Curriculum Vitae
Michel CUKIER

Notarization. I have read the following and certify that this curriculum vitae is a current and accurate statement of my professional record.

Signature_____ Date_____

Professional Experience

November 2001 to present

Reliability Engineering Program

Department of Mechanical Engineering,

Also affiliated with the Department of Electrical and Computer Engineering,

Also affiliated with the Department of Computer Science,

Also affiliated with the Institute for Systems Research

University of Maryland, College Park, MD, USA

Assistant Professor

November 1996 to November 2001

Center for Reliable and High-Performance Computing

University of Illinois, Urbana, IL, USA

Principal Research Scientist (October 1999 to November 2001)

Visiting Research Assistant Professor (October 1998 to September 1999)

Visiting Research Associate (October 1997 to September 1998)

Postdoctoral Research Associate (November 1996 to September 1997)

- Co-developer of a flexible infrastructure (Proteus) to provide adaptive fault tolerance to CORBA compliant applications
- Co-developer of a tool (Loki) for fault injection based on a partial view of the global state of a distributed system
- Co-developer of an evaluation method using probabilistic verification for round-based consensus protocols
- Co-developer of algorithms tolerating arbitrary faults resulting from staged attacks and providing unpredictable adaptations
- Co-adviser of several MS and Ph.D. students on three DARPA funded projects: “Adaptive Quality of Service Availability” (AQuA), “Dependability Management in the Quorum Integration Effort”, and “Intrusion Tolerance by Unpredictable Adaptation” (ITUA)
- Co-developer of the “Validating High-Availability Systems” 5NINES Short Course for Motorola University
- Contributor to new research project proposals

October 1992 to October 1996

Dependable Computing and Fault Tolerance

LAAS-CNRS, Toulouse, France

Doctorate candidate in Computer Science

- Developed and implemented several statistical Frequentist and Bayesian methods to estimate the coverage (i.e., efficiency) of fault-tolerant systems
- Developed and implemented a framework to compare the various statistical methods using simulation
- Developed and implemented a method to estimate the parameters of the time-dependent coverage based on a simple Markovian model of a fault-tolerant mechanism

September 1991 to September 1992

Computer Science and Applied Mathematics Department

Free University of Brussels, Belgium

System Administrator

- Managed a network of Unix workstations (Controlled the integrity and security; Installed disks, printers and new versions of the OS)

Rational Mechanics Department

Free University of Brussels, Belgium

Teaching Assistant

- Supervised groups of 35 students (Organized office hours; Wrote and corrected exams)

Education

July 1996 Doctorate in Computer Science

National Polytechnic Institute of Toulouse, France

Thesis title: "Estimation of the coverage of fault tolerant systems"

Advisor: Dr. David Powell (Grade: "Very honorable and with the committee's congratulations")

July 1991 Degree in Physics Engineering

Free University of Brussels, Belgium

Thesis title: "Determination of the exit time from the safety domain of the state space during an accidental transient"

Advisor**:** Prof. Jacques Devooght (Grade: "High distinction")

July 1986 European Baccalaureate

European School in Brussels, Belgium

Publications

Refereed Journal Publications ("*" = published when at UMD)

[1] M. Cukier, D. Powell and J. Arlat, *Coverage Estimation Methods for Stratified Fault-Injection*, *IEEE Transactions on Computers*, vol. 48, no. 7, July 1999, pp.707-723. (Also published in *Year 1 Report*, Esprit Project 20072: Design for Validation, pp.559-591, 1996.) (Impact Factor: 2.419)

[2] J. Ren, M. Cukier, and W. H. Sanders, *An Adaptive Algorithm for Tolerating Value Faults and Crash Failures, Special Issue on Dependable Network Computing in the IEEE Transactions on Parallel and Distributed Systems*, vol. 12, no. 2, February 2001, pp.173-191. (Impact Factor: 1.190)

[3]* J. Ren, T. Courtney, M. Cukier, C. Sabnis, W. H. Sanders, M. Seri, D. A. Karr, P. Rubel, and R. E. Schantz, *AQuA: An Adaptive Architecture that Provides Dependable Distributed Objects*, *IEEE Transactions on Computers*, vol. 52, no. 1, January 2003, pp. 31-50. (Impact Factor: 2.419)

[4]* S. Krishnamurthy, W. H. Sanders, and M. Cukier, *An Adaptive Quality of Service Aware Middleware for Replicated Services, IEEE Transactions on Parallel and Distributed Systems*, vol. 14, no. 11, November 2003, pp. 1112-1125. (Impact Factor: 1.190)

[5]* H. V. Ramasamy, M. Cukier, and W. H. Sanders, *Formal Verification of a Intrusion-Tolerant Group Membership Protocol*, *IEICE Transactions on Information and Systems* special issue on Dependable Computing, vol. E86-D, no. 12, December 2003, pp. 2612-2622. (Impact Factor: 0.274)

[6]* R. Chandra, R. M. Lefever, K. Joshi, M. Cukier, and W. H. Sanders, *A Global-State-Triggered Fault Injector for Distributed System Evaluation*, *IEEE Transactions on Parallel and Distributed Systems*, vol. 15, no. 7, July 2004, pp. 593-605. (Impact Factor: 1.190)

[7]* P. Pal, P. Rubel, M. Atighetchi, F. Webber, W. H. Sanders, M. Seri, H. Ramasamy, J. Lyons, T. Courtney, A. Agbaria, M. Cukier, J. Gossett, and I. Keidar, *An Architecture for Adaptive Intrusion-Tolerant Applications*, *Software: Practice and Experience*, to appear.

