

CONTACT INFORMATION	Professor Department of Mathematics and Physics North Carolina Central University 1801 Fayetteville Street Durham NC 27707 USA	Cell: 919-601-9551 Phone: 919-530-6236 Fax: 919-530-6125 E-mail: ruma@nccu.edu URL: www.cs.nccu.edu/~ ruma
RESEARCH INTERESTS	Data Science, Energy-Efficient Resource Allocation, Robotics Networks, Wireless & Sensor Networks, Algorithm Design and Analysis, Combinatorial Optimization, Scheduling Theory, Logistics Planning, Distributed Systems and Multimedia Networking.	
EDUCATION	Ph.D. Computer Science NYU Tandon School of Engineering ¹ Dissertation: <i>Theoretical and Experimental Perspectives on Hard Scheduling Problems</i> . Advisor: Dr. Joel Wein, Technical Lead/Manager, Google, NY (Formerly Associate Professor at NYU Tandon School of Engineering.)	Jan 2001
	M.E. Computer Science Indian Institute of Science, Bangalore, India Thesis: <i>Implementation of CAIR-IISc Prolog</i> . Advisor: Dr. Vijaya Chandru, Co-Founder & CEO, Strand Life Sciences, India (Formerly Professor at Indian Institute of Science.)	June 1994
	B.Sc. Mathematics University of Madras, Chennai, India	May 1990
PROFESSIONAL EXPERIENCE	Professor, Department of Mathematics & Physics, North Carolina Central University (NCCU), Durham, NC	2016 to present
	Associate Professor, Department of Mathematics & Physics, North Carolina Central University (NCCU), Durham, NC	2012 to 2016
	Associate Professor, Department of Mathematics & Computer Science, North Carolina Central University (NCCU), Durham, NC	2005 to 2012
	Assistant Professor, Department of Computer Science, University of Texas at Dallas (UTD), Richardson, TX	2000 to 2005
	Research Assistant, Department of Computer and Information Science, NYU Tandon School of Engineering, Brooklyn, NY	1999 to 2000
	Teaching Assistant, Department of Computer and Information Science, NYU Tandon School of Engineering, Brooklyn, NY	1994 to 1999
	Intern, Center for Artificial Intelligence & Robotics, Bengaluru, India	1993 to 1994
	Intern, Kirloskar Computer Services Ltd., Bengaluru, India	Summer 1993
	Intern, Center for Artificial Intelligence & Robotics, Bengaluru, India	Summer 1992

¹Formerly known as Polytechnic University, Brooklyn, NY.

AWARDS AND
SCHOLARSHIPS

- Leadership Award: Advisor of the Year 2002-2003, University of Texas at Dallas.
- Pearl Brownstein Doctoral Research Award (Polytechnic University), 1999, for doctoral research showing great promise in the field of Computer Science.
- Deborah Rosenthal, M.D. Award (Polytechnic University), 1996, for outstanding performance on the Computer Science Ph.D qualifying examination.
- GATE (Graduate Aptitude Test in Engineering) Scholarship (a national level scholarship in India), 1992-1994.
- Indian Institute of Science Merit Scholarship, 1990-1992.

COURSES TAUGHT
AT NCCU

- [1] (**Undergraduate**) MATH 1000 Introductory College Algebra
- [2] (Undergraduate) MATH 1100 College Algebra and Trigonometry I
- [3] (Undergraduate) MATH 1200 College Algebra and Trigonometry II
- [4] (Undergraduate) MATH 2010 Calculus and Analytic Geometry I (traditional and PBL Sections)
- [5] (Undergraduate) MATH 2020 Calculus and Analytic Geometry II (traditional and PBL Sections)
- [6] (Undergraduate) MATH 4930 Special Topics: PIC Math (Preparing Students for Industrial Career in Mathematics)
- [7] (Undergraduate) COMP 1060 Introduction to Programming: A Multimedia Approach (Alice and Media Computation)
- [8] (Undergraduate) COMP 1520 Programming II: C++
- [9] (Undergraduate) COMP 2110/CRJU 2110 Introduction to Computers and Their Applications
- [10] (Undergraduate) COMP 2115/CRJU 2115 Introduction to Computer and Network Security
- [11] (Undergraduate) COMP 2200 Logic for the Mathematical Sciences
- [12] (Undergraduate) COMP 2810 Data Structures (C++)
- [13] (Undergraduate) COMP 3105/CRJU 3105 Cyber Forensic Investigations: Tools, Analysis and Testimony (Part I)
- [14] (Undergraduate) COMP 3810 Design and Analysis of Algorithms
- [15] (Undergraduate) COMP 4730 Organization of Programming Languages
- [16] (Undergraduate) COMP 4910 Special Topics: Distributed Systems
- [17] (Undergraduate) COMP 4910 Special Topics: Computer Networks
- [18] (Undergraduate) COMP 4910 Special Topics: Programming Competition Practice
- [19] (Undergraduate) CEMA 2500 Programming Tools for Statistical Computing
- [20] (Undergraduate) CEMA 4300 Introduction to Data Mining
- [21] (Undergraduate) CEMA 4920 Capstone Project
- [22] (**Graduate**) CISG 5105 Advanced Algorithms and Data Structures
- [23] (Graduate) CISG 5115 Theory of Computation

NEW COURSES
INTRODUCED AT
NCCU

- [1] (Undergraduate) COMP 1010 Experiential Introduction to Robotics **(co-created)**
- [2] (Undergraduate) COMP 1060 Introduction to Programming: A Multimedia Approach (Alice and Media Computation)
- [3] (Undergraduate) COMP 2110/CRJU 2110 Introduction to Computers and Their Applications
- [4] (Undergraduate) COMP 2115/CRJU 2115 Introduction to Computer and Network Security
- [5] (Undergraduate) COMP 2615 Introduction to Computer Organization and Architecture **(co-created)**
- [6] (Undergraduate) COMP 3105/CRJU 3105 Cyber Forensic Investigations: Tools, Analysis and Testimony (Part I)
- [7] (Undergraduate) COMP 3110/CRJU 3110 Cyber Forensic Investigations: Tools, Analysis and Testimony (Part II)
- [8] (Undergraduate) COMP 4615 Inter-Planetary Internet: Issues in Delay-Tolerant Networks
- [9] (Undergraduate) CEMA 1500 Discovering Mathematics
- [10] (Undergraduate) CEMA 2500 Programming Tools for Statistical Computing
- [11] (Undergraduate) CEMA 4300 Introduction to Data Mining
- [12] (Undergraduate) CEMA 4340 Statistical Inference
- [13] (Undergraduate) CEMA 4350 Regression Modeling
- [14] (Undergraduate) STEM 1100 Freshman STEM Project Design Course I **(co-created)**
- [15] (Undergraduate) STEM 1105 Freshman STEM Project Design Course II **(co-created)**

