

Dr. Rakesh M. Verma Curriculum Vitae

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Personal: **US Citizen**

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Highlights of Dr. Verma's CV

- **Distinguished Speaker** of the ACM, 2011-
 - **National Security Agency Center of Academic Excellence in Cyber Defense Research Certification** in 2015. **National Security Agency Center of Academic Excellence in Information Assurance Education Certification** in 2009
 - University of Houston 2013 **Lifetime Faculty Award for Mentoring Undergraduate Research**. Mentored **46** students in undergraduate research projects.
 - **Director**, Natural Science and Mathematics College (NSM) Center for Information Assurance Research and Education, December 2008-
 - **Director** of the ReDAS (Reasoning and Data Analytics for Security) Laboratory
 - **Three-time Chair of Faculty Search Committee**, six faculty were hired, three hirees already have tenure and one is a chaired professor
 - **Director of Undergraduate Studies** June 2000 – August 2002
 - **NSF Scholarships for Service Grant** featured on BioPortfolio, Phys.Org, Fox News Houston, Houston City and Press, Houston Got NewsWire, KFDM News Beaumont, Shoopr's Engineering New, Veozz, KUHF, and the Daily Cougar.
 - Published over **100** technical articles; Over **70** invited talks
 - Currently PI of **six** NSF and DoD grants, co-I of one NSF grant; PI or co-PI for over \$6.47 Million in total funds
 - Current research areas/focus topics: Cyber Security, Data Analytics and Formal Methods
 - Editor of four ACM workshop proceedings, Co-editor of three other workshop proceedings including one IEEE workshop.
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Education

Year	Degree	Institute/University, City
1989	PhD Computer Science	State University of New York (SUNY), Stony Brook
1985	MS Computer Science	SUNY, Stony Brook
1984	B.Tech. Electronics and Comm. Engg.	Indian Institute of Technology, Varanasi

Professional Experience

- Director, Natural Science and Mathematics College (NSM) Center for Information Assurance Research and Education December 2008-
- Professor of Computer Science September 2004 – present
 - Established the Secure Protocols and Systems Laboratory
 - Established the Center for Information Assurance Research and Education
- Associate Professor of Computer Science September 1995 – August 2004
University of Houston (Sabbatical leave: September 1996 – June 1997)
- Director of Undergraduate Studies June 2000 – August 2002
Computer Science Dept., University of Houston
Besides advising undergraduate students, handling admissions and petitions, I represented the department at the Cougar Preview in Fall 2000, Spring 2001, Fall 2001 and Spring 2002, and at the University of Houston Honors College Reception in Fall 2000, Spring 2001, Fall 2001, and Spring 2002.
- Visiting Professor July 2001
Center for Research in Informatics (CRIN) Nancy and French National Institute for Research on Informatics and Applied Mathematics (INRIA) Lorraine, France
- Visiting Professor July – August 1999, June 2000
SUNY at Stony Brook
- Scientific Consultant and Visiting Professor September 1996 – June 1997
CRIN Nancy and INRIA Lorraine, France
- Visiting Professor June – July 1995
CRIN Nancy and INRIA Lorraine, France
- Assistant Professor of Computer Science August 1989 – August 1995
University of Houston (Leave of Absence: Spring 1992)

Awards and Honors (reverse chronological order)