Refereed Conference Publications ("*" = published when at UMD)

[8] M. Kaâniche, K. Kanoun, M. Cukier and M. Bastos Martini, *Software Reliability Analaysis of Three Successive Generations of a Switching System*, in *Proc. 1st European Dependable Computing Conference (EDCC-1)*, (Berlin, Germany), LNCS 852, pp.473-490, Springer Verlag, October 1994. (Also published in *2nd Year Report*, Esprit Project N°6362, Predictably Dependable Computing Systems 2, pp.573-592, September 1994.) (**32% acceptance rate**, 106 submitted papers, 34 accepted papers)

[9] D. Powell, M. Cukier and J. Arlat, *On Stratified Sampling for High Coverage Estimations*, in *Proc. 2nd European Dependable Computing Conference (EDCC-2)*, (A. Hlawiczka, J. G. Silva and L. Simoncini, Ed.), (Taormina, Italy), LNCS 1150, pp.37-54, Springer Verlag, October 1996. (**39% acceptance rate**, 66 submitted papers, 26 accepted papers)

[10] M. Cukier, J. Arlat and D. Powell, *Frequentist and Bayesian Coverage Estimations for Stratified Fault-Injection*, in *Proc. 6th IFIP Working Conf. on Dependable Computing for Critical Applications (DCCA-6)*, (M. Dal Cin, C. Meadows and W. H. Sanders, Eds.), Dependable Computing and Fault-Tolerant Systems, 11, pp.43-61, IEEE Computer Society Press, 1998 (Proc. IFIP 10.4 Work. Conf. held in Grainau, Germany, March 1997). (**35% acceptance rate**, 40 submitted papers, 14 accepted papers)

[11] D. Powell, M. Cukier, J. Arlat and Y. Crouzet, *Estimation of Time-Dependent Coverage*, in *Proc. 8th European Workshop on Dependable Computing (EWDC-8)*, Goteborg, Sweden, April 1997, (20 pages). (Also published in *Year 2 Report, Part 2 (Papers)*, Esprit Project 20072: Design for Validation, pp.541-560, 1997.)

[12] H. S. Duggal, M. Cukier, and W. H. Sanders, *Probabilistic Verification of a Synchronous Round-Based Consensus Protocol*, in *Proc. 16th IEEE Symposium on Reliable Distributed Systems (SRDS-97)*, (Durham, NC, USA), pp.165-174, IEEE Computer Society Press, October 1997.

[13] M. Cukier, J. Ren, C. Sabnis, D. Henke, J. Pistole, W. H. Sanders, D. E. Bakken, M. E. Berman, D. A. Karr, and R. E. Schantz, *AQuA: An Adaptive Architecture That Provides Dependable Distributed Objects*, in *Proc. 17th IEEE Symposium on Reliable Distributed Systems (SRDS-98)*, (West Lafayette, IN, USA), pp. 245-253, IEEE Computer Society Press, October 1998. (**34% acceptance rate**)

[14] C. Sabnis, M. Cukier, J. Ren, P. Rubel, W. H. Sanders, D. E. Bakken, and D. A. Karr, *Proteus: A Flexible Infrastructure to Implement Adaptive Fault Tolerance in AQuA*, in *Proc. 7th IFIP Working Conf. on Dependable Computing for Critical Applications (DCCA-7)*, (San Jose, CA, USA), pp. 137-156, IEEE Computer Society Press, January 1999. (**32% acceptance rate**, 62 submitted papers, 20 accepted papers)

[15] M. Cukier, J. Ren, P. Rubel, D. E. Bakken, and D. A. Karr, *Building Dependable Distributed Objects with the AQuA Architecture*, in *Digest of FastAbstracts* presented at the *29th Annual International Symposium on Fault-Tolerant Computing (FTCS-29)*, (Madison, WI, USA), pp. 17-18, June 1999.

[16] M. Cukier, R. Chandra, D. Henke, J. Pistole, and W. H. Sanders, *Fault Injection Based on the Partial Global State of a Distributed System*, in *Proc. 18th IEEE Symposium on Reliable Distributed Systems (SRDS-99)*, (Lausanne, Switzerland), IEEE Computer Society Press, pp. 168-177, October 1999. (**43% acceptance rate**, 60 submitted papers, 26 accepted papers)

[17] J. Ren, M. Cukier, P. Rubel, W. H. Sanders, D. E. Bakken, and D. A. Karr, *Building Dependable Distributed Applications Using AQuA*, in *Proc. 4th IEEE Symposium on High Assurance Systems Engineering (HASE'99)*, (Washington D.C., USA), pp. 189-196, November 1999. (**61% acceptance rate**, 44 submitted papers, 27 accepted papers)

