irregular Time Series with Fractal Dimension**, Proceedings of the International Conference on Computational Intelligence and Multimedia Applications, 2007, IEEE, 323-327.
4. G. Jayalalitha, V. Shanthoshini Deviha and R.Uthayakumar, **Fractal model of the blood vessel in cardiovascular system**, Fifteenth International Conference on ADCOM 2007, IEEE Computer Society, 175-182.
5. G. Jayalalitha and R.Uthayakumar, **Signature recognition by fractals**, Proceedings of the International Conference on Mathematical Methods and Computation – ICOMAC 2009, 613-321.

### National Conferences

1. P. Kanniappan and R. Uthayakumar, **Convergence of B-Vex Optimization Problems**, Proceedings of the XII Ramanujan Symposium on Recent Trends in Analysis, 78-87, 2005.
2. R. Uthayakumar, **Mathematical modeling of the blood flow in Cardio Vascular System**, Proceedings of the National Conference on Recent Trends in Computational Mathematics, 2005, 158-165.
3. R. Uthayakumar and P. Parvathi, **Trade Credit Policy and Replenishment Cycle Time of an EOQ Model**, Proceedings of the National Conference on Intelligent Optimization Modeling, Allied Publishers, 254-266, 2006.
4. R. Uthayakumar and P. Parvathi, **A continuous Review Inventory Model with Controllable Setup Cost, Lead time and with Unknown Demand Distribution**, Proceedings of National Conference on Management Science and Practice, 2006, 87-106.
5. R. Uthayakumar, **Economic order quantity for deteriorating items with time discounting**, Proceedings of the Conference on Theory and Practice of Operational Research in Information Technology & Supply Chain Management, 2007, 125-136.
6. R. Uthayakumar and A. Thangam, **A two-level supply chain with a mixed continuous periodic review replenishment policies**, Proceedings of the Conference on Theory and Practice of Operational Research in Information Technology & Supply Chain Management, 2007, 15-20.
7. R. Uthayakumar and K.V. Geetha, **Ordering Policy for Non-instantaneous deteriorating items with partial backlogging**, Proceedings of the Conference on Theory and Practice of Operational Research in Information Technology & Supply Chain Management, 2007, 99-108.

8. K. Annadurai and R. Uthayakumar, **Mixture inventory model involving controllable setup cost and lost sales with defective items**, Proceedings of the Conference on Theory and Practice of Operational Research in Information Technology & Supply Chain Management, 2007, 91-98.
9. R. Uthayakumar and K. Annadurai, **Optimal investment strategy to control lead time and lost sales rate reduction with varying order cost in periodic inventory model**, Proceedings of National Conference on Mathematics, Computing and Modeling, 2007, 226-234.
10. K. Annadurai and R. Uthayakumar, **Probabilistic inventory model involving variable ordering cost with service level constraint**, Proceedings of the Fourth National Conference on Mathematical and Computational Models, 2007, 141-148.
11. K. Annadurai and R. Uthayakumar, **Setup cost reduction in distribution free inventory model with defective items**, Proceedings of the National Conference on Applied Mathematics, 2008, 81-86.
12. R. Uthayakumar and P. Parvathi, **Two echelon system for differential items under single management with shortages under inflation**, Proceedings of the Conference on Theory and Practice of Operational Research in Information Technology & Supply Chain Management, 2007, 109-120.
13. R. Uthayakumar and P. Parvathi, **Inventory model with pricing tactics for demand in auto-correlated products**, Proceedings of National Conference on Mathematics, Computing and Modeling, 2007, 247-254.
14. K. V. Geetha and R. Uthayakumar, **An EOQ model for non-instantaneous deteriorating items with stock dependent consumption rate under inflation and time discounting**, Proceedings of National Conference on Mathematics, Computing and Modeling, 2007, 201-210.
15. K. V. Geetha and R. Uthayakumar, **Analysis of Inventory Systems with Stock-Dependent Demand under Inflation**, Proceedings of the Fourth National Conference on Mathematical and Computational Models, 2007, 75-86.