COURSES TAUGHT
AT UTD

- [1] (Undergraduate) Algorithm Analysis and Data Structures (C++) (including Honors Section)
- [2] (Undergraduate) Advanced Data Structures and Algorithms
- [3] (Graduate) Discrete Structures
- [4] (Graduate) Recent Advances in Scheduling Theory

NEW COURSES
INTRODUCED AT
UTD

- [1] (Graduate) Recent Advances in Scheduling Theory

GRANTS -
RESEARCH

- [1] NSF HBCU-UP Broadening Participation Research Project (PI)
"Broadening Participation Research Project: Research for Social Justice – Broadening Participation through Data Scienc". Amount Awarded: \$349, 957. Duration: July 2019-June 2022.
- [2] NSF CREST CENTER Phase II (co-PI on one of the research projects affiliated with the center)
"Cooperative Unmanned Robotic Vehicles for Exploration and Surveillance (CURVES) at the Computational Center for Fundamental and Applied Science and Education at North Carolina Central University". Amount Awarded: \$5M for the CREST Center. Duration: February 2014-January 2019.

- [3] NSF CREST CENTER Phase I (co-PI on one of the research projects affiliated with the center)
 “Cooperative Autonomous Mobile Robotic Systems (CAMoRoS) at the Computational Center for Fundamental and Applied Science and Education at North Carolina Central University”. Amount Awarded: \$5M for the CREST Center. Duration: September 2008-August 2013.
- [4] NASA UNIVERSITY RESEARCH CENTER (co-PI on one of the research projects affiliated with the center)
 “NASA Center for Aerospace Device Research and Education at North Carolina Central University”. Amount Awarded: \$5M for the URC. Duration: November 2009-November 2014.
- [5] ARMY RESEARCH OFFICE (co-PI)
 “Realizing the Future Force: Research Issues in Robotics, Vision and Networking at North Carolina Central University”. Amount Awarded: \$600,000. Duration: September 2008-August 2011.
- [6] OFFICE OF NAVAL RESEARCH (one of the two NCCU Project Leads)
 “CUST: Comprehensive Unmanned Systems for Force Protection Support”. Amount Requested: \$124,055 (funding specifics handled by HBCU/MI Project Office representing NCCU). Duration: August 2007-July 2010.
- [7] NC SPACE GRANT (PI)
 “Terrestrial Internet to Cosmic Internet: Issues and Design”. Amount Awarded: \$10,000 with a mandatory 100% matching from NCCU. Duration: July 2007-June 2008.
- [8] NCCU FACULTY SENATE SEED GRANT (PI)
 “Protocols Towards Improving QoS in Wireless Networks”. Amount Awarded: \$2000. Duration: January 2006-October 2006.
- [9] CLARK FOUNDATION RESEARCH INITIATION GRANT (Administered by Erik Jonsson School of Engineering and Computer Science at UTD.) (one of the two PIs)
 “Scheduling delivery of distributed multimedia information”; UTD, Texas. Amount Awarded: \$48,000. Duration January 2002-December 2002.

GRANTS -
EDUCATION

- [10] Department of Education Minority Science and Engineering Improvement Program (MSEIP) (co-PI)
 “A Multifaceted Approach to Comprehensive Institutional STEM Enhancement”. Amount Awarded: \$750,000. Duration: September 2019-August 2022.
- [11] NSF Targeted Infusion Project (co-PI)
 “Development of a Computational and Engineering Mathematics Program Concentration at NCCU” Amount Awarded: \$398,207. Duration: August 2015- July 2018.
- [12] UNC GENERAL ADMINISTRATION GEAR UP (co-PI)
 “GEAR UP for Robotics and NExT at NCCU”. Amount Awarded: \$15,892. Duration: June-July 2011.
- [13] UNC GENERAL ADMINISTRATION GEAR UP (co-PI)
 “GEAR UP Senior Day”. Amount Awarded: \$1,040. Duration: March 2011.
- [14] UNC GENERAL ADMINISTRATION GEAR UP (co-PI)
 “GEAR UP for Robotics and NExT at NCCU”. Amount Awarded: \$12,435. Duration: June-July 2010.