Year	Award/Honor
2016	Best Paper Award - 1st place <i>17th Int'l Conf. on Intelligent Text Processing and Comp. Ling. (CICLING)</i>
2015-21	National Security Agency and Dept. of Homeland Security Award Center of Academic Excellence in Cyber Defense Research to Univ. of Houston (UH)
2014-	Visiting Professor, Hubei University of Technology
2014	Finalist, University of Houston Innovation in Instructional Technology Award
2013	UH Lifetime Faculty Award for Mentoring Undergraduate Research Awarded to only member of the faculty per year for career achievement
2011	CougarPitch Award , Bauer College of Business, UH
2011-	Distinguished Speaker of the ACM
2009	National Security Agency and Dept. of Homeland Security Award Center of Academic Excellence in Info. Assurance Education to UH Computer Science Dept. Lead and co-lead on UH's proposal
2001	INRIA (France) Fellowship
2000	SUNY at Stony Brook Fellowship
1999	SUNY at Stony Brook Fellowship
1996-97	Visiting Professor on INRIA (France) Fellowship
1995	INRIA (France) Fellowship
1994	Topped the Computer Science teaching evaluations at UH for Fall semester
1990	NSF Research Initiation Award , (80 awards out of 442 proposals)
1988-89	Catacosinos Fellowship , SUNY at Stony Brook for outstanding contributions in Computer Science
1984	Prince of Wales Gold Medal for First position overall in the Electronics and Comm. Engg. graduating class
1980-84	Indian Institute of Technology (Varanasi) Merit Scholarship for outstanding academic performance
1981	2nd rank in 2nd Year B.Tech. class (> 300 students), Indian Institute of Technology, Varanasi

Current Research Interests

- Artificial Intelligence, Logic in Computer Science, Programming Languages: Formal methods and reasoning techniques with application to programming and protocol verification
- Text, Big Data and Data Analytics: data and text mining; natural language processing for document understanding and security applications
- Computer Security: design and verification of cryptographic protocols; Wireless Sensor Network security; phishing; security of big data frameworks

Selected External Invited Talks (last 5 years)

- "Natural Language Processing: Summarization and Question Answering," Austin Peay State University, March 1, 2013
- "Security: Protocols, Wireless Sensor Networks and Phishing," at Tula Institute, Dehradun, India, invited by BTKIT, Dwarahat, India, August 20, 2013

- “Enriching Security Courses with Data Analytics,” Association of Computing Educators in Texas, October 2013
- “Natural Language Processing: Summarization, Question Answering, Phishing Detection,” Keynote Speech at the International Conference on Advances in Computing & Communication Engineering (ICACCE-14), BTKIT, India, February 22 2014
- “Wireless Sensor Networks: Protocols and Analysis,” CREST Seminar, Texas Southern University, March 27, 2014
- “Automatic Phishing Email Detection the Natural Language Way,” Hubei University of Technology, June 10, 2014
- “Computer Science Education at the University of Houston,” Hubei University of Technology, June 11, 2014
- “Automatic Phishing Email Detection the Natural Language Way,” Hubei University of Economics, June 13, 2014.
- “Automatic Phishing Email Detection the Natural Language Way,” Information Engineering Institute, Chinese Academy of Sciences, June 16, 2014.
- “Computer Science Education at the University of Houston,” Kathmandu University, Nepal, December 7, 2014.
- “Current Research Trends in Phishing and ReMiND Laboratory,” Kathmandu University, Nepal, December 7, 2014.
- “Computer Science Education at the University of Houston,” Institute of Engineering (IOE) - Pulchowk, Tribhuvan University, Nepal, December 8, 2014.
- “Current Research Trends in Phishing and ReMiND Laboratory,” Institute of Engineering (IOE) - Pulchowk, Tribhuvan University, Nepal, December 8, 2014.
- “Computer Science Education at the University of Houston,” Nepal College of Engineering, Nepal, December 9, 2014.
- “Current Research Trends in Phishing and ReMiND Laboratory,” Nepal College of Engineering, Nepal, December 9, 2014.
- “Phish Or Not is The Question,” Syracuse University, April 6, 2015.
- “Wireless Sensor Networks: Security and Protocols,” IIIT Bangalore, September 14, 2015.
- “Automatic Phishing Email, Web Site and URL Detection,” National Center for Scientific Research - Demokritos, Athens, Greece, April 8, 2016.
- “Security Analytics: The New Frontier in Cyber Security?” ACM Distinguished Lecture, ACM Professional Chapter @ Sacramento, 15 April 2016
- “UHCS Research” and “Research in the ReDAS Laboratory,” Samsung Research Group at MSC America-Dallas, May 26, 2016
- “Security Analytics: The New Frontier in Cyber Security?” ACM Distinguished Lecture, New Mexico Institute of Mining and Technology, 9 September 2016

