

BIOGRAPHICAL SKETCH

SUDHIR AGGARWAL

CONTACT

Department of Computer Science, Florida State University, Tallahassee, FL 32306-4530

PROFESSIONAL PREPARATION

Stanford University	Mathematics	B.S.
University of Michigan	Mathematics	M.S.
University of Michigan	Computer & Comm. Sciences	M.S.
University of Michigan	Computer & Comm. Sciences	Ph.D.

SELECTED APPOINTMENTS

Aug. 2002 – present	Professor, Dept. of Computer Science, Florida State University
Aug. 2002 – Aug. 2005	Professor & Chair, Dept. of Computer Science, Florida State University
June 1999 – Aug. 2002	Director / (CTO, iCDD), Bell Laboratories / Lucent Technologies
Aug. 1990 – June 1999	Professor & Chair, Dept. of Computer Science, SUNY Binghamton
June 1993 – June 1998	Director, Center for Computing Technologies, SUNY Binghamton
June 1989 – Apr. 1990	VP for Software, Information Machines (startup)
June 1987 – June 1989	District Manager, Dist. Sys. Soft. Res., Bell Communications Research
Mar. 1982 – June 1987	MTS, Mathematical Sciences Research Center, AT&T Bell Laboratories
Sep. 1977 – Mar. 1982	Assist. & Assoc. Prof., Dept. of Math., Univ. of California, Riverside

SELECTED PUBLICATIONS

1. Hutchinson, S.; Mirza, M.M.; West, N.; Karabiyik, U.; Rogers, M.K.; Mukherjee, T.; Aggarwal, S.; Chung, H.; Pettus-Davis, C. Investigating Wearable Fitness Applications: Data Privacy and Digital Forensics Analysis on Android. *Appl. Sci.* **2022**, *12*, 9747. <https://doi.org/10.3390/app12199747>.
2. Gokila Dorai, Sudhir Aggarwal, Neet Patel, Charisa Powell, VIDE - Vault App Identification and Extraction System for iOS Devices, *Forensic Science International: Digital Investigation*, Volume 33, Supplement, **2020**, 301007, ISSN 2666-2817.
3. S. Aggarwal, S. Houshmand, T. Mukherjee and J. Parsons, “An Empirical Study on Efficiency of a Dictionary Based Viterbi Algorithm for Word Segmentation,” *2020 IEEE Int. Conference on Big Data (Big Data)*, **2020**, pp. 3702-3710.
4. Gokila Dorai, Shiva Houshmand, Sudhir Aggarwal, (2020), “Data Extraction and Forensic Analysis for Smartphone Paired Wearables and IoT Devices,” *Proceeding of the 53rd Hawaii International Conference on System Sciences (HICSS)*, pp. 1401-1409.
5. S. Aggarwal, G. Dorai, U. Karabiyik, T. Mukherjee, N. Guerra, M. Hernandez, J. Parsons, K. Rathi, H. Chi, T. Aderibigbe, R. Wilson, “Design and Implementation of a Targeted Data Extraction System for Mobile Devices,” *Proceedings 15th IFIP WG11.9 Int. Conf. on Digital Forensics*, Jan 2019.
6. Aggarwal S., Houshmand S., Weir M. (2018) “New Technologies in Password Cracking Techniques.” In: *Lehto M., Neittaanmäki P. (eds) Cyber Security: Power and Technology. Intelligent Systems, Control and Automation: Science and Engineering*, vol 93. Springer, Cham.
7. Houshmand S., Aggarwal S. (2017) “Using Personal Information in Targeted Grammar-Based Probabilistic Password Attacks.” In: *Peterson G., Sheno S. (eds) Advances in Digital Forensics XIII*. IFIP Advances in Information and Communication Technology, Vol. 511. Springer, Cham.