- [15] ARMY RESEARCH OFFICE HIGH SCHOOL APPRENTICESHIP PROGRAM (co-PI)
 “Research Experience for High School Seniors in Robotics, Computer Vision and Networking”. Amount Awarded: \$6,000 (this is an addendum to our existing Army Research Office Grant). Duration: June 2010-May 2011.
- [16] NSF TARGETED INFUSION (co-PI)
 “Targeted Infusion Grant: Computational Sciences and Robotics Education at North Carolina Central University”. Amount Awarded: \$148,930. Duration: September 2008-August 2010.
- GRANTS - EQUIPMENT
- [17] NSF CLOUD LAB (co-PI)
 “Spectrum Aware Cloud Offloading”. Access to NSF sponsored cloud platforms Chameleon and CloudLab for experimental studies. Awarded: Access to Cloud-Lab starting Jan 2015.
- [18] STANFORD UNIVERSITY (NSF/GENI) (PI)
 “OpenFlow for Collaborative Networking”. Amount Awarded:\$15,000 worth of three Pronto 3290 network switches.
- [19] SUN MICROSYSTEMS INC. ACADEMIC EXCELLENCE GRANT (PI)
 “Efficient Adaptive Algorithms for Internet Advertisement Scheduling”. Amount Awarded: \$32,035 worth of equipment. Duration: June 2006-May 2009.
- [20] SUN MICROSYSTEMS INC. ACADEMIC EQUIPMENT GRANT (one of the two PIs)
 “Multi-layer approaches for reliable multimedia delivery over heterogeneous networks”; other PI: K.P. Subbalakshmi, Stevens Institute of Technology, New Jersey. Amount Awarded: \$52,000 worth of equipment. Duration: June 2001-May 2003.
- BOOKS
- [1] **(Networking)** “Spectrum-Aware Mobile Computing - Convergence of Cloud Computing and Cognitive Networking”, Syed Eman Mahmoodi, K. P. Subbalakshmi and R. N. Uma, Springer International Publishing (ISBN: 978-3-030-02411-6) (Series Title: Signals and Communication Technology), 2019.
- BOOK CHAPTERS
- [2] **(Networking)** “Spectrum Aware Mobile Computing using Cognitive Networks”, S. E. Mahmoodi, K. P. Subbalakshmi, and R. N. Uma, *Handbook of Cognitive Radio - Section: Dynamic Spectrum Access and Sharing*, Springer, Eds: Dusit Niyato and Ping Wang, EiC: Wei Zhang (invited), May 2017, pp. 1-28.
- [3] **(Data Science)** “Characterizing and Predicting Yelp Users’ Behavior”, Parvathy Jayaprakasan, R. N. Uma and A. Sankarasubramanian, *Highlighting the Importance of Big Data Management and Analysis for Various Applications*, Springer’s Studies in Big Data Book series (SBD), editors: Mohammad Moshirpour, Behrouz Far and Reda Alhajj, Volume 27, pp. 17-35, 2018. (Preliminary Version was presented in *International Symposium on Big Data Management and Analytics (BIDMA)*, Calgary, April 2016.)
- JOURNAL PUBLICATIONS
- [4] **(Networking)** “Optimal Joint Scheduling and Cloud Offloading for Mobile Applications”, S. Eman Mahmoodi, R. N. Uma and K. P. Subbalakshmi, *IEEE Transactions on Cloud Computing*, Vol. 7, Issue 2, pp. 301-313, April-June 2019.

- [5] **(Networking)** “A New Comprehensive RSU Installation Strategy for Cost-Efficient VANET Deployment”, Donghyun Kim, Yesenia Velasco, Wei Wang, R. N. Uma, Rasheed Hussain, Sejin Lee, *IEEE Transactions on Vehicular Technology (TVT)*, vol. 66, issue 5, pp. 4200-4211, May 2017.
- [6] **(Networking)** “Minimum Latency Multiple Data MULE Trajectory Planning in Wireless Sensor Networks”, Donghyun Kim, R. N. Uma, Baraki H. Abay, Weili Wu, Wei Wang and Alade O. Tokuta. *IEEE Transactions on Mobile Computing*, Volume 13, No. 4, April 2014. (Preliminary version appeared in *INFOCOM* 2012.)
- [7] **(Networking)** “Battery Power-Aware Encryption”, R. Chandramouli, S. Bapatla, K. P. Subbalakshmi and R. N. Uma. *ACM Transactions on Information and System Security (TISSEC)*, Volume 9, Issue 2 (May 2006).
- [8] **(Scheduling Theory)** “An Experimental Study of LP-Based Approximation Algorithms for Scheduling Problems”, Martin W.P. Savelsbergh, R. N. Uma and Joel Wein. *INFORMS Journal on Computing* 17, 1 (Winter 2005). (Preliminary version appeared in *SODA* 1998.)
- [9] **(Scheduling Theory)** “On the Relationship between Combinatorial and LP-Based Approaches to NP-hard Scheduling Problems”, R. N. Uma, Joel Wein and David P. Williamson. *Theoretical Computer Science*, 2005. (Preliminary version appeared in *IPCO* 1998.)
- [10] **(Networking)** “Dynamic Wavelength Assignment for Multicast in All-Optical WDM Networks to Maximize the Network Capacity”, Jianping Wang, Biao Chen and R. N. Uma. *IEEE Journal on Selected Areas in Communications (JSAC)* 21(8) (October 2003).
- [11] **(Scheduling Theory)** “Techniques for Scheduling with Rejection”, Daniel W. Engels, David R. Karger, Stavros G. Kolliopoulos, Sudipta Sengupta, R. N. Uma and Joel Wein. *Journal of Algorithms* 49 (2003). (A special issue devoted to papers selected from *ESA* 1998.) (Preliminary version appeared in *ESA* 1998.)
- [12] **(Databases)** “Clustering of Client-Sites in Three-Tier Database Architectures”, Je-Ho Park, Vinay Kanitkar, R. N. Uma and Alex Delis. *International Journal of Cooperative Information Systems*, 12(1), March 2003. (Preliminary version appeared in *ICTAI* 1999.)
- [13] **(Scheduling Theory)** “Off-line Admission Control for General Scheduling Problems”, Cynthia A. Phillips, R. N. Uma and Joel Wein. *J. of Scheduling*, Vol. 3, No. 6, November-December 2000: Spl. Issue on Approximation Algorithms (Part 2). (Preliminary version appeared in *SODA* 2000.)
- CONFERENCE PUBLICATIONS - PEER REVIEWED [14] **(Networking)** “Harnessing Spectrum Awareness to Enhance Mobile Computing”, Syed Eman Mahmoodi, K.P. Subbalakshmi and R.N.Uma, *ACM The 22nd International Conference on Mobile Computing and Networking (Mobicom)*, pp: 460-461, October 2016.
- [15] **(Networking)** “Cost Effective Mobile and Static Road Side Unit Deployment for Vehicular Adhoc Networks”, Donghyun Kim, Yesenia Velasco, Zishen Yang, Wei Wang, Rasheed Hussain, R.N. Uma, *Proceedings of International Workshop on Computing, Networking and Communications (CNC)* in conjunction with *International Conference on Computing, Networking and Communications (ICNC 2016)*, February 15-18, 2016, Kauai, Hawaii, USA.

