

## R. Sekar

Professor of Computer Science

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### Employment **Professor:** (2006 – )

Department of Computer Science, Stony Brook University.

### **Associate Professor:** (2001 – 2006)

Department of Computer Science, Stony Brook University.

### **Assistant Professor:** (1999 – 2001)

Department of Computer Science, Stony Brook University.

### **Assistant Professor:** (1996 – 1999)

Department of Computer Science, Iowa State University, Ames, IA.

### **Research Scientist:** (1991 – 1996)

Computer Networking Research, Bellcore, Morristown, NJ.

### Education **Ph.D., Computer Science:** (1991)

State University of New York at Stony Brook.

### **Bachelor of Technology, Electrical Engineering:** (1986)

Indian Institute of Technology, Madras, India.

### Courses Taught **Graduate:** Algorithms, System Security, Network Security, Compiler Design, Programming Languages.

**Undergraduate:** Programming Languages, Compiler Design, Software Security, Network Security

**Seminar courses:** Computer security and intrusion detection, Computer-aided techniques for building reliable systems, Program analysis and software engineering.

### Curriculum Development • Developed specialization in *Information Assurance* at undergraduate and graduate levels. Stony Brook was designated by the National Security Agency (NSA) as a *Center of Excellence in Information Assurance Education* as a result of these efforts.

• Developed a laboratory for cybersecurity experiments, incorporating a novel virtual network testbed, with support from NSF.

• Developed several graduate and undergraduate courses, including:

- Network Security (CSE 508)
- Computer System Security (CSE 509)
- Advanced Computer Security (CSE 608),
- Network Security (CSE 408),
- Computer System Security (CSE 409),
- Software Security (CSE 360),
- Advanced Programming Languages (ComS 542, Iowa State University),
- Principles of Network Application Programming (ComS 587, Iowa State University).

**Honors and Distinctions**

- Runner-up for best paper, ACM SACMAT, 2014.
- Best paper award, USENIX Security Symposium, 2013.
- Chancellor's award for Excellence in Scholarship and Creative Activities, 2011.
- SUNY Research and Scholarship Award, 2006. (4 out of about 1700 faculty at Stony Brook University received this award in 2006.)
- Faculty Service award, Department of Computer Science, 2002-04. (One award made for the above two-year period.)
- Best paper award, Annual Computer Security Applications Conference (ACSAC), 2003.
- Promising Inventor Award, Research Foundation of SUNY, 2003.
- Research Excellence award, Department of Computer Science, 2000-02.(One award made for the above two-year period.)
- DoD Critical Infrastructure Protection and Information Assurance Fellows award, 2001.
- Catacasinos Fellowship for Excellence in Computer Science, Stony Brook, 1990.
- Distinction in the Ph.D. qualifying examination, first among 20 candidates, 1988.
- Siemens Prize for best student in Electrical Engineering (1982-86) at IIT, Madras.
- Best student award in Electrical Engineering, IIT, Madras, 1983-84, 84-85 and 85-86.

**Selected Invitations**

- Information Assurance Analysis Speaker Series, National Security Agency, 2017.
- Distinguished Lecture, Cyber Security Research & Education Institute, UT Dallas, 2017.
- Keynote Speaker, 25th IFIP Data and Applications Security and Privacy Conference (DBSec), July 2011.
- Keynote Speaker, International Conf. on Runtime Verification, Nov. 2010.
- Invited participant at DARPA ISAT Workshop on Black Clouds (Security issues in Cloud Computing Environment), 2010.
- Invited Speaker, TRUST Seminar, University of California, Berkeley, November 2008.
- Keynote Speaker, International Conf. on Information System Security, Dec. 2006.
- Invited Speaker, Information Trust Institute Seminar, University of Illinois at Urbana-Champaign, November 2006.
- Invited speaker at AFOSR Workshop on: Homogeneous Enclave Software vs Heterogeneous Enclave Software, 2007.
- Invited participant at the NSF/Treasury workshop on security for the finance industry, March 2005.
- Invited participant at DARPA Workshop on Application Communities, October 2004.
- Invited participant at CRA Grand Challenges in Information Security workshop, 2003.
- Invited participant at DARPA Workshop on Security Policy, 2000).
- Invited participant at DARPA Workshop on Intrusion Detection Evaluation, 2000.
- Invited participant at the first and second DARPA workshops on Management and Survivability of Large-Scale Networks, 1996.