[18] R. Chandra, R. M. Lefever, M. Cukier, and W. H. Sanders, *Loki: A State-Driven Fault Injector for Distributed Systems*, in *Proc. International Conference on Dependable Systems and Networks (FTCS-30 and DCCA-8)*, (New York City, New York, USA), pp. 237-242, June 2000. (**43% acceptance rate**, 131 submitted papers, 56 accepted papers, 4.64 reviews per paper)

[19] R. Chandra, M. Cukier, R. M. Lefever, and W. H. Sanders, *Dynamic Node Management and Measure Estimation in a State-Driven Fault Injector*, in *Proc. 19th IEEE Symposium on Reliable Distributed Systems (SRDS-2000)*, (Nürnberg, Germany), pp. 248-257, October 2000. (**26% acceptance rate**, 85 submitted papers, 22 accepted papers, 3.7 reviews per paper)

[20] S. Krishnamurthy, W. H. Sanders, and M. Cukier, *A Dynamic Replica Selection Algorithm for Tolerating Time Faults in a Replicated Service*, in *Proc. International Conference on Dependable Systems and Networks (DSN-2001)*, (Göteborg, Sweden), pp. 107-116, July 2001. (**35% acceptance rate**, 153 submitted papers, 53 selected papers, about 5 reviewers per paper)

[21] M. Cukier, J. Lyons, P. Pandey, H. V. Ramasamy, W. H. Sanders, P. Pal, F. Webber, R. Schantz, J. Loyall, R. Watro, M. Atighetchi, and J. Gossett, *Intrusion Tolerance in ITUA*, in *Digest of FastAbstracts* presented at the *International Conference on Dependable Systems and Networks (DSN-2001)*, (Göteborg, Sweden), pp. B-64 to B-65, July 2001.

[22] P. Pal, F. Webber, R. Schantz, J. Loyall, R. Watro, W. Sanders, M. Cukier, and J. Gossett, *Survival by Defense-Enabling*, in *Proc. of the New Security Paradigms Workshop 2001*, (Cloudcroft, New Mexico, USA), September 11-13, 2001, pp. 71-78.

[23] M. Seri, T. Courtney, M. Cukier, and W. H. Sanders, *An Overview of the AQuA Gateway*, in *Proc. of the 1st Workshop on The ACE ORB (TAO)*, (St. Louis, MO, USA), August 5-6, 2001, to appear.

[24]* S. Krishnamurthy, W. H. Sanders, and M. Cukier, *An Experimental Evaluation of the Responsiveness of Replica Selection Algorithms*, in *Proc. of the Seventh IEEE International Workshop on Object-oriented Real-time Dependable Systems (WORDS 2002)*, (San Diego, CA) January 7-9, 2002, pp. 119-127.

[25]* S. Krishnamurthy, W. H. Sanders, and M. Cukier, *An Adaptive Framework for Tunable Consistency and Timeliness Using Replication*, in *Proc. International Conference on Dependable Systems and Networks (DSN-2002)*, (Washington, DC, USA), June 23-26, 2002, pp. 17-26. (**31% acceptance rate**, 156 submitted papers, 48 accepted papers, 4.16 reviews per paper)

[26]* H. V. Ramasamy, P. Pandey, J. Lyons, M. Cukier, and W. H. Sanders, *Quantifying the Cost of Providing Intrusion Tolerance in Group Communication Systems*, in *Proc. International Conference on Dependable Systems and Networks (DSN-2002)*, (Washington, DC, USA), June 23-26, 2002, pp. 229-238. (**31% acceptance rate**, 156 submitted papers, 48 accepted papers, 4.16 reviews per paper) and in *Foundations of Intrusion Tolerant Systems* (Jay Lala, ed.), pp. 251-260. Los Alamitos, CA: IEEE Computer Society, 2003.

[27]* M. Cukier and C. S. Smidts, *Using Bayesian Theory for Estimating Dependability Benchmark Measures*, in *Supplemental Volume of the 2002 International Conference on Dependable Systems & Networks (DSN-2002)*, Washington, DC, June 23-26, 2002.

[28]* S. Krishnamurthy, W. H. Sanders, and M. Cukier, *Performance Evaluation of a QoS-Aware Framework for Providing Tunable Consistency and Timeliness*, in *Proc. Tenth International Workshop on Quality of Service (IWQoS 2002)*, (Miami Beach, FL, USA), May 15-17, 2002, pp. 214-223.

[29]* M. Seri, T. Courtney, M. Cukier, V. Gupta, S. Krishnamurthy, J. Lyons, H. Ramasamy, J. Ren, and W. H. Sanders, *A Configurable CORBA Gateway for Providing Adaptable System Properties*, in *Supplemental Volume of the 2002 International Conference on Dependable Systems & Networks (DSN-2002)*, Washington, DC, June 23-26, 2002, pp. G-26 to G-30.

[30]* T. Courtney, J. Lyons, H. V. Ramasamy, W. H. Sanders, M. Seri, M. Atighetchi, P. Rubel, C. Jones, F. Webber, P. Pal. R. Watro, M. Cukier, and J. Gossett, *Providing Intrusion Tolerance with ITUA*, in *Supplemental Volume of the 2002 International Conference on Dependable Systems & Networks (DSN-2002)*, Washington, DC, June 23-26, 2002, pp. C-5-1 to C-5-3.