- [16] **(Networking)** “Energy-Efficient Routing through Weighted Load Balancing”, Donovan Bradley and R. N. Uma. *IEEE Global Communications Conference (GLOBECOM)*, December 2012.
- [17] **(Networking)** “Minimum Latency Multiple Data MULE Trajectory Planning in Wireless Sensor Networks”, Donghyun Kim, R. N. Uma, Baraki H. Abay, Weili Wu, Wei Wang and Alade O. Tokuta. *Proceedings of IEEE INFOCOM*, March 2012.
- [18] **(Networking)** “Algorithms for Improved Network Lifetime of Cooperative Autonomous Mobile Robotic Systems”, Amlakawit A. Medhin, R. N. Uma and Alade O. Tokuta. *Military Communications Conference (MILCOM)*, October-November 2010.
- [19] **(Networking)** “MDC and Path Diversity in Video Streaming”, Siva Somasundaram, K. P. Subbalakshmi and R. N. Uma. *International Conference on Image Processing (ICIP)*, October 2004.
- [20] **(Networking)** “Energy-Aware On-line Algorithms for Image Transmission over Wireless LAN”, R. Chandramouli, S. Sri Ganesh Veera Kumar and R. N. Uma. *IEEE International Conference on Communications (ICC)*, June 2004.
- [21] **(Steganography)** “On the Complexity and Hardness of the Steganography Embedding Problem”, R. Chandramouli, Shalin Trivedi and R. N. Uma. *SPIE's 16th Ann. Symposium Electronic Imaging Science and Technology*, January 2004.
- [22] **(Scheduling Theory)** “Task Planning with Transportation Constraints: Approximation Bounds, Implementation and Experiments”, Ovidiu Daescu, Derek Soeder and R. N. Uma. *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2003.
- [23] **(Networking)** “To Transmit or Not to Transmit: an Investigation using Competitive Analysis”, R. Chandramouli and R. N. Uma. *Proc. of the IEEE Wireless Communications and Networking Conference (WCNC)*, March 2003.
- [24] **(Networking)** “On Deterministic Scheduling Approaches to Delivery of Scalable Streaming Media”, Derek Soeder, K. P. Subbalakshmi and R. N. Uma. *Proc. of the World Multiconference on Systemics, Cybernetics and Informatics (SCI)*, July 2002.
- [25] **(Scheduling Theory)** “Off-line Admission Control for General Scheduling Problems”, Cynthia A. Phillips, R. N. Uma and Joel Wein. *Proc. of the 11th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, January 2000.
- [26] **(Databases)** “Clustering of Client-Sites in Three-Tier Database Architectures”, Je-Ho Park, Vinay Kanitkar, R. N. Uma and Alex Delis. *Eleventh IEEE International Conference on Tools with Artificial Intelligence*, November 1999.
- [27] **(Scheduling Theory)** “Techniques for Scheduling with Rejection”, Daniel W. Engels, David R. Karger, Stavros G. Kolliopoulos, Sudipta Sengupta, R. N. Uma and Joel Wein. *Proceedings of the 6th Annual European Symposium on Algorithms (ESA)*, August 1998. Gianfranco Bilardi, Giuseppe F. Italiano, Andrea Pietracaprina and Geppino Pucci (eds.): *Algorithms - ESA '98*, LNCS 1461, Springer: Berlin, 1998.
- [28] **(Scheduling Theory)** “On the Relationship between Combinatorial and LP-Based Approaches to NP-hard Scheduling Problems”, R. N. Uma and Joel Wein. *Proc. of the 6th Intl. IPCO Conf.*, June 1998. R. E. Bixby, E. A. Boyd, and R. Z. Rios-Mercado (eds.): *Integer Programming and Combinatorial Optimization*, LNCS 1412, Springer: Berlin, June 1998.

- [29] **(Scheduling Theory)** “An Experimental Study of LP-Based Approximation Algorithms for Scheduling Problems”, Martin W.P. Savelsbergh, R. N. Uma and Joel Wein. *Proceedings of the 9th Annual ACM-SIAM Symp. on Discrete Algorithms (SODA)*, January 1998.
- [30] **(Parallel Computing)** “Load-Sharing in Heterogeneous Systems via Weighted Factoring”, Susan Flynn Hummel, Jeanette Schmidt, R. N. Uma and Joel Wein. *Proceedings of the 8th Symposium on Parallel Algorithms and Architectures (SPAA)*, June 1996.
- TECHNICAL REPORTS
- [31] “A Customized GUI Animator Tool for the Network Simulator OMNeT++”, Jabre Thornton, Donovan Bradley, R N. Uma and Alade Tokuta, NCCU College of Science & Technology Annual Undergraduate Research Symposium, 2012. (Jabre Thornton, an undergraduate student won 3rd prize for this presentation at the NCCU CST Annual Undergraduate Research Symposium, 2012).
- [32] “Modeling Multi-Touch Attribution for the Advertising Industry”, Derrick Swick, Bennett McAuley, Matthew Gallatin, R. N. Uma, Alade Tokuta, NCCU College of Arts and Sciences Graduate and Undergraduate Research Symposium, 2018.
- [33] “Spring Constant of Cast-in-Place Piles”, Bennett McAuley, Derrick Swick, Matthew Gallatin, R. N. Uma, Alade Tokuta, NCCU College of Arts and Sciences Graduate and Undergraduate Research Symposium, 2018.
- PAPERS UNDER REVIEW
- [34] **(Under Review)** “Optimal Cognitive Scheduling and Cloud Offloading for Time-Adaptive Mobile Applications”, S. E. Mahmoodi, K. P. Subbalakshmi and R. N. Uma, *IEEE Transactions on Mobile Computing (TMC)*.
- PRESENTATIONS
- [1] “Load-Sharing in Heterogeneous Systems via Weighted Factoring”
- ACM Symposium on Parallel Algorithms and Architectures (SPAA), 1996.
- [2] “On the Relationship between Combinatorial and LP-Based Approaches to NP-Hard Scheduling Problems”
- ACM-SIAM Symposium on Discrete Algorithms (SODA 1998)
 - Integer Programming and Combinatorial Optimization (IPCO 1998)
 - Columbia University Joint IEOR-MS Colloq. (1998)
 - INFORMS National Meeting (Seattle 1998)
 - Santa Clara University (2000),
 - University of Connecticut (2000),
 - Rutgers University at Camden (2000),
 - University of Texas at Dallas (2000),
 - University at Buffalo (SUNY) (2000),
 - Washington State University at Pullman (2000),
 - Iowa State University (2000),
 - Temple University (2000),
 - SUNY Stony Brook (2000),
 - SUNY Albany (2000),
 - Mississippi State University (2000),