**Professional Service**

- Associate editor, Journal of Computer Security (2014-)
- Associate editor, ACM Transaction on Internet Technology (2009-2015)
- Associate editor, IEEE Transactions on Information Forensics (2009-2014)
- Member, NSF CISE/CNS Committee of Visitors.
- Panel member for for NSF Cyber Trust, Expeditions, Distributed Systems, CAREER, SFS and other programs.
- Reviewer for Research Council of Norway, and MITACS, Canada.
- Program Chair, 4th International Conference on Information Systems Security, 2008. Also a program committee member 2005-11.
- Program Chair, ACM New Security Paradigms Workshop, 2003 and 2004.
- Co-chair, Workshop on abstractions for distributed multimedia, ACM/IEEE Multimedia Conference, Anaheim, California, 1993.

*Selected Program Committees*

- USENIX Security Conference, 2005, 2006, 2008–10, 2015.
- ISOC Network and Distributed Systems Security Conference, 2008–09, 2012.
- IEEE Security and Privacy Symposium, 2007–09, 2011-13.
- ACM Computer and Communications Security Conference, 2002, 2003, 2006, 2009, 2010.
- Annual Computer Security Applications Conference (ACSAC), 2010, 2011.
- ESORICS, 2011.
- Recent Advances in Intrusion Detection, 2008, 2009.
- Detection of Intrusions & Malware, and Vulnerability Assessment, 2007.
- Organized *Stony Brook Workshop on Information Assurance Education*, 2004.
- ACM New Security Paradigms Workshop, 2002.
- Practical Aspects of Declarative Languages, 2000.

**University Service**

- Graduate Admissions Chair (2001–): Organized and managed the admission process, evaluating over 3000 applications in the last year. Developed a web-based system to handle this volume of applications, and to streamline the evaluation process.
- Graduate committee (2003–present).
- Established the Center for Cybersecurity as a department level center (2001) and then as a College of Arts and Sciences Center (2004).
- SUNY Chancellor’s Cybersecurity Task Force (2002–04).
- Online graduate application project. This is a joint project between DoIT, Graduate School and CS department to develop a customized online application and evaluation system to handle graduate admissions for SBU (2003–2005).
- University Senate Computing and Communications Committee (2002–2009).
- Department Faculty recruiting committee (2001–2005, 2010).
- Center of Excellence in Wireless and IT (CEWIT) Steering Committee (2003–present).

**Research  
Supervision**

*Post-doctoral:*

Yow-Jian Lin (Telcordia Technologies)  
Daniel DuVarney (Reactive Systems, Inc.)  
Yves Younan (Cisco)

*Ph.D.:*

1995: C.R. Ramakrishnan (Co-advisor; Professor, Stony Brook University)  
2003: Prem Uppuluri (U. of Missouri, Kansas City)  
2003: Ajay Gupta  
2004: V.N. Venkatakrishnan (Professor, U. of Illinois, Chicago)  
2006: Zhenkai Liang (Associate Professor, National University of Singapore)  
2006: Sandeep Bhatkar (Symantec Research)  
2008: Weiqing Sun (Toledo University)  
2008: Lorenzo Cavallaro (Royal Holloway, University of London)  
2009: Wei Xu (VMWare)  
2009: Alok Tongaonkar (Director, Symantec)  
2015: Mingwei Zhang (Intel)  
2015: Niranjana Hasabnis (Intel)  
2016: Riccardo Pelizzi (Google)  
2016: Wai-Kit Sze (Renaissance Technologies)  
2017: Laszlo Szekeres (Google)  
2017: Qiao Rui (LinkedIn).