[31]* W. H. Sanders, M. Cukier, F. Webber, P. Pal, and R. Watro, *Probabilistic Validation of Intrusion Tolerance*, Fast Abstract in the *Supplemental Volume of the 2002 International Conference on Dependable Systems & Networks (DSN-2002)*, Washington, DC, June 23-26, 2002, pp. B-78 to B-79.

[32]* K. R. Joshi, M. Cukier, and W. H. Sanders, *Experimental Evaluation of the Unavailability induced by a Group Membership Protocol*, in Proc. *4th European Dependable Computing Conference (EDCC-4)*, Toulouse, France, October 23-25, 2002, pp. 140-158. (**31% acceptance rate**, 51 submitted papers, 16 accepted papers, 4.25 reviewers per paper)

[33]* H. V. Ramasamy, M. Cukier, and W. H. Sanders, *Formal Specification and Verification of a Group Membership Protocol for an Intrusion-Tolerant Group Communication System*, in Proc. *2002 Pacific Rim International Symposium on Dependable Computing (PRDC2002)*, Tsukuba, Japan, December 16-18, 2002, pp. 9-18. (**65% acceptance rate**, 60 submitted papers, 39 accepted papers, 3 reviewers per paper) and in *Foundations of Intrusion Tolerant Systems* (Jay Lala, ed.), pp. 251-260. Los Alamitos, CA: IEEE Computer Society, 2003.

[34]* Y. (J.) Ren, P. Rubel, M. Seri, M. Cukier, W. H. Sanders, and T. Courtney, *Passive Replication Schemes in AQuA*, in Proc. *2002 Pacific Rim International Symposium on Dependable Computing (PRDC2002)*, Tsukuba, Japan, December 16-18, 2002, pp. 125-130. (**65% acceptance rate**, 60 submitted papers, 39 accepted papers, 3 reviewers per paper)

[35]* S. Singh, M. Cukier, and W. H. Sanders, *Probabilistic Validation of an Intrusion-Tolerant Replication System*, in Proc. *International Conference on Dependable Systems and Networks (DSN-2003)*, San Francisco, CA, June 22-25, 2003, pp. 615-624. (**35% acceptance rate**, 79 submitted papers, 28 accepted papers, over 4 reviewers per paper)

[36]* R. M. Lefever, M. Cukier, and W. H. Sanders, *An Experimental Evaluation of Correlated Network Partitions in the Coda Distributed File System*, in Proc. *22nd Symposium on Reliable Distributed Systems (SRDS 2003)*, Florence, Italy, October 6-8, 2003, pp. 273-282. (**29% acceptance rate**, 126 submitted papers, 36 accepted papers, about 5 reviewers per paper)

[37]* A. Sharma, J. R. Martin, N. Anand, M. Cukier, and W. H. Sanders, *Ferret: A Host Vulnerability Checking Tool*, in Proc. *IEEE Pacific Rim International Symposium on Dependable Computing (PRDC-10)*, Papeete, Tahiti, French Polynesia, March 3-5, 2004, pp. 389-394. (**28% acceptance rate**, 105 submitted papers, 42 accepted papers, 3.5 reviewers per paper)

[38]* S. Panjwani, S. Tan, K. Jarrin, and M. Cukier, *An Experimental Evaluation to Determine if Port Scans are Precursors to an Attack*, in Proc. *International Conference on Dependable Systems and Networks (DSN-2005)*, Yokohama, Japan, June 28-July 1, 2005, pp. 602-611. (**29% acceptance rate**, 94 submitted papers, 27 accepted papers, over 4 reviewers per paper)

[39]* M. Tamizi, M. Weinstein, and M. Cukier, *Automated Checking for Windows Host Vulnerabilities*, in Proc. *16th IEEE International Symposium on Software Reliability Engineering (ISSRE 2005)*, Chicago, IL, November 8-11, 2005, pp. 139-148. (**32% acceptance rate**, 98 submitted papers, 32 accepted papers, over 3 reviewers per paper)

[40]* S. N. Rosenfeld, I. Rus, and M. Cukier, *Modeling and Simulation of the Escalation Archetype in Computer Security*, in Proc. *2006 Symposium on Simulation Software Security (SSSS06)*, Huntsville, AL, April 2-6, 2006, to appear. (**50% acceptance rate**)

[41]* R. Meyer and M. Cukier, *Assessing the Attack Threat due to IRC Channels*, in Proc. *International Conference on Dependable Systems and Networks (DSN06)*, Philadelphia, PA, June 25-28, 2006, to appear. (**24% acceptance rate**, 96 submitted papers, 23 accepted papers, over 4 reviewers per paper)

[42]* M. Cukier, R. Berthier, S. Panjwani and S. Tan, *A Statistical Analysis of Attack Data*, in Proc. *International Conference on Dependable Systems and Networks (DSN06)*, Philadelphia, PA, June 25-28, 2006, to appear. (**24% acceptance rate**, 96 submitted papers, 23 accepted papers, over 4 reviewers per paper)

[43]* S. N. Rosenfeld, I. Rus, and M. Cukier, *Modeling the "Symptomatic Fixes" Archetype in Enterprise Computer Security*, in Proc. *30th Annual International Computer Software and Applications Conference (COMPSAC 2006)*, Chicago, IL, September 18-21, 2006, to appear (**31% acceptance rate**, 183 submitted papers, 57 accepted papers, 3 reviewers per paper)

Technical Reports

[44] M. Cukier, *Détermination du temps de sortie du domaine de sécurité de l'espace des états lors d'un transitoire accidentel*, Travail de Fin d'Etudes (MS thesis), Université Libre de Bruxelles, July 1991.