- DePaul University (2000),
 - UMIACS College Park (2000).
- [3] “Techniques for Scheduling with Rejection”
- European Symposium on Algorithms (ESA 1998)
 - Workshop on Models and Algorithms for Planning and Scheduling Problems (MAPSP, Renesse, The Netherlands, 1999)
- [4] “Off-line Admission Control for General Scheduling Problems”
- ACM-SIAM Symposium on Discrete Algorithms (SODA 2000)
 - International Symposium on Mathematical Programming (ISMP, Atlanta, 2000)
- [5] “On Deterministic Scheduling Approaches to Delivery of Scalable Streaming Media”
- World Multi-Conference on Systemics, Cybernetics and Informatics (SCI 2002)
 - Annual Conference of the Operational Research Society of Italy (AIRO): Integrating Operations Research and Information Technology to Support Decisions in Real World Systems (2002)
- [6] “Online Algorithms for Energy Efficient Wireless Transmission”
- IEEE Wireless Communications and Networking Conference (New Orleans 2003)
 - NYU Tandon School of Engineering (2003)
 - IEEE International Conference on Communications (ICC, Paris, 2004)
 - North Carolina Central University (2005)
- [7] “On the Complexity and Hardness of the Steganography Embedding Problem”
- SPIE’s 16th Annual Symposium Electronic Imaging Science and Technology, San Jose, 2004
- [8] “Characterizing Yelp Users”
- International Symposium on Big Data Management and Analytics (BIDMA) (Calgary 2016)
- [9] “Math + CEMA: Computational and Engineering Mathematics Concentration for Mathematics Majors at NC Central University”
- MAA MathFest, Cincinnati, OH, July-August, 2019.
- [10] “Data Science for Social Justice: An Approach to Broaden Participation”
- IEEE Integrated STEM Education Conference, Virtual, July 2020. (Workshop co-presented with Rebecca Zulli Lowe.)

PROFESSIONAL
SERVICE

Guest Editor

- Theoretical Computer Science, Special Issue on papers selected from COCOON 2020, Elsevier, Donghyun Kim (Lead), and R.N. Uma, ed. (in process).
- Theoretical Computer Science, Special Issue on Combinatorial Optimization and Applications (selected papers from COCOA 2018), Elsevier, Donghyun Kim, R. N. Uma (2019-2020).

- Wireless Communications and Mobile Computing, Special Issue on Algorithm Optimization for Wireless Mobile Applications of Smart Cities, Wiley (Hindawi), Donghyun Kim (Lead), Michele Nogueira, R. N. Uma, ed. (2018-2019).
- IEEE Transactions on Network Science and Engineering, Special Issue on Scalability and Privacy in Social Networks, IEEE, Donghyun Kim (Lead), My T. Thai, and R.N. Uma, ed., Vol. 7, Issue 2, Apr-Jun 2020.

TPC Co-Chair

- 26th International Computing and Combinatorics Conference (COCOON), Virtual, August 2020
- 12th Annual International Conference on Combinatorial Optimization and Applications (COCO), Atlanta, December 2018.
- 6th International Conference on Computational Social Networks (CSoNet), co-located with COCOON 2017.

Publications Chair

- Second International Conference on Cognitive Radio Oriented Wireless Networks and Communications (CrownCom), 2007.

Sessions Chair

- SAC Symposium - Social Networks, IEEE GLOBECOM 2016.
- Multimedia Content Distribution (MCSSS-02) at IEEE GLOBECOM 2007.

Co-Organizer

- Data Science and Machine Learning Workshop, co-sponsored by SAMSI and NCCU, March 2019.
- Statistics in the Criminal Justice System Workshop, co-sponsored by SAMSI and NCCU, March 2018.
- Special Track on *Doctoral Dissertation in Multimedia*, IEEE International Symposium on Multimedia, 2006.

Technical Program Committee Member

- International Workshop on Multimedia Signal Processing Techniques and Applications, 2014.
- International Symposium on Women in Computing and Informatics, 2014, 2015.
- IEEE GLOBECOM (different symposiums) 2007, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017.
- IEEE International Conference on Communications (ICC) (different symposiums), 2003, 2005, 2007, 2012, 2013.
- International Conference on Computing, Networking and Communications, 2012.
- International Conference on Communications and Networking in China (CHINACOM), Multimedia Communications Symposium, 2009.
- IEEE Consumer Communications and Networking Conference (CCNC), 2007 & 2008.
- IEEE International Symposium on Multimedia (ISM), 2005 & 2006.
- IEEE International Workshop on Adaptive Wireless Networks (AWiN), 2004 & 2005 (GLOBECOM satellite workshop).
- IEEE International Workshop on Networking Issues in Multimedia Entertainment (NIME) (GLOBECOM 2004 satellite workshop).

NSF Panelist

- NSF-ITR Program.

Reviewer - Journals

- Acta Informatica
- Computers & Industrial Engineering

- Discrete Mathematics, Algorithms and Applications
- European Journal of Operational Research
- IEEE Journal on Selected Areas in Communications
- IEEE Transactions on Circuits and Systems for Videotechnology
- IEEE Transactions on Control Systems Technology
- Information & Computation
- Information Processing Letters
- INFORMS Journal on Computing
- International Journal of Computers and Their Applications (a publication of ISCA)
- Journal of Algorithms
- Journal of Combinatorial Optimization
- Journal of Scheduling
- Journal of Systems Science and Systems Engineering
- Journal of Universal Computer Science (Springer)
- Naval Research Logistics
- Optimization Letters
- SIAM Journal on Computing (SICOMP)
- Theoretical Computer Science A

