

# Wassim Masri

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## EDUCATION

- **Case Western Reserve University, Cleveland, OH**  
Ph.D. in Computer Engineering, January 2005.
- **The Pennsylvania State University, University Park, PA**  
M.S. in Electrical Engineering, May 1988.
- **Case Western Reserve University, Cleveland, OH**  
B.S. in Electrical Engineering, August 1986.
- **American University of Beirut, Beirut, Lebanon**  
First year of Electrical Engineering, 1983.

## ACADEMIC WORK EXPERIENCE

- Spring'09 – **American University of Beirut, Beirut Lebanon**  
Assistant Professor in the Electrical and Computer Engineering Department:  
taught one section of EECE230, and two sections of CMPS 258.
- Fall'04 – Fall'08 **American University of Beirut, Beirut Lebanon**  
Assistant Professor in the Computer Science Department: Developed and  
taught an undergraduate course on computer security, and three graduate  
courses on dynamic program analysis, software reliability, and computer  
security, respectively. Taught undergraduate courses on introductory  
programming, data structures, and programming languages.
- Fall'02 – Fall'03 **Case Western Reserve University, Cleveland, OH**  
Instructor in the EECS Department: Taught an introductory course in  
computer programming using C++; 120 students were enrolled in the class.
- Fall'86 – Sp'88 **The Pennsylvania State University, University Park, PA**  
Research/Teaching Assistant: Researched graphics recognition and image  
processing techniques; developed graphical simulation software to aid in  
teaching signals and systems courses; taught digital systems design and  
circuits labs; managed the Computer Engineering Department's lab.

**REFEREED JOURNALS** (primary author listed first; ranking is provided relative to journals in the same area)

1. **Masri W.**, Podgurski A. and Leon D. An Empirical Study of Test Case Filtering Techniques Based On Exercising Information Flows. *IEEE Transactions on Software Engineering*, July, 2007, vol. 33, number 7, page 454. (*impact factor = 2.13, rank = 1*)
2. **Masri, W.** and Podgurski, A. Measuring the Strength of Information Flows in Programs. *ACM Transactions on Software Engineering and Methodology (TOSEM)*. To appear 2009. (*impact factor = 1.63, rank = 2*)
3. **Masri, W.** Fault Localization Based on Information Flow Coverage. *Software Testing, Verification and Reliability (Wiley)*. To appear 2009. (*impact factor = 1.10, rank = 3*)
4. **Masri, W.** Exploiting the Empirical Characteristics of Program Dependences for Improved Forward Computation of Dynamic Slice. *Empirical Software Engineering (Springer)*, 2008 13:369-399. (*impact factor = 1.03, rank = 4*)
5. **Masri, W.** and Podgurski, A. Algorithms and Tool Support for Dynamic Information Flow Analysis. *Information and Software Technology (Elsevier)*. Vol. 51 (Feb. 2009), pages 385-404. (*impact factor = 0.726, rank = 6*)
6. **Masri, W.** and Podgurski, A. Application-Based Anomaly Intrusion Detection with Dynamic Information Flow Analysis. *Computers & Security (Elsevier)*. Vol. 27 (2008), pages 176-187. (*impact factor = 1.075*)
7. Jabbour R., **Masri W.** and El-Hajj Ali. Optimizing Password Security through Key-Pattern Analysis. *International Journal of Internet Technology and Secured Transactions*. To appear 2009.
8. A. Podgurski, **W. Masri**, Y. McCleese, F. Wolff, and C. Yang, Estimation of Software Reliability by Stratified Sampling, *ACM Transactions on Software Engineering and Methodology*, Vol. 8, issue 3 (July 1999), pp 263-283. (*impact factor = 1.63, rank = 2*)
9. R. Katsuri, S.T. Bow, **W. El-Masri**, J. Shah, J.R. Gattiker, and U.B. Mokate. A System for Interpretation of Line Drawings, *Computer Vision: Advances and Applications* by R. Kasturi and R. C. Jain, *IEEE Computer Society Press*, pp 529-543, 1991.
10. R. Katsuri, S.T. Bow, **W. El-Masri**, J. Shah, J.R. Gattiker, and U.B. Mokate. A System for Interpretation of Line Drawings, *IEEE Transaction on Pattern Analysis and Machine Intelligence, PAMI*, vol.12, no.10, pp 978-992, Oct. 1990. (*impact factor = 4.306, rank = 1*)

