




## University Faculty Details Page on DU Web-site

Titl e	Prof.	First Name	Anu G.	Last Name	Aggarwal	Photograph
Designation	Professor					
Department	Operational Research					
Address (Campus)	Department of Operational Research, Faculty of Mathematical Sciences, University of Delhi					
(Residence)	D-132, Ashok Vihar, Ph-I, Delhi-110052					
Phone No (Campus)	011-27666672					
(Residence)optional						
Mobile	9810316072					
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Email	<a href="mailto:anuagg17@gmail.com">anuagg17@gmail.com</a> anuagg17@yahoo.com					
Web-Page						
<b>Education</b>						
Subject	Institution			Year		
Ph. D.	Department of Operational Research, University of Delhi			2007		
M.Phil.	Department of OR, D.U.			1999		
M.A.	Department of OR, D.U.			1996		
<b>Career Profile</b>						
Organization / Institution		Designation		Duration		
Department of OR, D.U.		Professor		2015-till date		
Department of OR, D.U.		Associate Professor		2012-2015		
Department of OR, D.U.		Assistant Professor		2008-2011		
KeshavMahavidyalaya, D.U.		Lecturer		2002 –2007		
Maharaja Agarsen College, D.U.		Lecturer		1997-2000		
<b>Research Interests / Specialization</b>						
Presently I am pursuing research in the field of Software Reliability, Marketing Management, Soft computing techniques.						
<b>Teaching Experience</b>						
Institution		Courses Taught				
Department of OR, D.U.		M.Sc. (O.R.)		Reliability and Maintenance Theory, Linear Programming, Queuing Theory, Software Reliability, Marketing		
		M.Phil. (O.R.)				

		Management
KeshavMahavidyalaya, D.U.	B.Sc. (Gen) Mathematical Science  B. Com. (H)	Optimization-I, Optimization-II, Queuing Theory & Reliability Theory.  Business Mathematics
Maharaja Agarsen College, D.U.	B.Sc. (Gen) Mathematical Science	Optimization-I, Optimization-II, Queuing Theory & Reliability Theory

### Research Publication List

#### In Indexed/ Peer Reviewed Journals

1. **Aggarwal Anu G.**, Nijhawan N. and Dhaka V. (2018). An SRGM for Multi-Release Open Source Software System, *International Journal of Innovation and Technology Management*, [Doi:10.1142/S0219877018500116](https://doi.org/10.1142/S0219877018500116)
2. Sameer Anand, VibhaVerma, and **Anu G. Aggarwal** (2018). Two Dimensional multi-release Software reliability modelling considering Fault reduction Factor under imperfect debugging. *Ingenieria Solidaria, Univ Cooperative Colombia*, Vol. 14.
3. **Anu G. Aggarwal**, C.K. Jaggi N.Nijhawan (2017), Optimal Release Policy for Multi-Release Software System, *International Journal of Operations Research and Information Systems*, Vol. 8(3), 21-38.
4. **Anu G Aggarwal**, V Dhaka, N.Nijhawan (2017) Reliability analysis for multi-release open-source software systems with change point and exponentiated Weibull fault reduction factor, *International Journal of Life Cycle Reliability and Safety Engineering*, Vol. 6(1), 3-14.
5. Tandon, A., **Aggarwal, Anu G.**, Nijhawan, N. (2016). An NHPP SRGM with Change Point and Multiple Releases. *International Journal of Information Systems in the Service Sector*, 8 (4), 57-68.
6. Kapur P.K.,**Aggarwal Anu. G**, Garmabaki A.H.S. (2015) Multi-generational innovation diffusion modeling: a two dimensional approach. *International Journal of Applied Management Sciences*, 7(1), 1-18.
7. Kapur P.K., **Aggarwal Anu G**, Garmabaki A.H.S, Tandon A. (2014) .The Impact of Bugs Reported From Operational Phase on Successive Software Releases *International Journal of Productivity and Quality Management*, 14(4), 423-440.