**Books Edited:**

1. Dr. P.Balasbramian and Dr. R. Uthayakumar **“Intelligent Optimization Modeling”-Allied Publishers, Chennai, 2006.**
2. Dr. P.Balasbramian and Dr. R. Uthayakumar **“Mathematics, Computing and Modeling” – Allied Publishers, Chennai, 2007.**

7. Short Term Courses / Symposium/  
Conferences attended :

**Courses Attended**

1. Attended a course on “Study Skills” at GTN Arts College, Dindigul during March 3, 1986.
2. Attended a UGC Sponsored Refresher Course on “Applicable Mathematics” for 21 days held at Gandhigram Rural Institute - Deemed University, Gandhigram during November 5-25, 2003.
3. Attended a UGC Sponsored Refresher Course on “Applicable Mathematics” for 21 days held at Gandhigram Rural Institute - Deemed University, Gandhigram during November 15-December 5, 2004.

8. Short Term Courses / Symposium/  
Conferences Organized

**Conference Organized:**

1. Organized a UGC-SAP (DRS) National Conference on Intelligent Optimization Modeling (NCIOM - 2006) held at Department of Mathematics, Gandhigram Rural University, Gandhigram from 03.03.2006 to 04.03.2006.
2. Co-convener of UGC-SAP (DRS) National Conference on Mathematics, Computing and Modeling (NCMCM 2007) held at Department of Mathematics, Gandhigram Rural University, Gandhigram from 03.03.2007 to 04.03.2007.

9. Membership in Scientific Bodies /  
Association :

**Membership in Professional Bodies:**

1. Life Member in Ramanujan Mathematical Society.
2. Member of the academic council, Gandhigram Rural University, Gandhigram.

**Member of Board of Studies:**

1. Gandhigram Rural University, Gandhigram.
2. Mother Teresa Women's University, Kodaikanal.

**Member of Board of Examiners:**

1. Gandhigram Rural University, Gandhigram.
2. Madurai Kamaraj University, Madurai.
3. Manonmaniam Sundaranar University, Tirunelveli.
4. Baharathidhasan University, Trichirappalli.
5. Madras University, Chennai.

10. Resource Person  
(Inaugural address / Guest  
Lecture / Chairman) :

**Chaired Sessions on Conference:**

1. Chaired the Technical Session on an "UGC Sponsored National Conference on Recent Trends in Computational Mathematics" organized by Department of Mathematics, Gandhigram Rural University, Gandhigram from 18.03.2004 to 19.03.2004.
2. Chaired the Technical Session on an "UGC-SAP (DRS) National Conference on Intelligent Optimization Modeling (NCIOM – 2006)" organized by Department of Mathematics, Gandhigram Rural University, Gandhigram from 03.03.2006 to 04.03.2006.
3. Chaired the Technical Session on an "UGC-SAP (DRS) National Conference on Mathematics, Computing and Modeling (NCMCM – 2007)" organized by Department of Mathematics, Gandhigram Rural University, Gandhigram from 03.03.2007 to 04.03.2007.
4. Chaired the Technical Session on an "International Conference on Operations Research Applications in Engineering and Management (ICOREM)" organized by Department of Management Studies, Anna University, Tiruchirappalli from 27.05.2009 to 29.05.2009.

**Invited Lectures:**

1. Delivered a lecture on "Mathematics in Real Life" to the B.Ed students of Lakshmi College of Education, Gandhigram under the auspices of Mathematics Association Inauguration in February 2002.