[45] D. Powell, M. Cukier and J. Arlat, *On the Confidence of Very High Coverage Estimations*, Research Report N°94506, LAAS-CNRS, Toulouse, France, December 1994 (modified in March 1995), 22 pages.

[46] M. Cukier, *Estimation de la couverture de systèmes tolérants aux fautes*, Mémoire de Doctorat (Ph.D. thesis), Institut National Polytechnique de Toulouse, N°1180, July 1996.

Submitted Journal Publications

[47] H. V. Ramasamy, P. Pandey, M. Cukier, and W. H. Sanders, *Group Communication: From Crash-Fault Tolerance to Intrusion Tolerance*, submitted to IEEE Transactions on Dependable and Secure Computing.

[48] M. Cukier, A. Sharma and A. Chou, *Analysis of the Evolution of Passwords in a Computer System*, submitted to IEE Proc. Information Security.

[49] S. Panjwani, S. Tan, K. Jarrin, and M. Cukier, *An Experimental Analysis of Scans and Their Impact on Attacks*, submitted to IEEE Transactions on Dependable and Secure Computing.

Submitted Conference Publications

[50] S. N. Rosenfeld, I. Rus, and M. Cukier, *Archetypal Behavior in Computer Security*, submitted to Sixth European Dependable Computing Conference, Coimbra, Portugal, October 18-20, 2006.

[51] M. Cukier, R. Berthier, and S. Panjwani, *An Evaluation of Combinations of Attack Characteristics for Separating Attacks*, submitted to Sixth European Dependable Computing Conference, Coimbra, Portugal, October 18-20, 2006.

[52] S. Panjwani and M. Cukier, *Quantifying Investment in Security: A Case Study Based on Empirical Data*, submitted to Sixth European Dependable Computing Conference, Coimbra, Portugal, October 18-20, 2006.

[53] H. Sivaramakrishnan, M. Cukier, and M. Djam, *Using Fault Injection and Environmental Perturbation for Vulnerability Discovery*, submitted to Sixth European Dependable Computing Conference, Coimbra, Portugal, October 18-20, 2006.

[54] H. Sivaramakrishnan and M. Cukier, *A Hierarchy of Approaches to Find Security Vulnerabilities in Applications Using Fault Injection*, submitted to 17th IEEE International Symposium on Software Reliability Engineering (ISSRE 2006), Raleigh, North Carolina, November 6-10, 2006.

[55] S. Panjwani and M. Cukier, *An Analysis of One Year of Malicious Traffic*, submitted to 17th IEEE International Symposium on Software Reliability Engineering (ISSRE 2006), Raleigh, North Carolina, November 6-10, 2006.

Invited Talks (unpublished)

[1] *Estimation of the Coverage of Fault-Tolerant Systems* presented at the CRHC Seminar, Coordinated Science Laboratory Department, University of Illinois, Urbana-Champaign, IL, May 1997.

[2] *AQuA: An Adaptive Architecture that Provides Dependable Distributed Objects* presented at LAAS-CNRS, Toulouse, France, August 1998.

[3] *Proteus: A Flexible Infrastructure to Implement Adaptive Fault Tolerance in AQuA* presented at the Illinois Computer Affiliates Program (ICAP) Meeting, University of Illinois, Urbana-Champaign, IL, April 1999.

[4] *Loki: a Global-State-Drive Fault Injector* presented at the IFIP Working Group 10.4 "Dependable Computing and Fault Tolerance" Meeting, Lake Geneva, Wisconsin, June 1999.

[5] *Special Interest Topic: Computer Engineering* presented at the Coordinated Science Laboratory ECE Student Orientation, University of Illinois, Urbana-Champaign, IL, August 1999.

[6] *AQuA: An Adaptive Architecture That Provides Dependable Distributed Objects* presented at the International Workshop on Reliable Middleware Systems, Lausanne, Switzerland, October 1999.

[7] *AQuA: A Framework For Providing Adaptive Fault Tolerance to Distributed Applications,* presented at the Fraunhofer-Maryland group meeting, College Park, MD, March 2002.

[8] *Fault Injection: An Overview* presented at the Fraunhofer-Maryland group meeting, College Park, MD, December 2002.

[9] *Fault Injection: An Overview* presented during ENRE 607 (Reliability Engineering Seminar), University of Maryland, February 2003.

[10] *Fault and Intrusion Tolerance* presented during ENRE 624 (Failure Mechanisms and Effects Laboratory), University of Maryland, April 2003.