8. Kapur P. K., **Anu G. Aggarwal** & Nijhawan N.(2014), A Discrete SRGM for Multi-Release Software Systems, *International Journal of Industrial and Systems Engineering*, 16(2), 143-155, 2014.
9. Kapur P. K., **Anu G. Aggarwal** & Nijhawan N.(2014), A Unified Discrete Modeling Framework for Detection and Correction Processes of Multi-Release Software, *Mathematical Modeling and Applications*, Om Prakash (Ed.), 129-149.
10. Kapur P. K., **Anu G. Aggarwal**. & Garmabaki A.H.S , Singh G.(2013), Modeling diffusion of successive generations of technology (A general framework), *International Journal of Operational Research*, 16(4), 465-484.
11. Kapur P. K., Yamada S., **Anu G. Aggarwal**. & Srivastava A. K., “Optimal Price and Release time of a Software under Warranty”, *International Journal of Reliability, Quality and Safety Engineering*, 20(3),1340004-1, 2013.
12. P. K. Kapur, H. Pham, **Anu G. Aggarwal**, Gurjeet Kaur: “Two Dimensional Multi-Release Software Reliability Modeling and Optimal Release Planning”. *IEEE Transactions on Reliability* 61(3), pp. 758-768, 2012.
13. Amir.H.S.Garmabaki.,**Anu G. Aggarwal**, P.K.Kapur and V. S. S. Yadavali, "Modeling Two-Dimensional Software Multi-Upgradation and Related Release Problem (a Multi Attribute Utility Approach)," *International Journal of Reliability, Quality and Safety Engineering*, World Scientific Vol. 19, No. 3, 2012.
14. P.K.Kapur, **Anu G. Aggarwal** and Nidhi Nijhawan, “A Discrete SRGM for Multi-Release Software Systems”, Accepted for publication in *International Journal for Industrial and Systems Engineering*, Inderscience, 2012.
15. P.K.Kapur, **Anu G. Aggarwal**, Amir H.S.Garmabaki , “Modelling diffusion of successive generations of technology (A general framework) “ *International Journal of Operational Research (IJOR)*, Accepted 2012.
16. P.K.Kapur, **Anu G. Aggarwal**, Abhishek Tandon. “A Unified Approach for Developing Two Dimensional Software Reliability Model”, *International Journal of Operational Research*, Vol 13, No. 3, pp 318-337, 2012.
17. P.K. Kapur, Kuldeep Chaudhary, **Anu G. Aggarwal** and P.C. Jha “On The Development Of Innovation Diffusion Model Using Stochastic Differential Equation Incorporating Change In The Adoption Rate” *International Journal of Operational Research*, Vol.14, No. 4 , pp 472-484, 2012.
18. P.K. Kapur, **Anu G. Aggarwal** and Gurjeet Kaur, “Software Architecture based Reliability Estimation and related Optimal Effort Allocation”, *Communications in*

Dependability and Quality Management, an International Journal, Vol.13, No. 4, 2010, pp 5-18.

19. P.K. Kapur, **Anu G. Aggarwal** and Gurjeet Kaur, “Simultaneous Allocation of Testing Time and Resources for a Modular Software” International Journal of Systems Assurance Engineering and Management , Vol. 1, No. 4, Oct-Dec 2010, pp. 351-361.
20. P.K. Kapur, **Anu G. Aggarwal**, Gurjeet Kaur and Mashaallh Basirzadeh, “Optimizing adoption of a single product in multi-segmented market using innovation diffusion model with consumer balking”, International Journal. of Technology Marketing, 2010, Vol. 5, No.3 pp. 234 - 249.
21. P.K. Kapur, **Anu G. Aggarwal**, Omar Shatnawi, Ravi Kumar, “On the Development of Unified Scheme for Discrete Software Reliability Growth Modeling”, International Journal of Reliability, Quality and Safety Engineering, World Scientific, 2010, Vol. 17, No. 3, pp. 245-260.
22. P.K. Kapur, **Anu G. Aggarwal**, Ravi Kumar, “A unified approach for discrete software reliability growth model for faults of different severity using infinite server queuing model”, Communications in Dependability and Quality Management An International Journal, December 2010, vol-13, No. 4, pp. 66-81.
23. P.K.Kapur, **Anu G. Aggarwal**, Abhishek Tandon.“Two Dimensional Software Reliability Growth Model with Faults of Different Severity” Communications in Dependability and Quality Management An International Journal, September 2010, Volume 13, Number 3, pp. 86-97.
24. P. K. Kapur, **Anu G. Aggarwal**, Kanica Kapoor and Gurjeet Kaur, “Optimal Testing Resource Allocation for Modular Software Considering Cost, Testing Effort and Reliability using Genetic Algorithm”, International Journal of Reliability, Quality and Safety Engineering, 2009, Vol. 16, No. 6, pp. 495–508
25. P.K.Kapur, R.B.Garg, **Anu G. Aggarwal**, Abhishek Tandon. “General Framework for Change Point Problem in Software Reliability and Related Release Time Problem”. International Journal of Quality, Reliability and Safety Engineering, USA, 2009, Vol.16, No.6, pp 567-579.
26. P.K. Kapur, **Anu G. Aggarwal**, Samir Anand, “A New Insight into Software Reliability Growth Modeling” International Journal of Performability Engineering, Vol.5, No. 3 pp. 267-274, 2009.
27. P.K. Kapur, **Anu G. Aggarwal**, Jyotish Kumar, Ravi Kumar , “On Unification Schemes For Quantitative Software Quality Assessment”, Talk Paper for International