*Current:*

Md Nahid Hossain,  
Tung Tran,  
Junao Wang (as co-advisor)

*Prominent graduates that worked closely with Sekar but had a different Ph.D. advisor:*

Owen Kaser (University of New Brunswick, Canada)  
Abhik Roychoudhury (National University of Singapore)  
Dinankar Dhurjati (DoCoMo Labs)  
Samik Basu (Iowa State University)  
Diptikalyan Saha (IBM Research, India)  
Prateek Saxena (National University of Singapore)

*M.S.:*

1997: Guang Yang, Yong Cai  
1998: Ravi Vankamamidi  
1999: Pradeep Bollineni, Kapil Jain, Amrita Deshmukh, Prem Uppuluri  
2000: Tushar Shanbhag, Mugdha Bendre  
2001: Sheng Zhou, Xu Li, Gaurav Sehgal  
2002: Sofia Tsipa, Aashish Gupta, Henglin Yang, Shridhar Balu, Dinakar Dhurjhati  
2003: Abhishek Tiwari, Shabbir Dahodwala, Abhijith Das, Jay Dave,  
James Frullo, Peri Ram, Imran Jatoti, Seung Lee,  
Shruthy Murthy, Tianning Li, Tapan Kamat  
2004: Prateek Rana, Channa Mohan, Divya. Padmanabhan,  
Vishwas Nagaraja, Alok Tongaonkar  
2005: Abhishek Chaturvedi, Yogesh Chauhan, Joy Dutta, Krishna Kumar

**Research  
Supervision  
(Continued.)**

- 2006: Gaurav Poothia, Varun Katta, Sandhya Menon, Chetan Parampalli,  
Mahmoud Al-ayyoub, Mohammed Mehkri, Milan Manavat,  
Karthik Murthy, Jiacheng Chen
- 2007: Prateek Saxena, Rekha Dharanipragadha, Janani Natarajan,  
Mayur Mahajan, Pinkesh Zaveri, Manish Nair
- 2008: Munyaradzi Chiwara, Nirranjan Inamdar, Tejas Karandikar,  
Varun Puranik, Manuel Rivera
- 2009: Ravi Chintallapudi, Abhishek Dhamija, Amol Karmarkar,  
Sergey Kudria, Sreenaath Vasudevan
- 2010: Arvind Ayyangar, Abhiraj Butala, Anupama Chandwani,  
Prachi Deshmukh, Nirranjan Hasabnis, Mithun Iyer, Avanti Limaje,  
Bhuvan Mital, Ashish Misra, Srivani Narra, Arun Ponniah,  
Gaurav Naigoankar, Ganesh Sangle, Prakhar Sharma
- 2011: Kenzley Alphonse, Praveen Krishnamurthy, Manish Mehra, Sumati Priya
- 2012: Michael Corley, Alireza Saberi, Jeet Pratap Singh
- 2013: Zahed Khurasani, Yaroslav Markov, Nishant Suneja

*B.S.:*

Paul Talamo, Marc Gordon, Kenzley Alphonse, Jamal Irving,  
Eric Papenhausen, Michael Corley, Daniel Scanteianu, Ryan Webber