Reviewer - Conferences

- European Symposium on Algorithms (ESA 2003)
- IEEE Consumer Communications and Networking Conference (CCNC 2007 & 2008)
- IEEE GLOBECOM (2007, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017)
- IEEE INFOCOM (2004)
- IEEE ICC (2003, 2004, 2005, 2007, 2009, 2012, 2013)
- IEEE International Symposium on Multimedia (ISM 2005, 2006, 2007)
- IEEE International Workshop on Adaptive Wireless Networks (AWiN (GLOBECOM) 2004, 2005)
- IEEE International Workshop on Networking Issues in Multimedia Entertainment (NIME (GLOBECOM) 2004)
- IEEE Wireless Communications and Networking Conference (WCNC 2005 & 2007)
- 6th International Conference on Computational Social Networks (CSoNet), co-located with COCOON 2017
- 12th International Conference on Combinatorial Optimization and Applications (COCOA), 2018.
- International Computing & Combinatorics Conference (COCOON 2011, 2015, 2016, 2020)
- International Conference on Communications and Networking in China (CHINACOM 2008, 2009)
- International Conference on Supercomputing (ICS 1997)
- International Symposium on Women in Computing and Informatics, 2014, 2015.
- Systemics, Cybernetics and Informatics (SCI 2004)

Reviewer - Proposals

- NC Space Grant Higher Education Proposals (2008, 2009)

UNIVERSITY
SERVICE

North Carolina Central University

- Lead, Academic Program Review for Mathematics programs and author of the associated self-study report, November 2019 - present
- Transfer Service Coordinator for Computer Science, April 2020 - present.
- Member of Chair Search Committee, Department of Mathematics and Physics, Fall 2018 - Spring 2019.

- Assessment Coordinator, Undergraduate and Graduate Mathematics Program, Department of Mathematics and Physics, May 2017 - present.
- Introduced PBL in Calculus I and Calculus II courses.
- Co-created *Computational and Engineering Mathematics* concentration for undergraduate Mathematics Majors.
- Chair, Mathematics Curriculum Committee, Department of Mathematics and Physics, Aug 2016-present.
- Member, Advisory Council, Computer Science and Business Program, Aug 2014-Mar 2015.
- Member of the Math Faculty Search Committee, Department of Mathematics and Physics, Summer 2014-Fall 2014.
- Member, Reappointment, Promotion and Tenure Committee, Department of Mathematics and Physics, Fall 2012-present.
- Senator, Faculty Senate, representing Department of Mathematics and Physics, Fall 2012-Spring 2014.
- Contributed significantly to the development of the new program following CS-CIS merger Spring 2012-Spring 2014.
- Senator, Faculty Senate, representing Department of Mathematics and Computer Science, Fall 2011-Spring 2012.
- Member of the College of Science and Technology Curriculum Committee, representing Department of Mathematics and Computer Science, Fall 2011-Spring 2012.
- Member of the Chair Search Committee, Department of Mathematics and Computer Science, Spring-Fall 2011 (suspended search).
- Chair of the Faculty Search Committee, Department of Mathematics and Computer Science, Spring 2009 & Spring 2010.
- Member of the Faculty Search Committee, Department of Mathematics and Computer Science, Spring 2006.
- Member of the Curriculum Committee, Department of Mathematics and Computer Science, Spring 2006-present.
- Member of the Undergraduate Handbook Committee, Department of Mathematics and Computer Science, Fall 2006.
- Designed the Cyber Forensics Concentration for Criminal Justice Majors, Fall 2006-Spring 2007.
- Member of the Computational Science Committee, College of Science and Technology, Fall 2006-Spring 2008.

University of Texas at Dallas

- Member of the Graduate Admissions Committee (CS Department, UTD, September 2000-August 2002).
- Member of the Core Committee for the Support of Women and Minorities, that reports directly to the university president (UTD, September 2001-August 2003).
- Member of the Computer Science Department Library Committee (CS Department, UTD, September 2003-August 2005).

PROFESSIONAL OUTREACH AND VOLUNTEER ACTIVITIES

- Organized and co-hosted a visit for Southeast Raleigh High School students in Grades 9 & 10 (IT/Cyber-security and Engineering Academy Students) to the Department of Mathematics & Physics. Additionally, made a joint presentation on Data Science for this group of students, Feb 28, 2020.
- Initiated and represented the Department of Mathematics and Physics (separate from NCCU's admissions office) at Enloe High School – College and Career Fair, Nov 15, 2019.
- Organized and co-hosted “Department Showcase Luncheon” for guidance counselors from Durham Public Schools, Nov 1, 2019.
- Organized and co-hosted “Department Showcase Luncheon” for guidance coun-

selors from Wake County Public Schools, Oct 9, 2019.

- Initiated and represented the Department of Mathematics and Physics (along with NCCU's admissions office) at Panther Creek High School – SMART Lunch College Visit, Oct 4, 2019.
- Career Day Presentation at Daniels Middle School, Raleigh, February, 2018.
- Coordinating Board Member, Women and Math Mentoring.
- Judge, Durham Public Schools' Math Fair.
- Women and Math Mentoring - M-Cubed: Invited Talk "Math: What is it Good For?" presented to 8th grade girls.
- GEAR UP for Robotics and NExT at NCCU: Co-organized a 1-week residential camp and co-taught the modules on programming and robotics, Summer 2011.
- GEAR UP Senior Day: Co-organized a 1-day campus visit for prospective high school seniors.
- Summer Ventures: Co-taught a course module on "Integrated Robotics, Computer Vision and Networking", Summer 2010.
- GEAR UP for Robotics and NExT at NCCU: Co-organized a 1-week residential camp and co-taught the modules on programming and robotics, Summer 2010.
- High School Apprenticeship Program (HSAP): Supervised two high school students in research projects funded by the Army Research Office, Summer 2010.
- RoboCamp at NCCU: Co-organized a 2-week day camp and co-taught the modules on programming and robotics, Summer 2009.
- Scientific Judge, Regional Science Bowl (held at NCCU), 2007, 2011 & 2012.
- Volunteer, Women and Math Mentoring Program – mentored 8th grade girls to encourage them to stay in Math and eventually pursue a STEM career, 2007, 2008.
- Workshop Session Leader, Women and Math Mentoring Program's Marjorie Lee Browne Day – introduced 8th grade girls to computer programming using Alice, 2009, 2010, 2011, 2012.
- Session leader, Exploring Engineering under the Women Inspiring Learning Momentum program – introduced 8th grade girls to computer programming using Alice, 2010, 2011, 2012.