8. Karabiyik, Umit, and Sudhir Aggarwal. "Model of hierarchical disk investigation." In *2016 4th International Symposium on Digital Forensic and Security (ISDFS)*, pp. 84-88. IEEE, 2016.
9. Umit Karabiyik and Sudhir Aggarwal, "Advanced Automated Disk Investigation Toolkit," *Advances in Digital Forensics XII*, G. Peterson and S. Sheno (eds.), Springer International Publishing, 2016, 379-396.
10. Shiva Houshmand, Sudhir Aggarwal, Umit Karabiyik, "Identifying Passwords Stored on Disk," *Advances in Digital Forensics XI*, G. Peterson and S. Sheno (eds.), Springer International Publishing, 2015, 195-213.
11. Houshmand, S.; Aggarwal, S.; Flood, R., "Next Gen PCFG Password Cracking," *Information Forensics and Security, IEEE Transactions on*, vol.10, no.8, pp.1776-1791, Aug. 2015.
12. Umit Karabiyik and Sudhir Aggarwal, "AUDIT: Automated Disk Investigation Toolkit," *Journal of Digital Forensics, Security and Law*, Vol. 9-2, 2014, pp. 129-144.
13. Shiva Houshmand and Sudhir Aggarwal, "Building Better Passwords using Probabilistic Techniques," *Proceedings of the 28th Annual Computer Security Applications Conference (ACSAC '12)*, December 2012, pp. 109-118.
14. Matt Weir, Sudhir Aggarwal, Michael Collins, Henry Stern, "Testing Metrics for Password Creation Policies by Attacking Large Sets of Revealed Passwords," *Proceedings of CCS'10*, October 4-8, 2010, pp. 163-175.
15. Sudhir Aggarwal, Zhenhai Duan, Faye Jones and Wayne Liu, "Trust-Based Internet Accountability: Requirements and Legal Ramifications," *Journal of Internet Law*, Vol. 13-10, April 2010, pp. 3-15.
16. Wayne Liu, Sudhir Aggarwal and Zhenhai Duan, "Incorporating Accountability into Internet Email," *Journal of Digital Forensic Practice*, Vol. 2-4 (2009), pp. 209-220.
17. Matt Weir, Sudhir Aggarwal, Breno de Medeiros, Bill Glodek, "Password Cracking Using Probabilistic Context Free Grammars," *2009 IEEE Symposium on Security and Privacy*, May 2009, pp. 391-405.
18. Sudhir Aggarwal, Jasbinder Bali, Zhenhai Duan, Leo Kermes, Wayne Liu, Shashank Sahai, and Zhenghui Zhu, "The Design and Development of an Undercover Multipurpose Anti-Spoofing Kit (UnMask)," *Proceedings of the 23rd Computer Security Applications Conference (ACSAC)*, December 2007, pp. 141-150.
19. Sudhir Aggarwal, Justin Christofoli, Sarit Mukherjee and Sampath Rangarajan, "Authority Assignment in Distributed Multi-Player Proxy-based Games," *Proceedings of the 5th Workshop on Network & System Support for Games 2006*, October, 2006.
20. Sudhir Aggarwal, Michael Burmester, Peter Henry, Leo Kermes, Judie Muholland, "Anti-Cyberstalking: The Predator and Prey Alert (PAPA) System," *Proceedings of the 1st Int. Workshop on Systematic Approaches to Digital Forensics Engineering (SADFE 2005)*, November 2005, pp. 195-205.
21. Sudhir Aggarwal, Hemant Banavar, Sarit Mukherjee and Sampath Rangarajan, "Fairness in Dead-Reckoning Based Distributed Multi-Player Games," *ACM SIGCOMM 2005 Workshop on NetGames*, October 2005, (on-line proceedings).
22. Sudhir Aggarwal, Madhura Limaye, Arun Netravali, and Krishan Sabnani, "Constrained Diameter Steiner Trees for Multicast Conferences in Overlay Networks," *Proceedings of the 1st Int. Conf. on Quality of Service in Heterogeneous Wired/Wireless Networks, (QShine 2004)*, October 2004, pp. 262-271.
23. Sudhir Aggarwal, Hemant Banavar, Amit Khandelwal, Sarit Mukherjee and Sampath Rangarajan, "Accuracy in Dead-Reckoning Based Distributed Multi-Player Games," *ACM SIGCOMM 2004 Workshop on NetGames*, August 2004, pp. 161-165.
24. Sandeep Mitra and Sudhir Aggarwal, "Infrastructure for the Synchronization and Coordination of Concurrent Java Component Programs," *Proceedings of the 33rd Hawaii International Conference on System Sciences (HICSS 33)*, January 2000, cd-rom.