[11] *An Experimental Evaluation to Determine if Port Scans are Precursors to an Attack* presented during the Electrical & Computer Engineering Graduate Student Association Seminar, University of Maryland, April 2005.

[12] *An Experimental Evaluation to Determine if Port Scans are Precursors to an Attack* presented the IBM Academy of Technology 3rd Proactive Problem Prediction, Avoidance and Diagnosis Conference: Predictive Techniques for Self-healing and Performance Optimization, April 26-27, Yorktown Heights, New York.

[13] *An Experimental Evaluation to Determine if Port Scans are Precursors to an Attack* presented during ENRE 607 (Reliability Engineering Seminar), University of Maryland, April 2005.

[14] *An Experimental Analysis of Scans and Their Impact on Attacks* presented at an AT&T Seminar, AT&T Labs Research, Florham Park, NJ, August 2005.

[15] *An Experimental Evaluation to Determine if Port Scans are Precursors to an Attack* presented during the Colloquium on Risk and Security of the Internet and Systems (CRiSIS 2005), Bourges, France, October 2005.

[16] *An Experimental Analysis of Scans and Their Impact on Attacks* presented during the ITI Trust and Security Seminar, University of Illinois, Urbana-Champaign, IL, November 2005.

[17] *An Experimental Analysis of Scans and Their Impact on Attacks* presented during the CyLab, Carnegie Mellon, Pittsburgh, PA, March 2006.

[18] *An Experimental Analysis of Scans and Their Impact on Attacks* presented during the Laboratory of Education and Research on Security Assured Information Systems Seminar, University of Pittsburgh, PA, March 2006

[19] *Quantifying the Attack Threat*, presented during the International Conference on Network Security 2006, April 17-18, Reston, Virginia.

Software Demonstration at Technical Conferences

Presented at the DARPA Quorum/High Confidence Computing PI Meeting, July 12-17, 1998, San Diego, CA, USA. (AQuA Architecture 1.0)

Presented at the DARPA Quorum Technology Demonstration Event, February 7-11, 2000, Crystal City, VA, USA. (AQuA Architecture 2.1)

Media Contact

[1] J. Vijayan, “Port scans don’t always precede networks hacks,” Computerworld.com, December 2005. (Also printed in Techworld.com, LinuxWorld.au, ARNnet, csoonline.com and Computerworld Australia.)

[2] S. M. Kerner, “Do hackers look before they leap?,” Internetnews.com, December 2005.

[3] G. Keizer, “Security expert finds port scans not tied to hack attacks,” TechWeb.com, December 2005. (Also printed in InformationWeeks’ securitypipeline.com.)

[4] J. Tombes, “Internet Security Spending Grows, But Is It Properly Targeted?,” Access Intelligence, LLC, Communications Technology’s Pipeline, December 2005. (Also printed in Financial Times’ Global News Wire.)

Contract and Grants

ITUA Validation and Assessment Extension; BBNT Solutions; 1/1/02 – 1/6/04; BBN Technologies, the University of Illinois, the University of Maryland, and Boeing, funded by DARPA, $200K (Subcontract)

BBN Proposal P02-BBN-317/DARPA BAA 02-16; BBNT Solutions; 08/26/02 – 01/28/05; BBN Technologies, Secure Computing, Adventium Laboratories, Draper Laboratory, SRI International, the University of Illinois, and the University of Maryland, funded by DARPA, $171K (Subcontract)

Probabilistic Evaluation of Computer Security based on Experimental Data; funded by NSF; 09/01/03-08/31/08; $400K (PI)

Pending Proposals

CT-ER: System Dynamics Simulation Modeling of Organizational Security, M. Cukier (PI) and I. Rus (Co-PI), NSF, $250K.

CT-ISG: Developing a Framework for Assessing the Attack Threat, M. Cukier (PI), NSF, $484K.

Awards

Best Paper Award at the Pacific Rim International Symposium on Dependable Computing

H. V. Ramasamy, M. Cukier, and W. H. Sanders, *Formal Specification and Verification of a Group Membership Protocol for an Intrusion-Tolerant Group Communication System*, in Proc. *2002 Pacific Rim International Symposium on Dependable Computing (PRDC2002)*, Tsukuba, Japan, December 16-18, 2002, pp. 9-18.

National Science Foundation Faculty Early Career Development (CAREER) Award National Science Foundation

CAREER: Probabilistic Evaluation of Computer Security based on Experimental Data (August 2003)

Teaching

Spring 2002: ENRE 489E – Software Reliability Testing – 6 students –TE: 3.44

Fall 2002: ENRE 489E – Software Reliability Testing – 15 students – TE: 3.14

Spring 2003: ENRE 648J – Information Security – 15 students – TE: 3.00

Fall 2003: ENRE 489E – Software Reliability Testing – 26 students – TE: 2.65

Spring 2004: ENRE 684 – Information Security – 18 students – TE: 3.30

Spring 2004: ENRE 607 – Reliability Engineering Seminars – 11 students – TE: 3.21

Fall 2004: ENES 100 – Introduction to Engineering Design – 36 students – TE: 2.29

Spring 2005: ENRE 684 – Information Security – 16 students – TE: 3.01

Spring 2005: ENRE 607 – Reliability Engineering Seminars – 25 students – TE: 3.06