## Research Grants

1. Multi-layer Software Transformation for Attack Surface Reduction and Shielding, \$3,496,687, PIs: R. Sekar, Michalis Polychronakis and Long Lu  
*Office of Naval Research*, 2017–22.
2. MARPLE: Mitigating APT damage by Reasoning with Provenance in Large Enterprise networks, \$1,218,411, PIs: R. Sekar, Scott Stoller and Leman Akoglu,  
*Defense Advanced Research Projects Agency (DARPA)*, 2015–19.
3. Software Diversification for Attack Prevention and Forecasting, \$821,836, PIs: Michalis Polychronakis, Long Lu and R. Sekar,  
*Office of Naval Research*, 2015–18.
4. A platform for enhancing security of binary code, \$500,000, PI: R. Sekar, *National Science Foundation*, 2013–16.
5. Hardware, Languages, and Architectures for Defense Against Hostile Operating Systems, \$900,000, PI: R. Sekar, *Air Force Office of Scientific Research*, 2009-14. (Stony Brook’s share of a \$7.5M *DoD MURI* grant with 8 PIs from Berkeley, Harvard, SBU, UIUC and UVa.)
6. Proactive Techniques for Preserving System Integrity: A Basis for Robust Defense Against Malware, \$1,000,000, PIs: R. Sekar, Scott Stoller and C.R. Ramakrishnan, *National Science Foundation*, 2008-13.
7. An Extensible Software Platform for a Virtual Cyber Security Laboratory, \$191,000, PI: R. Sekar, *National Science Foundation*, 2008-10. (Stony Brook’s share of a \$500,000 grant with 4 PIs across two CUNY campuses, NYU/Polytechnic and SBU.)
8. A Framework for Analyzing and Ensuring Trust in Service-Oriented Architectures, \$2,085,412, PIs: Scott Stoller, R. Sekar and C.R. Ramakrishnan,  
*DoD Multi-Disciplinary University Research Initiative (MURI)* award, *Office of Naval Research*, 2007–13.
9. Center for Information Protection: A Multi-University Industry/University Collaborative research Center, \$250,000, PI: R. Sekar, co-PIs: Tzi-cker Chiueh, Rob Johnson, Radu Sion, Scott Stoller, and Erez Zadok.  
*National Science Foundation*, 2007–2012.
10. New Techniques for Attack Detection, Prevention and Immunization, \$350,056, PI: R. Sekar, *National Science Foundation*, 2006–10.
11. Cyber Security: Tools and Techniques for Fail-Safe Systems, \$202,188, PIs: R. Sekar, T. Chiueh, S. Stoller, C.R. Ramakrishnan, R. Sion and E. Zadok,  
*NYSTAR*, 2005–06.
12. Scholarship for Service in Information Assurance, \$2,459,061, PI: R. Sekar, Co-PIs: T. Chiueh, S. Stoller, I.V. Ramakrishnan, and E. Zadok,  
*National Science Foundation*, 2004–10.
13. Model-Carrying Code: A new Approach to Mobile-Code Security, \$1,548,926, PI: R. Sekar, Co-PIs: S. Smolka, C.R. Ramakrishnan, and I.V. Ramakrishnan,  
*Office of Naval Research*, 2001–06.
14. Model Checking for Detecting Computer System Vulnerabilities, \$925,000, PIs: C.R. Ramakrishnan, I.V. Ramakrishnan, R. Sekar, S. Smolka, and S. D. Stoller,  
*National Science Foundation*, Information Technology Research (ITR), 2002-2007.
15. A Plan for Developing an Industry/University Collaborative Research Center on Cyber Security, PI: R. Sekar, Co-PIs: T. Chiueh, R. Johnson, S. Stoller, C.R. Ramakrishnan, R. Sion and E. Zadok,  
\$10,000, *National Science Foundation*, 2005–06.

16. Capacity Expansion in Information Assurance, \$199,883, PI: R. Sekar, Co-PIs: S. Stoller, I.V. Ramakrishnan, and E. Zadok, *National Science Foundation*, 2003–06.
17. Secure Mobile Code Execution Environment, PI: R. Sekar, Co-PI: I.V. Ramakrishnan, \$352,519, *Computer Associates (includes a \$60K supplement from NYSTAR)*, 2003–06.
18. A New Approach for Securing Systems Using Adaptive Intrusion Response, PI: R. Sekar, \$290,000, *National Science Foundation, Trusted Computing division*, 2002-2007.
19. Cybersecurity Collaborating with Information Technology via CSL \$90,180, *Dolphin Technology Inc.*, 2003. PI: R. Sekar, Co-PIs: T. Chiueh, S. Stoller and E. Zadok
20. A Model-Based Approach for Securing Software Systems, PI: R. Sekar \$200,000, *National Science Foundation*, 2001–05.
21. Specification-Based Techniques in Information Assurance, PI: R. Sekar \$235,000, *Air Force Office of Scientific Research*, US DoD Critical Infrastructure Protection and Information Assurance Fellows program, 2001–02.
22. Protecting Resources Using Programmable Adaptive Rapid Reactors, PI: R. Sekar \$260,000, *Defense Advanced Research Projects Agency (DARPA)*, 2000–02.
23. Survivable Active Networks, PI: R. Sekar \$446,000, *Defense Advanced Research Projects Agency (DARPA)*, 1997–2001.
24. Techniques for Enhancing the Power and Performance of Equational Systems, \$159,183, *National Science Foundation, 1996-98*. PIs: L. Bachmair, I.V. Ramakrishnan, and R. Sekar.