25. S. Aggarwal, S. Paul, D. Massey and D. Calderaru, "A Flexible Multicast Routing Protocol for Group Communication," *Computer Networks, Volume 32, Issue 1*, January 2000, pp. 35-60
26. K. Ghose, S. Aggarwal, A. Ghosh, D. Goldman, P. Sulatycke, P. Vasek, and D. Vogel "Designing Multiprocessor/Distributed Real-Time Systems Using the ASSERTS Toolkit," *Euro-Par Conference (in Lecture Notes in Computer Science, Vol.1685)*, August 1999, pp. 505-510.
27. Sudhir Aggarwal, Fuyung Hung and Weiyi Meng, "WIRE - A WWW-based Information Retrieval and Extraction System," *Proceedings of the 9th Int. Workshop. on Database and Expert Systems Applications (DEXA98)*, August 1998, pp. 887-892.
28. K. Ghose, S. Aggarwal, P. Vasek, S. Chandra, A. Raghav, A. Ghosh, and D. Vogel, "ASSERTS: A Toolkit for Real-time Software Design, Development and Evaluation," *9th EuroMicro Workshop on Real-Time Systems*, June 1997, pp. 224-232.
29. Beth Schroeder, Karsten Schwan and Sudhir Aggarwal, "Software Approach to Hazard Detection Using On-line Analysis of Safety Constraints," *Proceedings of the 16th Symposium on Reliable Distributed Systems*, Oct. 1997, pp. 80-87.
30. Sudhir Aggarwal and Sanjoy Paul, "A Flexible Protocol Architecture for Multi-party Conferencing," *Fifth Int. Conf. on Computer Communication Networks*, Oct. 1996, pp. 81-91.
31. Barry Kelly and Sudhir Aggarwal, "A Framework for a Fidelity Based Agent Architecture for Distributed Interactive Simulation," *Proceedings of the 14th Workshop on Standards for Distributed Interactive Simulation*, March 1996, pp. 541-546.
32. Sudhir Aggarwal and Amritansh Raghav, "Dualcast: A Scheme for Reliable Multicasting," *Proceeding of the 1994 Int. Conf. on Network Protocols*, Oct. 1994, pp. 15-22.
33. Sudhir Aggarwal and Chakib Chraïbi "On the Scheduling of Hyperperiodic Tasks," *Proceedings of the 5th EuroMicro Workshop on Real-Time Systems*, June 1993, pp. 112-117.
34. Sudhir Aggarwal and Patricia Obenour, "Specifying a Switching System using IC*" *Proceedings of IEEE INFOCOM '90*, August 1990.
35. S. Aggarwal, C. Courcoubetis and P. Wolper, "Adding Liveness Properties to Coupled Finite State Machines," *ACM Trans. on Programming Languages and Systems, Vol. 12-2*, April 1990, pp. 303-339.
36. S. Aggarwal, D. Barbara, W. Cunto, and M.R. Garey, "The Complexity of Collapsing Reachability Graphs," in *Lecture Notes in Computer Science, J. Sifakis (ed), Proceedings of the Workshop on Automatic Verification Methods for Finite State Systems*, Grenoble, France, 1989, pp. 269-274.
37. Sudhir Aggarwal and Zvi Har'El, "Simulation Analysis of Protocols in an Integrated Software Environment," *Computer Networks & ISDN Systems, Vol. 16-3*, January 1989, pp. 197-215.
38. S. Aggarwal, D. Barbara and K.Z. Meth, "A Software Environment for the Specification and Analysis of Problems of Coordination and Concurrency," *IEEE Trans. on Software Engineering, Vol. 14-3*, March, 1988, pp. 280-290.
39. S. Aggarwal, D. Barbara and K.Z. Meth, "SPANNER: A Tool for the Specification, Analysis, and Evaluation of Protocols," *IEEE Trans. on Software Engineering, Vol. 13-12*, December, 1987, pp. 1218-1237.
40. Sudhir Aggarwal and Robert P. Kurshan, "Modeling Elapsed Time in Protocol Specification," in *Protocol Specification, Testing and Verification III*, ed. H. Rudin and C.H. West, North-Holland, 1983.
41. S. Aggarwal, R.P. Kurshan and K.K. Sabnani, "A Calculus for Protocol Specification and Validation," in *Protocol Specification, Testing and Verification III*, eds. H. Rudin and C.H. West, North-Holland, 1983.
42. Sudhir Aggarwal, "Deterministic Representation of Probabilistic Systems by Ergodic Machines," *Mathematical Systems Theory 10-4*, 1977.