2. Delivered a lecture on "Queueing theory" to the M.B.A students of Theni Nadar Saraswathi College of Science and Arts, Theni.
3. Delivered a lecture on "Analytical thinking" to the B.Sc Mathematics students under the auspices of Mathematics Association Inauguration -The Inaugural address at Sri kaliswari College, Viruthunagar.
4. Delivered a lecture on "Applications of Mathematics in Engineering" to the Engineering students under the auspices of Mathematics club Inauguration - The Inaugural address at PSNA College of Engineering and Technology, Dindigul.
5. Delivered a lecture on "Ramanujan and Number Theory" to the B.Ed students of Lakshmi College of Education, Gandhigram under the auspices of Mathematics Association Inauguration and Ramanujan Birthday celebration on 22nd December 2004.
6. Delivered a Lecture on "Fuzzy Logic and its Applications" to the students of M.sc., Mathematics at Jeyaraj Annapackiam College for Women, Periyakulam.
7. Delivered a Lecture on " Diophantine equations and its Applications" to the students of Mathenatics at Jeyaraj Annapackiam College for Women, Periyakulam.
8. Delivered a Lecture on "Mathematical Logic and its Applications to the Computer Science" to the students of Computer Science at Parvathi's College of Arts and Science, Dindigul on 21.12.2005.
9. Delivered a Lecture on "Number Theory and Cryptography" to the students of Mathematics at Cardamom Planters' Association College, Bodinayakanur on 01.04.2006.
10. Delivered a Lecture on "Statistics and its Applications" to the school children of Vacation Training Programme on Bioresources at Thiagarajar College, Madurai on 26.05.2006.
11. Delivered a Lecture on "Applications of Mathematics in IT Industry" in the National Seminar organized by Department of Mathematics, Arulanandar College, Karumathur on 20.02.2007.
12. Delivered a Lecture on "Effective Teaching of Mathematics" at Parvathi's college of Science and Arts, Dindigul on 04.08.2007.(Faculty Orientation Programme).
13. Delivered a Lecture on "Optimization Techniques and Mathematical Modeling" at R.V.S College of Engineering, Dindigul on 16.06.2008.
14. Delivered a Lecture on "Fractal Theory", UGC – sponsored refresher course on Mathematics at Department of Mathematics, Bharathidasan University, Tiruchirappalli on 24.11.2008.
15. Delivered a Lecture on "Optimization Techniques in the Real Life Applications" at Department of Mathematics, G.V.G College for Women, Udumalpet on 12.12.2008.

16. Delivered a Lecture on “Mathematics Education – Content Enrichment Training” to the School Teachers of 6th, 7th and 8th Standard, at Nehruji Memorial Higher Secondary School, Dindigul on 09.02.2009.
17. Delivered a Lecture on “Fractal Analysis” in connection with Mathematics Association Function, Department of Mathematics, M.V.M Government Arts College for Women, Dindigul on 13.03.2009.
18. Delivered a Lecture on “Fractal Theory” at Department of Mathematics, Manonmaniam Sundaranar University, Tirunelveli on 19.03.2009.
19. Delivered a Lecture on “Fractal Geometry”, at Department of Mathematics, Bharathidasan University, Tiruchirappalli on 23.03.2009.
20. Delivered a Lecture on “Graph Theory and its Applications”, at Department of Mathematics, Arulmigu Palaniandavar Arts College for Women, Palani on 31.03.2009.

#### 11. Reviewer for Journals

1. Computers in Biology and Medicine (Elsevier)
2. Applied Soft Computing (Elsevier)
3. Applied Mathematical Modeling (Elsevier)
4. International Journal of Production Economics (Elsevier)
5. Opsearch (Springer)
6. International Journal of System Science (Taylor & Francis)

#### 12. Recognition

1. Received Best Paper Award for Young Mathematicians in the XIIth Annual Conference of the Ramanujan Mathematical Society held at Shimoga, Karnataka, during May 22-24, 1997.
2. Received Medal for the first rank in B.Sc., Mathematics.

#### 13. Fellowships Received :

Senior Research Fellow, NBHM & DAE Project entitled “**Study on Stability of Solutions and Convergence of Optimization Problems**”.

**Duration: 22.12.1994 to 19.12.1997 (3 years)**

#### 14. Administrative Experience

1. Worked as a Head-in-Charge of Mathematics Department for the period of ten months.