## Research Funding with Industry

(These grants/contracts did not involve Stony Brook University.)

25. Malware Analytic and Reasoning Capability, PIs: Alok Nigam, Jim Just (Global Infotek, Inc.), R. Sekar, \$650,000 *DISA/NSA*, 2015–16.
26. RAMSES: A Cognitive Immune System, PIs: Jim Just (Global Infotek, Inc.) and R. Sekar, \$1,490,048, *Defense Advanced Research Projects Agency (DARPA)*, 2006–08.
27. Diversity Algorithms for Worrysome Software and Networks, PI: J. Just, Global Infotek, Co-PIs: K. Levitt, J. Rowe and Z. Su (UC at Davis), Consultant: R. Sekar \$1,316,000, *Defense Advanced Research Projects Agency (DARPA)*, 2004–05.
28. A New Approach for Effective Detection of Cyber Attacks Based on Anomalous Program Behaviors, PI: U. Ganapathy, *Immunet Security Solutions, Inc.*, Chief scientist/consultant: R. Sekar, \$100,000, *National Science Foundation (SBIR)*, 2003.
29. A System for Accurate Detection of Known and Novel Attacks in High Speed Networks, PI: U. Ganapathy, *Immunet Security Solutions, Inc.*, Chief scientist/consultant: R. Sekar, \$100,000, *Department of Energy (SBIR)*, 2002-03.
30. Securing Operating Systems Against Intruder Attacks, \$100,000, *National Science Foundation (SBIR)* PI: U. Ganapathy, *Immunet Security Solutions, Inc.*, Chief scientist/consultant: R. Sekar, 2002.

# Publications

## Book Chapters

1. Term Indexing, R. SEKAR, I.V. RAMAKRISHNAN AND A. VORONKOV, *Handbook of Automated Reasoning*, Edited by A. ROBINSON AND A. VORONKOV, Chapter 26, Elsevier Science Publishers B.V., 2001, pages 1855–1964.
2. Safe Execution of Mobile and Untrusted Code: The Model-Carrying Code Project, R. SEKAR ET AL, *Information Security Research*, Wiley Publishers, 2007.
3. Formal Verification of a Microprocessor Using Equational Techniques, R. SEKAR AND M.K. SRIVAS, *Current Trends in Hardware Verification and Automated Theorem Proving (Chapter 4)*, pages 171–217. Springer-Verlag, 1989.