- “Understanding Disaster Preparedness and Recovery: A Case Study from Nepal Earthquakes of 2015,” with B. Bal, O. Gnawali and J. Vardeman-Winter, Keynote Presentation at ASNE 2016 Conference, Houston, Sept. 10, 2016.
- “Phish or Not is the Question,” College of Science and Engineering Colloquium, University of Houston Clear Lake, Nov. 2, 2016
- “Phishing Detection: Emails, Web and URLs,” Comfort Systems, 9 November 2016
- “Security Analytics: The New Frontier in Cyber Security?” IIT Madras, 13 April 2017
- “An Introduction to Security Analytics,” ACM India Summer School for Women on Information Security and Forensics, Pune, India, 31 May 2017
- “Phishing or Not is the Question,” ACM India Summer School for Women on Information Security and Forensics, Pune, India, 1 June 2017
- “Security Analytics: The New Frontier in Cyber Security?” PSG College of Technology, Plenary Talk at ICC-3, December 2017
- “Security Analytics: The New Frontier in Cyber Security?” University of Monterrey, Monterrey, Mexico, Plenary Talk, February 23, 2018
- “A General Model for Summarization and Its Implications,” Mid-South Theory Day, Houston, 31 March 2018.

Summary of External Grants

- Over 20 Research grants funded by National Science Foundation, National Security Agency, Department of Defense and companies.

Patent(s)

- Natural Language Approaches to Phishing Email Detection, Provisional Patent Filing by University of Houston, August 2012
- Automated Phishing Email Detection Based on Natural Language Processing techniques, USPTO, filed October 2013, pending.

Publications

Editorial Responsibilities, Book Chapters, Magazine Articles (reverse chronological order)

- Editor, Proceedings of the 4th ACM International Workshop on Security and Privacy Analytics (IWSPA 2018), Published by ACM, March 2018.
- “INSuRE: Collaborating Centers of Academic Excellence Engage Students in Cybersecurity Research,” with A. Sherman, M. Dark, A. Chan, R. Chong, T. Morris, L. Oliva, J. Springer, B. Thuraisingham, C. Vatcher, S. Wetzel, *IEEE Security and Privacy*, Aug. 2017, pp. 72-78.
- Editor, Proceedings of the 3rd ACM International Workshop on Security and Privacy Analytics (IWSPA 2017), Published by ACM, March 2017.

- “Defoe’s Contribution to Robert Drury’s Journal: A Stylometric Analysis,” with I. Rothman, T. Woodell, Jr. and B. Whitaker, Book Chapter in *An Expanding Universe*, Borck Festschrift, AMS Press Inc., New York, Feb. 2017.
- Editor, Proceedings of the 2nd ACM International Workshop on Security and Privacy Analytics (IWSPA 2016), Published by ACM, March 2016.
- “Security Analytics: Essential Data Analytics Knowledge for Cyber Security Professionals and Students,” with M. Kantarcioglu, D. Marchette, E. Leiss and T. Solorio, *IEEE Security and Privacy*, Nov/Dec 2015, pp. 60-65.
- Editor, Proceedings of the ACM International Workshop on Security and Privacy Analytics (IWSPA 2015), Published by ACM, March 2015.
- Co-editor, Proceedings of the IEEE International Workshop on Security of Mobile, Wireless, and Sensor Networks (MWSN 2013), Published by IEEE, September 2013
- “The UH Data Mining Hypertext Book,” available through my web page on Data Mining, 2010-
- Co-editor, Proceedings of the International Workshop of Unification, 2002.
- Co-editor, Proceedings of the 2nd ACM SIGPLAN International Workshop on Rule Based Programming (RULE-01), Electronic Notes in Theoretical Computer Science Series, volume 59, number 4, October 2001.