SELECTED SYNERGISTIC ACTIVITIES

- **External Grant Funding since joining FSU in 2002 as Department Chair:**
 - *Research Grants as PI: 4.78+ Million; as Co-PI: 1.29+ Million.*
 - *Scholarship for Services Grant as Co-PI: 1.85+ Million.*
- **External Grant Funding at SUNY-Binghamton (1990 – 1999)**
 - *Research Grants as PI: 1.56+ Million.*
- Directing the Electronic Crime Investigative Technologies (ECIT) Laboratory, (2007 – present). ECIT has worked with the Florida Department of Law Enforcement & the National White Collar Crime Center, in the areas of cybersecurity, cybercrime and digital forensics.
- “*Password Cracking Using Probabilistic Context-Free Grammars,*” by Matt Weir, Sudhir Aggarwal, Breno de Medeiros and Bill Glodek, published in the 2009 IEEE Symposium on Security & Privacy, was awarded a Test-of-Time Award at the 42nd S&P, (May 2021).
- Invited to teach a short course on “Password Cracking” at the 25th Jyväskylä Summer School, University of Jyväskylä, Finland (August 2015).
- Recent Invited Talks
 - *TDES*, Techno Security Digital Forensics Conference, Myrtle Beach, (June 2019)
 - *Modern Password Cracking Systems (workshop)*, DFRWS USA 2017 (August 2017)
 - *Password Cracking (short course)*, University of Jyväskylä, Finland (August 2015)
 - Invited speaker at *the Centre for Strategic Infocomm Technologies*, Govt. of Singapore, (November 2014).
 - Invited speaker at *the NW3C State of the States Cybercrime Consortium*, Potomac Maryland, (May 2012).
 - Gave several invited presentations on *Password Cracking and Cybersecurity* at Superlec - Rennes, France, April 18, 2011.
- ECIT conducted validation testing of a Microsoft product called Cofee (Computer Online Forensic Evidence Extractor) through a request from NW3C and Microsoft (2009)
- As chief technology officer (2000 –2002) of the internet content delivery and distribution (iCDD) business unit of Lucent Technologies, I was responsible for the architecture, portfolio, and design and development of the Imminet™ product line including intelligent 4/7 switches and caches (static, streaming, secure).
- General Co-chair of the *1998 International Conference on Network Protocols*, (1998).
- General and Program Co-chair for the *IFIP Eighth International Symposium on Protocol Specification, Testing and Verification*, (1988).
- At Bell Laboratories, designed and developed software tools for the specification and analysis of protocols. A prototype system (SPANNER) was used for research and led to the development of a commercial system.

SELECTED BOOKS, SPECIAL ISSUES & MISCELLANEOUS

- Matt Weir and Sudhir Aggarwal, “Cracking 400,000 passwords, or how to explain to your roommate why the power bill is so high,” Presentation at *DEFCON 17*, Las Vegas, Nevada, July 31 – August 2, 2009. (on conference cd-rom)
- Sudhir Aggarwal and Krishan Sabnani, (eds.) "Special Issue on OSI Protocols," *Computer Networks and ISDN Systems*, March, 1990.
- Sudhir Aggarwal and Bhaskarpillai Gopinath, (eds.) "Special Issue on Tools for Computer Communication Systems," *IEEE Transactions on Software Engineering Vol 14-3*, March, 1988.