Fall 2005: ENRE 681 – Software Quality Assurance – 11 students – TE: 2.89

Spring 2006: ENRE 684 – Information Security – 8 students

Spring 2006: ENRE 607 – Reliability Engineering Seminars – 16 students

Course Development

ENRE 489E – Software Reliability Testing

- Offered the first time ever in Spring 2002
- Co-developed the course structure with C. Smidts
- Developed the entire lecture material

ENRE 648J – Information Security

Made substantial changes by adding some practical experience for developing secure systems:

- Condensed the lecture material into 10 weeks
- Developed a new set of lecture slides
- Added presentations on technologies like intrusion detection systems, vulnerability checking tools, firewalls, and virtual private networks
- Introduced a new project on how to combine the reviewed technologies for developing secure systems.

ENRE 681 – Quality Assurance Software

- Developed a new set of lecture slides
- Focused the course on software testing combining theory and hands-on exercises/examples

Advising

Current MS and Ph.D. Students:

Robin Berthier from January 2006, Ph.D. (RE), expected Summer 2008.

Keith Jarrin from May 2004, Ph.D. (RE), expected Summer 2007.

Jesus Molina from August 2005, Ph.D. (ECE), expected Spring 2007.

Susmit Panjwani from September 2003, Ph.D. (RE), expected Summer 2006.

Current Graduate Students:

Pierre-Yves Dion (6 month-long internship (February-August 06) from Ecole Nationale Superieure d'Ingenieurs de Bourges, France)

Regis Cuisset (6 month-long internship (March-September 06) from Ecole Nationale Superieure d'Ingenieurs de Bourges, France)

Current Undergraduate Students:

Jason Schoenbrun (independent study – ENEE 499 – Spring 05 and Fall 05).

Michael Reilly (independent study – ENEE 499 – Spring 05 and Fall 05, CMSC 390 – Fall 05 and CMSC 498A – Spring 06).

Daniel Ilkovich (independent study – ENEE 499 – Fall 05 and Spring 06)

Will Cladek (independent study – ENEE 499L – Fall 05 and ENEE 499 – Spring 06).

David Rubel (independent student – CMSC 498A – Fall 05 and ENRE 489 – Fall 05 and Spring 06).

Brian Bochicco (independent study – ENEE 499 – Fall 05 and Spring 06).

Drew Chen (independent study – ENEE 499 – Fall 05 and ENRE 489 – Spring 06).

Eric Marshall (independent student – CMSC 498A – Spring 06)

Phuc Huynh (independent student – CMSC 390 – Spring 06)

Aaron Silverman (independent study – ENEE 499 – Spring 06)

Wahab Jilani (independent study – ENEE 499 – Spring 06)

Manan Bahri (independent study – ENEE 499 – Spring 06)

Hadi Muliawan (independent study – ENEE 499 – Spring 06)

Lei Guang (independent study – ENEE 499 – Spring 06)

Former MS Students:

Anil Sharma from September 2002 to August 2004 (MS (RE) degree).

Melody Djam from January 2004 to July 2005 (MS (RE) degree).

Shalom Rosenfeld from August 2005 to May 2006 (MS (ECE) degree).

Hari Sivaramakrishnan from October 2005 to May 2006 (MS (ECE) degree).

Former Graduate Students:

Chi Wu from January 2005, Towson student conducting research at UMD (case study – AIT710 – Summer 05).

Hai Bui (independent study – ENEE 699 –Spring 05 and Summer 05).

Robin Berthier (6 month-long internship (March-August 05) from Ecole Nationale Superieure d'Ingenieurs de Bourges, France).

Shalom Rosenfeld (independent study – ENEE 699 – Summer 05).

Xue Wu from September 2002 to September 2003.

Shradha Upadhyay (independent study – ENRE 648 –Fall 04).

Shalini Krishnamurthy (independent study – ENRE 648 –Fall 04).

Vivek Gupta (independent study – ENPM 808 – Fall 05).

Former Undergraduate Students:

Stephanie Tan from May 2004 (hourly position and independent study – ENEE 499 –Fall 04 and Spring 05).

Tsean Chou (independent study – ENEE 499 – Fall 04 and Spring 05).

Matthew Weinstein (independent study – ENEE 499 – Spring 05).

Montasser Quraishi (independent study – ENEE 499 – Spring 05).

Yee Wa Lau (independent study – ENEE 499 – Spring 05).

Matin Tamizi (independent study – ENRE 489 – Spring 05).

Rohit Krishna (independent study – ENEE 499 – Spring 05 and hourly position in Summer 05).

Lienhua Lee (independent study – ENEE 499 – Spring 05 and CMSC 498A – Fall 05).

Robert Meyer (independent study – ENEE 499 – Summer 05 and ENRE 489 – Fall 05).

Eric Wojnar (independent study – ENEE 499 – Summer 05 and ENRE 489 – Fall 05).

Doug Musser (independent study – ENEE 499 – Fall 05).

Matt Jennings (independent study – CMSC 498A – Summer 05).

Firouzeh Jalilian (independent study – CMSC 390 – Fall 05).