Selected Refereed Journal Publications (reverse chronological order) - last five years; complete list is at [Google Scholar page](#)

- “Citance-based Retrieval and Summarization Using IR and Machine Learning” with S. Karimi, L. DeMoraes, A.Das, *Scientometrics*, accepted for publication.
- “The Embodied Nature of Narrative Knowledge: A Cross-Study Analysis of Embodied Knowledge in Teaching, Learning, and Life,” with C. Craig, J. You, Y. Zou, D. Stokes, P. Evans, G. Curtis, *Teaching and Teacher Education*, 71, Jan. 2018, pp. 329-340.
- “The Influence of Parents on Undergraduate and Graduate Students’ Entering the STEM Disciplines and Careers,” with C. Craig, D. Stokes, P. Evans and B. Abrol, accepted for International Journal of Science Education, January 2018
- “Extractive Summarization: Limits, Compression, Generalized Model and Heuristics,” with D. Lee, *Computacion y Sistemas* (CICLING 2017 special issue), Vol. 21, No. 4, 2017 pp. 787-798
- “Identifying Reference Spans: Topic Modeling and Word Embeddings Help IR,” with L. DeMoraes, S. Baki and D. Lee, *International Journal on Digital Libraries (IJDL)*, Jun 2017.
- “Uniqueness of Normal Forms for Shallow Term Rewrite Systems,” with N. Radcliffe and L. DeMoraes, *ACM Transactions on Computational Logic*, Vol. 18, No. 2, June 2017, pp. 17:1-17:20.
- “The Efficacy of Epidemic Algorithms on Detecting Node Replicas in Wireless Sensor Networks,” with N. Shashidhar and C. Kari, *Journal of Sensor and Actuator Networks*, Vol. 4, No. 4, December 2015, pp. 378-409.

Selected Refereed Conference Publications (reverse chronological order) - last five years

- “Extractive Summarization: Limits, Compression, Generalized Model and Heuristics,” with D. Lee, accepted for poster presentation (and special issue of journal) at *18th International Conference on Intelligent Text Processing and Computational Linguistics (CICLING 2017)*, April 2017.
- “Scaling and Effectiveness of Email Masquerade Attacks: Exploiting Natural Language Generation,” with S. Baki, A. Mukherjee and O. Gnawali, full paper at the *12th ACM ASIA Computer and Communication Security (ASIACCS 2017)*, April 2017, pp 469-482.
- “Mining the Web for Collocations: IR Models of Term Associations,” with V. Vuppuluri, A. Nguyen, A. Mukherjee, G. Mammar, S. Baki and R. Armstrong , Oral presentation and full paper in *17th International Conference on Intelligent Text Processing and Computational Linguistics (CICLING 2016)*, April 2016, (**Best paper award - first place**).
- “Topic Based Segmentation of Classroom Videos,” with T. Tuna, M. Joshi, V. Varghese, R. Deshpande and J. Subhlok, *Proc. 45th IEEE Frontiers in Education Conference (FIE)*, October 2015.
- “An Unsupervised Approach for Idiom Identification Using Meanings” with V. Vuppuluri, *Proc. Recent Advances in Natural Language Processing (RANLP)*, September 2015.
- “Phish-IDetector: Message-Id Based Automatic Phishing Email Detection,” with N. Rai, *Proc. 12th International Conference on Security and Cryptography (SECRYPT)*, July 2015.
- “Integrity Protection for Big Data Processing with Dynamic Redundancy Computation,” with Z. Gao, N. Desalvo, P.D. Khoa, S.H. Kim, L. Xu, W. Shi and Won Woo Ro, *Proc. 12th IEEE International Conference on Autonomic Computing (ICAC)*, July 2015.
- “On the Character of Phishing URLs: Accurate and Robust Statistical Learning Classifiers,” with K. Dyer, *full paper, Proc. of 5th ACM Conf. on Data and Application Security and Privacy (CODASPY)* March 2015, pp 111-121.
- “Catching Classical and Hijack-based Phishing Attacks,” with T. Thakur, *Proc. 10th International Conference on Information Systems Security (ICISS 2014)*, December 2014.
- “Semantic Feature Selection for Text Data with Application to Automatic Phishing Email Detection,” with N. Hossain, *Proc. 16th International Conference on Information Security and Cryptology (ICISC)*, Lecture Notes in Computer Science, vol. 8565, October 2013, pp 455-468
- “Detecting Phishing Emails the Natural Language Way,” with N. Shashidhar and N. Hossain, *Proc. 17th European Symposium on Research in Computer Security (ESORICS 2012)*, September 2012.
- “Two-Pronged Phish Snagging,” with N. Shashidhar and N. Hossain, *Proc. 7th IEEE Availability, Reliability and Security Symposium (ARES 2012)*, August 2012.
- “Combining Syntax and Semantics for Automatic Extractive Single-document Summarization,” with A. Barrera, *13th International Conference on Intelligent Text Processing and Computational Linguistics (CICLING 2012)*, March 2012.
- Also, papers in top conferences such as IJCAI, IEEE FOCS, ICALP, STACS, etc. Complete list at: <https://scholar.google.com/citations?user=va3J0tYAAAAJ&hl=en&oi=ao>