## Refereed Conference Publications

4. *Protecting COTS Binaries from Disclosure-guided Code Reuse Attacks*, Mingwei Zhang, Michalis Polychronakis and R. Sekar, *Annual Computer Security Applications Conference (ACSAC)*, 2017.
5. *SLEUTH: Real-time Attack Scenario Reconstruction from COTS Audit Data*, Md Nahid Hossain, Sadegh Milajerdi, Junao Wang, Birhanu Eshete, Rigel Gjomemo, R. Sekar, Scott D. Stoller and V.N. Venkatakrishnan, *USENIX Security Symposium (USENIX Security)*, 2017.
6. *Function Interface Analysis: A Principled Approach for Function Recognition in COTS Binaries*, Rui Qiao and R. Sekar, *Dependable Systems and Networks (DSN)*, 2017.
7. *Extracting Instruction Semantics Via Symbolic Execution of Code Generators*, Niranjana Hasabnis and R. Sekar, *Foundations of Software Engineering (FSE)*, 2016.
8. *Hardening OpenStack Cloud Platforms against Compute Node Compromises*, Wai-Kit Sze, Abhinav Srivastava, and R. Sekar, *ACM Symposium on Information, Computer and Communications Security. (ASIACCS)*, 2016.
9. *Lifting Assembly to Intermediate Representation: A Novel Approach Leveraging Compilers*, Niranjana Hasabnis and R. Sekar, *ACM Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2016.
10. *A Principled Approach for ROP Defense*, Qiao Rui, Mingwei Zhang and R. Sekar, *Annual Computer Security Applications Conference (ACSAC)*, 2015.
11. *Provenance-based Integrity Protection for Windows*, Wai-Kit Sze and R. Sekar, *Annual Computer Security Applications Conference (ACSAC)*, 2015.
12. *JaTE: Transparent and Efficient JavaScript Confinement*, Tung Tran, Riccardo Pelizzi and R. Sekar, *Annual Computer Security Applications Conference (ACSAC)*, 2015.
13. *Code and Control Flow Integrity for COTS binaries: An Effective Defense Against Real-World ROP Attacks*, Mingwei Zhang and R. Sekar, *Annual Computer Security Applications Conference (ACSAC)*, 2015.
14. *Checking Correctness of Code Generator Architecture Specifications*, Niranjana Hasabnis, Qiao Rui and R. Sekar, *ACM/IEEE International Symposium on Code Generation and Optimization (CGO)*, February, 2015.
15. *Code-Pointer Integrity*, Volodymyr Kuznetsov, Laszlo Szekeres, Mathias Payer, George Candea, R. Sekar and Dawn Song, *USENIX Operating System Design and Implementation (OSDI)*, October, 2014.
16. *Comprehensive Integrity Protection for Desktop Linux (Demo)*, Wai-Kit Sze and R. Sekar, *ACM Symposium on Access Control Models and Technologies (SACMAT)*, June, 2014.