Vladimir Semendyai (independent student – CMSC 498A – Fall 05).

Former High School Students:

Malcolm Ethridge from September 04 to May 2005 (ESTEEM Program).

David Jarrin from January 05 to May 2005.

Professional Services

1999:

Session chair at the 18th IEEE Symposium on Reliable Distributed Systems (SRDS-99), October 1999.

2000:

Conference program committee of the Student Forum of the International Conference on Dependable Systems and Networks (FTCS-30 and DCCA-8), June 2000.

Session chair at the International Conference on Dependable Systems and Networks (FTCS-30 and DCCA-8), June 2000.

Program Chair of the International SRDS Workshop on Dependable System Middleware and Group Communication, October 2000.

2001:

Conference program committee of the Fast Abstracts of the International Conference on Dependable Systems and Networks (DSN-2001), July 2001.

Workshop program committee of the Evaluating and Architecting System dependabilitY (EASY) Workshop (hold in conjunction with the International Conference on Dependable Systems and Networks (DSN) and the International Symposium on Computer Architecture (ISCA)), July 2001.

Conference program committee of the 13th European Simulation Symposium and Exhibition, October 2001.

2002:

Conference program committee of the Fast Abstracts of the International Conference on Dependable Systems and Networks (DSN-2002), June 2002.

Session chair at the International Conference on Dependable Systems and Networks (DSN-2002), June 2002.

Workshop program committee of the Workshop on Dependability Benchmarking of the International Conference on Dependable Systems and Networks (DSN-2002), June 2002.

Workshop program committee of the Workshop on the Theoretical Foundations of Middleware of International Symposium on Distributed Objects and Applications (DOA), November 2002.

2003:

Program chair of the Fast Abstracts of the International Conference on Dependable Systems and Networks (DSN-2003), June 2003.

Conference program committee of the Dependable Computing and Communications Symposium of the International Conference on Dependable Systems and Networks (DSN-2003), June 2003.

Session chair at the International Conference on Dependable Systems and Networks (DSN-2003), June 2003.

2004:

Conference program committee of the Dependable Computing and Communications Symposium of the International Conference on Dependable Systems and Networks (DSN-2004), June 2004.

Conference program committee of the Performance and Dependability Symposium of the International Conference on Dependable Systems and Networks (DSN-2004), June 2004.

Session chair at the International Conference on Dependable Systems and Networks (DSN-2004), June 2004.

Conference program committee of the International Workshop on Testability Assessment.

Member of the NSF CyberTrust panel.

Member of the NSF CAREER panel.

2005:

Conference program committee of the Performance and Dependability Symposium of the International Conference on Dependable Systems and Networks (DSN-2005), June-July 2005.

Session chair at the International Conference on Dependable Systems and Networks (DSN-2005), June-July 2005.

2006:

Conference program committee of the Performance and Dependability Symposium of the International Conference on Dependable Systems and Networks (DSN-2006), June-July 2006.

Program Chair of the International Workshop on Empirical Evaluation of Dependability and Security (WEEDS) (In Conjunction with the International Conference on Dependable Systems and Networks, DSN-2006), June 28 2006.

Conference program committee of the Fault-Tolerance and Dependability track of the 26th International Conference on Distributed Computing Systems (ICDCS 2006), July 2006.

Conference program committee of the 17th IEEE International Symposium on Software Reliability Engineering (ISSRE 2006), November 2006.

Conference program committee of the Workshop on Collaboration and Security (COLSEC'06) (hold in conjunction with the 2006 International Symposium on Collaborative Technologies and Systems (CTS 2006)), May 2006.

Conference program committee of the 2006 High Performance Computing & Simulation (HPC&S) Conference (hold in conjunction with the 20th European Conference on Modelling and Simulation (ECMS 2006)), May 2006.

Session chair at the International Conference on Dependable Systems and Networks (DSN-2006), June-July 2006.

Reviewing Activities

2002:

Journal and conference papers reviewed: 11

2003:

Journal and conference papers reviewed: 56

2004:

Several journal (5) and conference papers (15) reviewed

2005:

Several journal and conference papers reviewed (12 – DSN)

Campus Services

2002:

Reliability Engineering Graduate Admission Committee

Ph.D. Qualifier Committee

Raymond C. Knight Committee

2003:

Reliability Engineering Graduate Admission Committee

Ph.D. Qualifier Committee

Ph.D. Committee: Yixin Li, Jörg Walter
MS Committee: Seyed Hamed Nejad-hosseinian

2004:

Reliability Engineering Graduate Admission Committee
Ph.D. Qualifier Committee
Engineering Council Member
Ph.D. Committee: Bin Li
MS Committee: Rajeshree Varangaonkar

2005:

Reliability Engineering Graduate Admission Committee
Ph.D. Qualifier Committee
Engineering Council Member
Salary Committee
Search Committee in Robotics and Design
Ph.D. Committee: Avik Sinha, Yunwei Hu, Dongfeng Zhu
Proposal Defense Committee: Qing Xie, Wende Kong

2006:

Reliability Engineering Graduate Admission Committee
Ph.D. Qualifier Committee
Engineering Council Member
Search Committee in Robotics and Design