Conference On Dependability and Quality Management ICDQM 2009, Serbia.

28. P.K. Kapur, Omar Shatnawi, **Anu G. Aggarwal** and Ravi Kumar, “Unified Framework for Developing Testing Effort Dependent Software Reliability Growth Models”, WSEAS Transactions on Systems, pp. 521-531 Issue 4, Volume 8, 2009.
29. P.K.Kapur, V.S.S. Yadavalli, **Anu Gupta**, S.J. Classen “A Class of Flexible Software Reliability Growth Models” South African Journal of Industrial Engineering, Vol. 17(2), pp 109-125, 2006.
30. P.K.Kapur, Om Pal Singh, Omar Shatnawi, **Anu Gupta** “A Discrete NHPP Model For Software Reliability Growth With Imperfect Fault Debugging And Fault Generation” International Journal of Performability Engineering, Vol. 2, No. 4, pp 351-368, 2006.
31. P.K.Kapur, **Anu Gupta**, Omar Shatnawi, V.S.S. Yadavalli “Testing Effort Control Using Flexible Software Reliability Growth Model With Change Point” International Journal of Performability Engineering- Special issue on Dependability of Software/ Computing Systems, Vol. 2, No. 3, pp 245-262, 2006.
32. P.K.Kapur, V.S.S. Yadavalli, **Anu Gupta** “Software Reliability Growth Modelling Using Power Function Of Testing Time” International Journal of Operations and Quantitative Management, Vol.12, No.2, 2006.
33. P.K Kapur, **Anu Gupta**, Ompal Singh “On Discrete Software Reliability Growth Model & Categorization Of Faults” OPSEARCH, Vol. 42 No. 4 pp 340-354, 2005.

### **Conference Presentations**

1. **Anu G. Aggarwal**, V. Verma and S. Anand (2017). Architecture based software reliability allocation under uncertain preferences, Proceedings of the First International Conference on Information Technology and Knowledge Management. Annals of Computer Science and Information Systems, Vol. 14, pages 3-12.
2. **Anu G. Aggarwal**, Sharma H. and Abhishek Tandon, (2017), An Intuitionistic Approach for Ranking OTA website under Multi-Criteria Group Decision Making Framework, Proceedings of the First International Conference on Information Technology and Knowledge Management. Annals of Computer Science and Information Systems, Vol. 14, pages 21-27.
3. **Anu G. Aggarwal** and Aakash. (2017), An Innovative B2C E-commerce Website selection using the ME-OWA and Fuzzy AHP. Proceedings of the first international conference on Information Technology and Knowledge Management. Annals of