ADVISEES

Capstone (or Senior Seminar) Project Advisor (at NCCU)

- "Influence of Socio-Economic Factors on the COVID-19 Pandemic", (co-advisor), Rithika Vaka, Fall 2020 (ongoing).
- "Designing and Implementing a Course Scheduling Tool at NCCU", Derrick Swick, Spring 2019.
- "Predictive Modeling for Crime Incidents in Durham, North Carolina", (co-advisor), Bennett McAuley, Fall 2018.
- "A Graphical Representation of Picture Languages", Aaron Artis, Spring 2013.
- "NCCU Banner Information System - Making it User-Friendly for Student Advising: A Proof of Concept", Tonya Harrison, Fall 2009.
- "Efficient Email Indexing Using B-Trees", Victor Medina, Fall 2007.
- "Adword Matching Problem", Michael Best, Fall 2006.
- "Investigation into Energy Efficient Packet Transmission: Lazy Scheduling", Sam Adu, Fall 2006.
- "Spatial Data Mining", Sekeya Francis, Spring 2006.

Undergraduate Honors Thesis Advisor (at UTD)

- "Geometric Algorithms for the Coverage Problem in Sensor Networks", Irfan Shaddad, Undergraduate Honors Thesis, 2004.

MS Thesis Advisor (at NCCU)

- "Data-driven Methods to Improve College Graduation and Retention", (co-advisor), Parvathy Jayaprakasan, Spring 2018.

- “Path Planning Algorithms to Minimize Data Latency in Wireless Sensor Networks”, (co-advisor), Baraki H. Abay, Summer 2012.
- “Energy-Efficient Routing in Robotics Networks through Weighted Load Balancing”, Donovan J. Bradley, Spring 2011.
- “Energy-Efficient Wireless Communication in Cooperative Autonomous Mobile Robotic Systems”, Amlakawit A. Medhin, Spring 2010.

MS Thesis Advisor (at UTD)

- “Scheduling Under Machine Breakdowns: Approximation Bounds and Experimental Study”, Anagha Kulkarni, MS Thesis, 2004.
- “Combinatorial Scheduling Algorithms to Sequence Information Delivery”, Sukumar Ramaraj, MS Thesis (co-advisor), 2003.
- “Placement of Replicated Continuous Media Objects”, Deepti Chand Parvathani, MS Thesis (co-advisor), 2003.

PhD Dissertation Advisor (at NCCU)

- “Spectrum-Aware Cognitive Mobile Cloud Computing”, Seyed Eman Mahmoodi (co-advised with Dr. K. P. Subbalakshmi at Stevens Institute of Technology). (April 2017)

MS Thesis Committee Member (at NCCU)

- “Effective Minority Report Generation using Online Social Network”, MinHyuk Lee, Spring 2014.
- “Improvement and Acceleration of Epistasis Detection Algorithms using Parallelized Implementations and Graphics Processing Units”, James E. Rudd, Spring 2012.
- “Efficient Implementation of Optimal Area Triangulation Algorithms”, Tigran Mirzoev, Spring 2008.

MS/PhD Thesis Committee Member (at UTD)

- “Sorting by Exchanging Elements at Bounded Distance”, Sherry Fong, PhD Dissertation, 2005.
- “Parallel Algorithms for High Performance Switching in Communication Networks”, Enyue Lu, PhD Dissertation, 2004.
- “End-to-End QoS Guarantee in Heterogeneous Wired-Cum-Wireless Networks”, Satish Satyamurthy, MS Thesis, 2003.
- “Improved Bounds for the Online Scheduling Problem”, John F. Rudin III, PhD Dissertation, 2001.

External MS/PhD Thesis Committee Member

- “Battery Power-Aware Encryption”, Satish Bapatla, MS Thesis, Stevens Institute of Technology, 2004.

Summer Research Projects Advisor (at NCCU)

- **DREAM-STEM:** “Reservoir-Induced Seismicity”, (co-advised) Nubia Morton, Summer 2019-Spring 2020.
- **Summer Ventures in Science and Mathematics:** “Exploring Steganography: Encoded Messages in Multimedia”, Vishal J. Mehta, and Vivek C. Patel, Summer 2010.
- **Summer Ventures in Science and Mathematics:** “Network Animator Tool”, Pradeep Gopinathan, Summer 2008, **Catalyst Award Winner in Mathematics** (presented at The North Carolina Council of Teachers’ State Meeting on Oct 30, 2008).

FIRST/KNOWN
AFFILIATION OF
ADVISEES

NCCU - MS Thesis & Capstone/Senior Seminar Students

- Derrick Swick, Embedded Software Applications Engineer, Ford Motor Company, Cary, NC.

- Bennett McAuley, Associate Technical Writer, SAS, NC.
- Parvathy Jayaprakasan, Intern, Informaticist I, Duke Clinical Research Institute Data Solutions at Duke University, NC.
- Baraki H. Abay, Software Developer, Amreli Technology Solutions, Redmond, WA.
- Donovan J. Bradley, QA Engineer, Progress Software, Morrisville, NC.
- Amlakawit A. Medhin, PhD student in Computer Science and Engineering at North Carolina State University, NC.
- Aaron Artis, Associate Software Engineer at TOSHIBA Global Commerce Solutions, Inc, RTP, NC
- Tonya Harrison, Social Security Administration, Baltimore, MD.
- Victor Medina, Founder & Engineer at BigBit Technologies, Greater Seattle Area, WA.
- Michael Best, Software Engineer, EPSCoR Cyber at University of Hawaii at Hilo, HI.
- Sam Adu, N/A.
- Sekeya Francis, Websphere Extreme Scale Tester, IBM, RTP, NC.

UTD - MS & Undergraduate Honors Thesis Students

- Anagha Kulkarni, Software Engineer, Google, Mountain View, CA.
- Sukumar Ramaraj, Director Product Management, Hewlett-Packard, Dallas/Ft.Worth, TX.
- Deeptichand Parvathaneni, Attorney, Law Firm of Sim, Parvathaneni & Brown, PLLC, Dallas, TX.
- Irfan Shahdad, Manager, Product Management - Cisco Cloud Unified Communications, Dallas/Ft.Worth, TX.