17. *Towards More Usable Information Flow Policies for Contemporary Operating Systems*, Wai-Kit Sze, Bhuvan Mital and R. Sekar, *ACM Symposium on Access Control Models and Technologies (SACMAT)*, June, 2014. **Honorable mention for Best paper.**
18. *A Platform for Secure Static Binary Instrumentation*, Mingwei Zhang, Qiao Rui, Niranjana Hasabnis and R. Sekar, *Virtual Execution Environments (VEE)*, March, 2014.
19. *A Portable User-Level Approach for System wide Integrity Protection*, SZE WAI-KIT AND R. SEKAR, *Annual Computer Security Applications Conference (ACSAC)*, 2013. *Acceptance rate: 19%.*
20. *Control-flow integrity for COTS binaries*, MINGWEI ZHANG AND R. SEKAR, *USENIX Security Symposium*, 2013. *Acceptance rate: 16%. Best paper award.*
21. *Protection, Usability and Improvements in Reflected XSS Filters*, RICCARDO PELIZZI AND R. SEKAR, *ACM Symposium on Information, Computer and Communications Security. (ASIACCS)*, 2012. *Acceptance rate: 22%.*
22. *Light-weight Bounds Checking*, NIRANJANA HASABNIS, ASHISH MISRA AND R. SEKAR, *ACM/IEEE International Symposium on Code Generation and Optimization (CGO)*, 2012.
23. *Taint-Enhanced Anomaly Detection*, LORENZO CAVALLARO AND R. SEKAR, *International Conference on Information Systems Security (ICISS)*, 2011. *Acceptance rate: 19%.*
24. *A Server- and Browser-Transparent CSRF Defense for Web 2.0 Applications* RICCARDO PELIZZI AND R. SEKAR, *Annual Computer Security Applications Conference (ACSAC)*, 2011. *Acceptance rate: 18%.*
25. *PAriCheck: An Efficient Pointer Arithmetic Checker for C Programs*, YVES YOUNAN, PIETER PHILIPPAERTS, LORENZO CAVALLARO, R. SEKAR, FRANK PIESENS AND WOUTER JOOSEN, *ACM Symposium on Information, Computer and Communications Security (ASIACCS)*, 2010. *Acceptance rate: 15%.*
26. *Online Signature Generation for Windows Systems*, LIXIN LI, R. SEKAR AND JAMES E. JUST, *Annual Computer Security Applications Conference (ACSAC)*, December 2009. *Acceptance rate: 20%.*
27. *An Efficient Black-box Technique for Defeating Web Application Attacks*, R. SEKAR, *ISOC Network and Distributed Systems Symposium (NDSS)*, 2009. *Acceptance rate: 11%.*
28. *Fast Packet Classification using Condition Factorization*, ALOK TONGAONKAR, R. SEKAR AND SREENAATH VASUDEVAN, *International Conference on Applied Cryptography and Network Security*, Paris, France, 2009. *Acceptance rate: 20%.*
29. *Practical Proactive Integrity Preservation: A Basis for Malware Defense*, WEIQING SUN, R. SEKAR, GAURAV POOTHIA AND TEJAS KARANDIKAR, *IEEE Symposium on Security and Privacy*, 2008. *Acceptance rate: 11%.*
30. *A Practical Mimicry Attack Against Powerful System-Call Monitors*, CHETAN PARAMPALLI, R. SEKAR AND ROB JOHNSON, *ACM Symposium on Information, Computer and Communications Security (ASIACCS)*, 2008. *Acceptance rate: 22%.*
31. *Fast Packet Classification for Snort*, ALOK TONGAONKAR, SREENAATH VASUDEVAN, AND R. SEKAR, *22nd USENIX Large Installation System Administration Conference (LISA)*, 2008.
32. *Data Space Randomization (DSR)*, SANDEEP BHATKAR AND R. SEKAR, *Detection of Intrusions, Malware and Vulnerability Analysis (DIMVA)*, 2008.
33. *Efficient Fine-Grained Binary Instrumentation with Applications to Taint-Tracking*, PRATEEK SAXENA, R. SEKAR AND VARUN PURANIK, *ACM/IEEE International Symposium on Code Generation and Optimization (CGO)*, 2008.
34. *On the Limits of Information Flow Techniques for Malware Analysis and Containment*, LORENZO CAVALLARO, PRATEEK SAXENA, AND R. SEKAR, *Detection of Intrusions, Malware and Vulnerability Analysis (DIMVA)*, 2008.