4. Diwakar, & **Aggarwal, Anu G.** (2017). Multi Release Reliability Growth Modelling for Open Source Software Under Imperfect Debugging. Presented at Joint International Conference on Interdisciplinary Research and 8th International Conference on Quality, Reliability, Infocom Technology and Business Operations (JIRICQRIT) held at Amity University, Noida, 2017.
5. **Anu G. Aggarwal**, Nijhawan, N., & Tandon, A. (2015). A Change Point Based Discrete SRGM for A Multi-Release Software System Proceedings of 1st International Conference on Evidence Based Management, BITS Pilani (Vol. II, pp. 674-678). Delhi: Excellent Publishing House. doi: 978-93-84935-18-4.
6. Amir.H.S.Garmabaki, **Anu.GAggarwal** ,P.K.Kapur , “Multi up- gradation software reliability growth model with faults of different severity,” Published in the proceedings of The IEEE International Conference on Industrial Engineering and Engineering Management (IEEM),Singapore, 6-9 Dec.2011, pp.1539-1543.
7. P.K.Kapur, **Anu G. Aggarwal**, Abhishek Tandon “Innovation Diffusion Model For Successive Generation Merchandise Considering The Effect Of Consumer Balking”, published in the proceedings of International Congress on Productivity, Quality, Reliability, Optimization and Modeling, 2011, Vol.1:Theoretical Papers, pp 150-159.
8. **Anu G. Aggarwal**, P.K. Kapur , Gurjeet Kaur, “Testing Time and Resource Dependent Two Dimensional Software Reliability Model for Faults of Different Severity and Related Optimal Allocation Problem”, published in the proceedings of International Congress on Productivity, Quality, Reliability, Optimization and Modeling, 2011, Vol.1:Theoretical Papers, pp 160-175.
9. **Anu G. Aggarwal**, Gurjeet Kaur and P.K. Kapur, “Optimal Testing Resource Allocation for Modular Software Considering Imperfect Debugging and Change Point using Genetic Algorithm”, published in the proceedings of 2nd International Conference on Reliability, Safety and Hazard, 2010, December 14-16, 2010, pp-535-541 by IEEE.
10. **Anu G. Aggarwal**, Gurjeet Kaur and P.K. Kapur, “The Effect of Change Point in Resource Allocation Problem for a Modular Software”, published in the proceedings of International Conference on Reliability, Infocom Technology and Optimization, 2010, pp-134-150.
11. P.K.Kapur, A.S.Garmabaki, **Anu.G Aggarwal**,” Generalized framework for fault detection and correction processes for successive release of software,” published in the proceedings of Fourth International Conference on Quality, Reliability and Infocom Technology (ICQRIT 2009), 18 to 20 December 2009, Delhi University, pp. 252-263.
12. P.K.Kapur, **Anu G. Aggarwal**, Gurjeet Kaur and Avneesh Chauhan, “Testing Time Allocation Problem for N-Version Modular Software System”, published in the proceedings of Fourth International Conference on Quality, Reliability and Infocom Technology (ICQRIT 2009), 18 to 20 December 2009, , Delhi University, pp.11-24.

13. P.K. Kapur, Sameer Anand, **Anu G. Aggarwal**, “Release Time Problem with Change Point Incorporating the effect of Imperfect Debugging and Fault Generation”, published in the proceedings of Fourth International Conference on Quality, Reliability and Infocom Technology (ICQRIT 2009), 18 to 20 December 2009, pp. 244-251.
14. P.K.Kapur, Rubina Mittal, **Anu Gupta** “A General Software Reliability Growth Model with Power Logistic Function for Testing and Operational Use (An Application of Innovation and Diffusion Model in Marketing)” presented at ICORAID-ORSI Conference held in December, 2005.
15. P.K.Kapur, Rubina Mittal, **Anu Gupta**, MashaallaBasirzadeh “Modelling Software Reliability Growth in Operational Phase (An Application of Innovation and Diffusion Model in Marketing)” Reliability, Safety and Hazard (Advances in Risk-Informed Technology), Eds.: PV Varde, A Srividya, VVS Sanyasi Rao and Ashok Chauhan, Narosa Publications Pt. Ltd., 2005.
16. P.K.Kapur, Ompal Singh, **Anu Gupta** “Software Reliability Growth Model with Number of Instructions Executed Dependent on Testing Effort” Reliability, Safety and Hazard (Advances in Risk-Informed Technology), Eds.: PV Varde, A Srividya, VVS Sanyasi Rao and Ashok Chauhan, Narosa Publications Pt. Ltd., 2005.
17. P.K Kapur, Archana Kumar, Rubina Mittal, **Anu Gupta**. “Flexible Software Reliability Growth Model Defining Errors of Different Severity”, Reliability, Safety and Hazard (Advances in Risk-Informed Technology), Eds.: PV Varde, A Srividya, VVS Sanyasi Rao and Ashok Chauhan, Narosa Publications Pt. Ltd., 2005.
18. P.K Kapur, Amit Gupta, **Anu Gupta**, Archana Kumar. “Discrete Software Reliability Growth Modelling”, Quality, Reliability and IT (Trends & future Directions), Eds.: P.K. Kapur and A.K Verma, Narosa Publications Pvt. Ltd., 2005.