PROFESSIONAL DEVELOPMENT

Attended (and/or presented at) the following conferences/workshops/seminars.

- Designing Effective Online Courses, UNC System Digital Learning Initiative, July 2020.
- IEEE Integrated STEM Education Conference, Virtual, July 2020.
- The Layered Curriculum Workshop, NCCU Office of Faculty Professional Development, June 2020.
- Workshop: Creating the Motivational Syllabus, NCCU Office of Faculty Professional Development, June 2020.
- Blackboard Training: Continuity of Instruction – “A State of Readiness” Workshop, NCCU Faculty Development Den and Blackboard Office, March 2020.
- Instructional Continuity Training, NCCU Office of e-Learning, March 2020.
- NSF HBCU-UP/CREST PI/PD meeting, Washington D.C., February 2020.
- MAA MathFest, Cincinnati, OH, July-August, 2019.
- Data Science and Machine Learning Workshop, co-sponsored by SAMSI and NCCU, March 2019.
- 12th Annual International Conference on Combinatorial Optimization and Applications (COCOA), December 2018.
- Statistics in the Criminal Justice System Workshop, co-sponsored by SAMSI and NCCU, March 2018.
- Institute on Project-Based Learning, Worcester Polytechnic Institute, June 2017.
- PIC Math (Preparing for Industrial Careers in Mathematical Sciences), May 2016, Brigham Young University, Provo, Utah (*attendance through a selection process*).
- International Symposium on Big Data Management and Analytics (BIDMA), April 2016, University of Calgary, Calgary, Canada.
- IEEE RoboResearch Seminar, March 2015, UNC Charlotte, NC.
- Army Research Lab Open Campus Open House, December 2014, Adelphi, MD.
- Carolinas Women in Technology Roundtable and Luncheon, Hosted by Google, September 2014, Washington, D. C.

- Regional Workshop on Teaching an Undergraduate Parallel Programming Course with Pattern Programming, July 2014, UNC Charlotte, NC.
- IEEE INFOCOM Conference, March 2012, Orlando, FL.
- Open Networking Summit, October 2011, Stanford University, CA.
- NSF Crest Reverse Site Visit (attended & presented), April 2011, Washington, D.C.
- Department of Defense (DoD) National HBCU/MI Conference, March 2011, Atlanta, GA.
- IEEE GLOBECOM Conference, December 2010, Miami, FL.
- Military Communications Conference (MILCOM), Oct-Nov 2010, San Jose, CA.
- NSF Joint Annual Meeting, June 2009, Washington, D.C.
- QEM Workshop for NSF Mathematics and Science Partnership: Targeted Partnerships, June 2009, Baltimore, MD.
- Durham Public Schools' Technology Showcase, March 2009, Durham, NC.
- NSF Broadening Participation in Computing Community Meeting, February 2009, Charlotte, NC.
- RoboDevelopment Conference and Expo, November 2008, CA.
- Department of Homeland Security Workshop for Minority Serving Institutions, October 2008, John Jay College of Criminal Justice, NY.
- Robotics Collaborative Technology Alliance Open House, October 2008, Army Research Lab's Fort Indiantown Gap Robotics Research Facility, PA.
- Collaborative Technology Alliance (CTA) Opportunities Conference, August 2008, Research Triangle Park, NC.
- Army Science & Technology University (ASTU) Opportunities Conference, August 2008, Research Triangle Park, NC.
- NSF Sponsored Alice and Media Computation Workshop, July 2008, Las Vegas, NV.
- Workshop, June 2008, Pittsburgh, PA.
- ABET Workshop, October 2007, Baltimore, MD.
- IEEE GLOBECOM Conference, November 2007, Washington, D. C.
- Second International Conference on Cognitive Radio Oriented Wireless Networks and Communications (CrownCom), August 2007, Orlando, FL.
- Digital Forensics Instructors' Training Workshop, April 2007, Tulsa, OK.
- Information Assurance & Cyber Security Symposium at NC A&T, March 2007, Greensboro, NC.
- Digital Forensics and Information Assurance Workshop, December 2006, Tulsa, OK.
- Department of Defense Workshop on Writing Successful Grants, October 2006, Durham, NC. item DFWG Digital Forensics Workshop, January 2006, Orlando, FL.
- IEEE International Conference on Communications (ICC), June 2004, Paris, France.
- SPIE's 16th Annual Symposium Electronic Imaging Science and Technology, January 2004, San Jose, CA.
- IEEE Wireless Communications and Networking Conference (WCNC), March 2003, New Orleans, LA.
- Annual Conference of the Operational Research Society of Italy (AIRO): Integrating Operations Research and Information Technology to Support Decisions in Real World Systems, September 2002, L'Aquila, Italy.
- World Multi-Conference on Systemics, Cybernetics and Informatics (SCI), July 2002, Orlando, FL.
- International Symposium on Mathematical Programming (ISMP), August 2000, Atlanta, GA.
- ACM-SIAM Symposium on Discrete Algorithms (SODA), January 2000, San Francisco, CA.
- Workshop on Models and Algorithms for Planning and Scheduling Problems (MAPSP), June 1999, Renesse, The Netherlands.

- INFORMS National Meeting, October 1998, Seattle, WA.
- European Symposium on Algorithms (ESA), August 1998, Venice, Italy.
- Integer Programming and Combinatorial Optimization (IPCO), June 1998, Houston, TX.
- ACM-SIAM Symposium on Discrete Algorithms (SODA), January 1998, San Francisco, CA.
- ACM Symposium on Parallel Algorithms and Architectures (SPAA), June 1996, Padua, Italy.

COMPUTING
SKILLS

- **Programming Languages:** C++, C, Python, R, Java, iOS Programming, Pascal, FORTRAN, & Prolog.
- **Operating Systems:** Unix (Linux), Windows, & MacOS.
- **Software Packages:** MPI, PVM, OMNeT++, NS2, CPLEX, AMPL, Alice, Scratch, & Jeroo.

PROFESSIONAL
MEMBERSHIPS

IEEE (Senior Member) & ACM