Software

- **LRR:** A laboratory for equational programming and theorem proving, is under development and includes Smaran as a component

- **Smaran:** A tabling interpreter for equational programs, based on the congruence closure approach, has been implemented in C under Unix

Visiting Scientists

- Dr. Yala Tong, Hubei University of Technology, China, January 2013-June 2013
- Prof. Sandeep Sen, Indian Institute of Technology, Delhi, July 2-8, 2017

Dissertations/Theses Supervision - currently advising five PhD students

- Ph.D. dissertations:
 - S. Behl, “Declustering and Indexing Techniques for Temporal Databases and Information Retrieval”, S. Behl, graduated Fall 2002.
 - Ms. S. Hwang, “Topics in Formal Verification and Theorem Proving,” ABD.
 - Z. Liang, “On Formal Methods for Checking Cryptographic Protocols,” graduated Fall 2008.
- 21 M.S. theses advised (currently advising 2 MS students)
- Mentored 46 B.S. students on research projects (currently mentoring 3 BS students)

Selected New Course/Curriculum Development

- Security Analytics (undergrad), Approved as regular course, Fall 2017
- Security Analytics (graduate), Approved as regular course, 2016
- Natural Language Processing, Approved Spring 2014, New course on Advanced Topics in Natural Language Processing was approved.
- Security Analytics, Proposed Spring 2014, New course on Machine Learning, Data Mining, Statistics and Natural Language Processing Techniques for Computer Security
- New course on Data Mining, Fall 2009.
- New course on Computer and Network Security offered in Spring 2008 and Spring 2009.
- (Fall 03) Developing website for COSC 3340: Introduction to Theory of Computation (a UH first to my knowledge) and slides that include animations of the course concepts.

Selected Courses Taught

- Security Analytics (2015-2018)
- Algorithms and Data Structures (2015-2018)
- Computer and network Security (2008-2014)
- Information Retrieval (2002-2004)
- Natural Language Processing for Security and Biomedicine (2012)

- Data Mining (2008-2010)