#### **Papers Published in National Conference Proceedings**

19. P.K.Kapur, A.H.S.Garmabaki, **Anu G. Aggarwal**, “Imperfect Debugging Software Reliability Growth Model For Multiple Releases”, Published in the proceedings of 5th National Conference On Computing In Nation Development, BVICAM, 10-11 March 2011 at New Delhi, pp. 337-344.
20. P.K.Kapur, **AnuG.Aggarwal**, Abhishek Tandon., “Two Dimensional Flexible Software Reliability Growth Model with Two Types of Imperfect Debugging”. Published in the proceedings 5th National Conference on Computing for Nation Development BVICAM, 10-11 March 2011 at New Delhi, pp. 345-350.
21. P.K.Kapur, **Anu G. Aggarwal**, Gurjeet Kaur , “Measuring Concurrent Effect of Time and Testing Coverage using Software Reliability Growth Model with Change Point”, In Proceedings of the 5th National Conference; INDIACom-2011, Computing For Nation Development, March 10-11, 2011, pp. 613-618.

22. **Anu G. Aggarwal**, P.K.Kapur, Gurjeet Kaur and Ravi Kumar, “Genetic Algorithm Based Optimal Testing Effort Allocation Problem For Modular Software”, in Proceedings of the 4th National Conference; INDIACom-2010, Computing For Nation Development, February 25 – 26, 2010, pp. 527-536.

23. **Anu G. Aggarwal**, Ravi Kumar and P.K.Kapur, “A New Approach For Developing Testing Effort Dependent Software Reliability Growth Models”, 3rd National Conference on Computing For Nation Development, INDIACoM-2009, BharatiVidyapith’s Institute of Computer Applications and Management. New Delhi, pp. 425-432, February 2009.

24. Ompal Singh, **Anu Gupta**, P.K.Kapur “A Flexible Software Reliability Growth Model with Two Types of Imperfect Debugging”, published in the Proceedings of the Conference on Contributions of Mathematics in Technological Development, Institute of Technology and Management, Gurgoan, May 2006.

### **Professional Societies Memberships**

Life Member of Society for Reliability Engineering, Quality and Operations Management

### **Ph.D./M.Phil. Supervision**

#### ➤ **Ph.D. Supervision**

1. Modeling of Testing Resource allocation and Multi-Releases in Software Reliability: Gurjeet Kaur (2011)
2. A Novel Approach for Modeling Software Reliability and successive generations of Technologies: Abhishek Tandon (2012)
3. Quantitative Approach to Human Resource Management: Dinesh Kumar Khurana (2013)
4. Some Contributions to Multi-Release Problems in Software Reliability and Successive Generations of Technologies: Amir H.S. Garmabaki (2013)
5. Some Contributions to Discrete Modeling of Multi-Releases in Software Reliability: Nidhi Nijhawan (2017)

#### ➤ **M.Phil. Supervision**

1. Testing Effort Based Software Reliability Growth Modeling And Some Related Optimization Problems: Gurjeet Kaur



2. Testing Coverage Based Software Reliability Growth Models: Hemant Kumar
3. Applications Of Genetic Algorithms In Software Reliability: Kanica Kapoor
4. Software Architecture Based Reliability Models: Meenakshi
5. A Study on Unification Schemes in Software Reliability: Avinash Kumar Srivastava
6. A Study on Generalized Software Reliability Growth Models : Tripti Verma
7. A Study on Reliability Models for Embedded systems: Manprit Gill
8. A Study on Reliability Growth Models for Open Source Software systems : Pooja Sachdeva
9. Bayesian Software Reliability Growth Models : Shweta Chauhan
10. A Study on Marketing Models in E-Commerce: Himanshu Sharma
11. A study on Online Media Selection Models: Aakash
12. Some Applications of Soft Computing Techniques in Software Reliability: Meena
13. A Study on Pricing Problems in Airlines Industry: Neha
14. A Study on Effects of Free Sampling on Diffusion of Innovation: RachnaSain
15. A Study on Warranty Models in Marketing: VibhaVerma
16. A Study on Reliability Growth Models for Multi Release Open Source Software Systems: Diwakar