35. *Expanding Malware Defense by Securing Software Installations*, WEIQING SUN, R. SEKAR, ZHENKAI LIANG AND V.N. VENKATAKRISHNAN, *Detection of Intrusions, Malware and Vulnerability Analysis (DIMVA)*, 2008.
36. Inferring Higher Level Policies from Firewall Rules, ALOK TONGAONKAR, NIRANJAN INAMDAR, AND R. SEKAR, *21th USENIX Large Installation System Administration Conference (LISA)*, Dallas, TX, 2007.
37. Provably Correct Runtime Enforcement of Non-Interference Properties, V.N. VENKATAKRISHNAN, W. XU, D. DUVARNEY AND R. SEKAR, *8th International Conference on Information and Communications Security (ICICS)*, 2006.
38. Address-Space Randomization for Windows Systems, L. LI, J. JUST AND R. SEKAR, *Annual Computer Security Applications Conference, December 2006*.
39. Taint-Enhanced Policy Enforcement: A Practical Approach to Defeat a Wide Range of Attacks, WEI XU, S. BHATKAR AND R. SEKAR, *USENIX Security Symposium*, 2006. *Acceptance rate: 12%*.
40. Dataflow Anomaly Detection, S. BHATKAR, A. CHATURVEDI AND R. SEKAR, *IEEE Security and Privacy*, 2006. *Acceptance rate: 9.2%*.
41. A Framework for Building Privacy-Conscious Composite Web Services, WEI XU, V.N. VENKATAKRISHNAN, R. SEKAR AND I.V. RAMAKRISHNAN, *4th IEEE International Conference on Web Services (ICWS) (Application Services and Industry Track)*, 2006.
42. Automatic Generation of Buffer Overflow Attack Signatures: An Approach Based on Program Behavior Models, Z. LIANG AND R. SEKAR, *Annual Computer Security Applications Conference*, 2005. *Acceptance rate: 19%*.
43. Automated, Sub-second Attack Signature Generation: A Basis for Building Self-Protecting Servers, Z. LIANG AND R. SEKAR, *ACM Computer and Communication Security*, 2005. *Acceptance rate 15%*.
44. Efficient Techniques for Comprehensive Protection from Memory Error Exploits, S. BHATKAR, R. SEKAR AND D. DUVARNEY, *USENIX Security Symposium*, 2005. *Acceptance rate: 14%*.
45. One-way isolation: An Effective Approach for Realizing Safe Execution Environments, W. SUN, Z. LIANG, R. SEKAR AND V.N. VENKATAKRISHNAN, *ISOC Network and Distributed Systems Symposium (NDSS)*, San Diego, 2005, pages 265–278. *Acceptance rate: 13%*
46. V-NetLab: A Cost-Effective Platform to Support Course Projects in Computer Security, K. KRISHNA, W. SUN AND R. SEKAR, *9th Colloquium for Information Systems Security Education*, Atlanta, Georgia, 2005.
47. Automatic Synthesis of Filters to Discard Buffer Overflow Attacks: A Step Towards Realizing Self-Healing Systems, Z. LIANG, R. SEKAR AND D. DUVARNEY, *USENIX Technical Symposium*, (Short paper), Anaheim, 2005, pages 375–378. *Acceptance rate: 24%*
48. A Secure Composition Framework for Trustworthy Personal Information Assistants, V.N. VENKATAKRISHNAN, WEI XU, I.V. RAMAKRISHNAN AND R. SEKAR, *IEEE International Conference Integration of Knowledge Intensive Multi-Agent Systems (KIMAS)*, 2005.
49. An Efficient and Backwards-Compatible Transformation to Ensure Memory Safety of C Programs, WEI XU, DANIEL C. DUVARNEY, AND R. SEKAR, *ACM SIGSOFT International Symposium on the Foundations of Software Engineering (FSE)*, Newport Beach, CA, 2004, pages 117–126. *Acceptance rate: 15%*
50. Isolated Program Execution: An Application Transparent Approach for Executing Untrusted Programs, Z. LIANG, V.N. VENKATAKRISHNAN AND R. SEKAR *Annual Computer Security Applications Conference*, Las Vegas, NV, 2003, pages 182–191. **Best paper award.**

51. Model-Carrying Code: A Practical Approach for Safe Execution of Untrusted Applications, R. SEKAR, V.N. VENKATAKRISHNAN, SAMIK BASU, SANDEEP BHATKAR AND DAN DUVARNEY, *ACM Symposium on Operating Systems Principles (SOSP)*, Bolton Landing, NY, 2003, pages 15–28. Acceptance rate 17%
52. An Approach for Detecting Self-Propagating Email Using Anomaly Detection, A. GUPTA AND R. SEKAR, *Recent Advances in Intrusion Detection*, Pittsburgh, September 2003, pages 55–72. Acceptance rate: 29%
53. Address Obfuscation: An Efficient Approach to Combat a Broad Range of Memory Error Exploits, SANDEEP BHATKAR, DANIEL C. DUVARNEY, AND R. SEKAR, *USENIX Security Symposium*, Baltimore, August 2003, pages 105–120. Acceptance rate 16%
54. Specification-Based Anomaly Detection, R. SEKAR ET AL, *ACM Computer and Communication Security*, Washington, November 2002, pages 265–274. Acceptance rate: 13%
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