Professional Activities

1. Proposals, Conferences and Panels

- Member, Technical Program Committee, of Rewriting Techniques and Applications (RTA) 2000, RTA 2005, Parallel and Distributed Computing Systems Conference (PDCS) 2008-2010 and 2012, International Conference on Information and Systems Security 2010, Colloquium for Information Systems Security Education 2011-2012, International Conference on Information Systems Security and Privacy 2015-2019, International Symposium on Foundations & Practice of Security 2017, ACL 2018, IEEE IRI 2018, DMD 2018.
- Co-chair, Technical Program Committee and Co-organizer, 2nd Annual International ACM SIGPLAN Workshop on Rule based Programming (RULE-01), International Workshop on Unification (Unif 2002), IEEE MWSN 2013.
- Panel Moderator, “Automata Theory - Its Relevance to Computer Science Students and Course Contents,” at the ACM SIGCSE 2006 Technical Symposium on Computer Science Education, Houston, March 1–5, 2006.
- Invited to the NSF CCLI Showcase at the ACM SIGCSE 2006 Technical Symposium on Computer Science Education, Houston, March 1–5, 2006.
- Co-organizer with Michal Armoni, BOF Session on Theory of Computation, ACM SIGCSE 2007 Technical Symposium on Computer Science Education, March 7-10, 2007.
- NSF Panels: 2008, 2012, two panels in 2014, 2015.
- Tutorials Co-chair, International Conference on Information and Systems Security, 2010.
- Invited to the NSF CCLI Showcase at the ACM SIGCSE 2012 Technical Symposium on Computer Science Education, Houston, March 2012.
- Invited Member, External Advisory Committee for the 5-year Texas Southern University \$5 Million NSF-supported CREST Center, June 2011-2016
- Invited to NSF Special Session at the CCLI/TUES PI Meeting, Jan. 2013.
- Chief Guest and Keynote Speaker, International Conference on Advances in Computing & Communication Engineering (ICACCE-14), Held at BTKIT, India, Feb. 2014.
- Member, FBI Infragard Houston Chapter, 2014-
- Poster presenter, SATC PI meeting, Washington DC, Jan 2015.
- Chair, Technical Program Committee, ACM International Workshop on Security and Privacy Analytics (IWSPA 2015), March 4, 2015.
- Invited Judge, Nunan Research Day: Cyber, Wireless and Big Data, Syracuse University, Engineering & Computer Science College, April 6, 2015.
- Research Subgroup Lead, Phishing Task Force, FBI Infragard, September 2015-
- General Chair and Co-Chair, Technical Program Committee, 2nd ACM International Workshop on Security and Privacy Analytics (IWSPA) 2016-2018.
- Member, Technical Program Committee, International Cross Domain Conference and Workshop (CD-ARES 2016), Salzburg, Austria, Colocated with ARES 2016.
- Member, Technical Program Committee, 1st International Workshop on Malware Analysis (MALWARE 2016), Colocated with ARES 2016.

- Invited Panelist, “Mentorship of Women in Computer Security,” ASE@USENIX 2016, August 2016
- Invited Speaker, “Teaching Data-Driven Security: A Course on Security Analytics, Lightning Talk at ASE@USENIX 2016, August 2016
- Proposal Reviewer, Israel Science Foundation, 2017
- Plenary Speaker, 3rd International Conference on Computational Intelligence, Cyber Security & Computational Models (ICC3), December 2017
- Chair of Organizing Committee, 1st Anti Phishing Pilot at 4th ACM IWSPA 2018, March 2018
- Review Editor Cybersecurity and Privacy, Frontiers in Big Data, May 2018-

2. Reviewer for:

- American Mathematical Reviews, Communications of the ACM, Journal of the ACM, ACM Transactions on Computational Logic, SIAM Journal on Discrete Mathematics, Journal of the American Society for Information Science and Technology, Scientometrics Journal, IEEE Access, IEEE Trans. on Dependable and Secure Computing, Computers and Security Journal, etc.
- Conference Reviewing: Reviewer for several conferences including: Foundations of Software Technology and Theoretical Computer Science (FST-TCS), IEEE Symposium on Logic in Computer Science (LICS), International Conference on Parallel Processing (ICPP), International Conference on Cooperative Information Systems, FSCD, International Conference on Rewriting Techniques and Applications (RTA), International Conference on Information and Knowledge Management (CIKM), International Conference on Mathematical Foundations of Computer Science (MFCS), International Colloquium on Automata Languages and Programming (ICALP), International Conference on Automated Deduction (CADE), Logic Programming and Automated Reasoning (LPAR), Conference on Algebraic Informatics (CAI), etc.

Summary of Service to Community and K-12 Education

- Judge, Houston Science and Engineering Fair, since 2006-
- Judge, Texas State Science and Engineering Fair, 2007.
- Assistant Coach for Mathcounts and Texas Math. and Science Coaches Association (TMSCA) at First Colony and Fort Settlement Middle Schools since 2005-2010

Summary of Service to Department, College and University

- Served as member and chair of several department committees: Faculty Search, Undergraduate Committee, Graduate Committee and Executive Committee
- Department Newsletter Editor since 2016
- Served as member of several College committees
- Served on University Faculty Senate for two years