➤ **Candidates Currently Registered Under Ph.D.**

S. No.	Name	Date of Registration	Area of Research
1	Aakash	April 2017	Marketing Management
2	Himanshu Sharma	September 2017	Marketing Management
3	VibhaVerma	September 2017	Software Reliability
4	Rajat Arora	October 2017	Software Reliability

➤ **Candidates Currently Registered Under M.Phil.**

<b>S. No.</b>	<b>Name</b>	<b>Registration</b>	<b>Research Area</b>
1	Amit Choudhry	September 2016	Software Reliability
2	Sanchita Aggarwal	September 2017	Marketing Management

**PARTICIPATION IN CONFERENCE & SEMINARS**

- Participated and Chaired one session in International Conference on Evidence based Management held in BITS, Pilani, during March 20-21, 2015.
- Participated and Chaired one session in International Conference on Quality, Reliability, Infocom Technology and Industrial Technology Management held in University of Delhi, New Delhi during November 26-28, 2012.
- Participated and presented research papers in 5<sup>th</sup> National Conference on Computing in Nation Development, BVICAM, held during 10-12 March 2011 at New Delhi.
- Participated and presented research papers in International Congress on Productivity, Quality, Reliability, Optimization and Modeling, ISI, held during 7-8 February 2011 at India Habitat Centre, New Delhi.
- Participated and Chaired one session in International Conference on Reliability, Infocom Technology and Optimization, held during 1-3, November 2010 at Lingaya's University, Nachauli, Faridabad, India

- Participated and presented research papers in 4<sup>th</sup> National Conference on Computing For Nation Development, BVICAM held during 25 – 26 February, 2010 at New Delhi.
- Worked as Conference Joint-Secretary, International Conference on Quality, Reliability and Infocom Technology (Trends and Future Directions) held in University of Delhi, New Delhi during December 18-20, 2009.
- I have been awarded Young Researcher Award for Applications of Soft Computing Techniques in Software Reliability awarded at 4<sup>th</sup> International Conference on Quality, Reliability and Infocom Technology (Trends and Future Directions) held in University of Delhi, New Delhi during December 18-20, 2009.
- Participated and presented one research papers in National Conference on Computing For Nation Development, INDIACoM-2009, Bharati Vidyapith's Institute of Computer Applications and Management. New Delhi, February 2009.
- Worked as Conference Joint-Secretary, International Conference on Quality, Reliability and Infocom Technology (Trends and Future Directions) held in INSA, New Delhi during December 02-04, 2006.
- Participated and presented two research papers in International Conference on Reliability, Safety and Hazard, 2005 (ICRESH-05) held in Mumbai during December 01-03, 2005
- Participated and presented one research paper in International Conference on Operations Research Applications to Infrastructure Development (ICORAID-2005-ORSI), Bangalore, India, December 27-29, 2005.

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**RESEARCH PROJECTS UNDERTAKEN**

S.No.	Title	Cost	Duration	PI/Co-PI	Agency
1	On development of Change Point based Multi Release Software Reliability Growth Models	1.3 lakh	15 Oct 2015-30 Oct 2016	PI	Delhi University R&D grant
2	Discrete multi-release Software Reliability Growth Modeling	1 lakh	15 Oct 2014-30 Sept 2015	PI	Delhi University R&D grant
3	Two Dimensional Software Reliability Growth Modeling and the related optimization Problems	1.2 lakh	June 2011-30 April 2012	PI	Delhi University R&D grant

**Academic Staff College Orientation/Refresher Course Attended:**

Name of the Course	Place	Duration	Sponsoring Agency
Refresher Course	CPDHE, DELHI	December 10, 2011 to December 31, 2011	CPDHE, University of Delhi
Refresher Course	CPDHE , DELHI	December 13, 2010 to January 4, 2011	CPDHE, University of Delhi
Orientation Programme	CPDHE ,DELHI	May 6, 2008 to June 3, 2008	CPDHE, University of Delhi