**REFEREED CONFERENCES**

1. **Masri W.** and El-Ghali M. Test Case Filtering and Prioritization Based on Coverage of Combinations of Program Elements. *Seventh International Workshop on Dynamic Analysis, WODA, Chicago, IL, 2009.*
2. **Masri W.**, Abou-Assi R., El-Ghali M., and Fatairi N. An Empirical Study of the Factors that Reduce the Effectiveness of Coverage-based Fault Localization. *International Workshop on Defects in Large Software Systems, DEFECTS, Chicago, IL, 2009.*
3. Zaraket F. and **Masri W.** Property Based Coverage Criterion. *International Workshop on Defects in Large Software Systems, DEFECTS, Chicago, IL, 2009.*

4. El-Ghali M. **and Masri W.** and. Intrusion Detection Using Signatures Extracted from Execution Profiles. 5th International Workshop on Software Engineering for Secure Systems, SESS, Vancouver, Canada, 2009.
5. **Masri W.**, Nahas N. and Podgurski, A. Memoized Forward Computation of Dynamic Program Slices. 17th. IEEE International Symposium on Software Reliability Engineering, ISSRE 2006, Raleigh, NC, USA. (30% acceptance)
6. **Masri W.** and Podgurski A. An Empirical Study of the Relationship between Information Flow and Program Dependence. Fourth International Workshop on Dynamic Analysis (WODA 2006), Shanghai, China, May 2006.
7. **W. Masri** and A. Podgurski. "Using Dynamic Information Flow Analysis to Detect Attacks against Applications". Software Engineering for Secure Systems (SESS05). May 15, 2005, St. Louis, MO. (40% acceptance)
8. Leon, D., **Masri W.**, Podgurski. A. "An Empirical Evaluation of Test Case Filtering Techniques Based On Exercising Complex Information Flows". 27th International Conference on Software Engineering, ICSE 2005, St. Louis, MO, May 2005. (14% acceptance).
9. **Masri, W.**, Podgurski, A., and Leon, D. "Detecting and Debugging Insecure Information Flows". 15th. IEEE International Symposium on Software Reliability Engineering, ISSRE 2004. Rennes, France Nov 2-5, 2004 (30% acceptance).
10. A. Podgurski, D. Leon, P. Francis, W. Masri, M. Minch, J. Sun, and B Wang. "Automated Support for Classifying Software Failure Reports", ICSE 2003, International Conference on Software Engineering, May 2003, Portland, Oregon. (13% acceptance)
11. A. Podgurski, C. Yang, and **W. Masri**, "Partition testing, Stratified sampling and Cluster Analysis", ACM SIGSOFT, FSE, Los Angeles, Dec. 7, 1993, pp 169-181. (15% acceptance)
12. A Apicella, C Wood, M Nesaiver, F Hajjar, **W Masri**, "Segmentation of Ventricles in Short Axis NMR Black Blood Images", IEEE Conf. Engineering Medicine and Biology, Nov. 1991.
13. Kasturi, R. Sing-Tze Bow Gattiker, J. Shah, J. **El-Masri, W.** Mokate, U. Honnenahalli, S. "A System for Recognition and Description of Graphics", the 9th International Conf. on Pattern Recognition, Vol.I, pp 255-259, Rome, Italy, Nov. 1988.
14. S. Bow and **W. El-Masri**, "Knowledge-based Graphics Understanding and Description for Document Archival and Retrieval", Proc. SPIE Conf., Advances in Intelligent Robotic Systems, Vol.848, pp 640-647, Nov. 1987.

## GRANTS

2008-2011

- **NSF - Software for Real-World Systems:** "Enhancing the Reliability of Bioinformatics Software by Correlating User Feedback and Execution Data". Research to be conducted in collaboration with Case Western Reserve University. Two separate but linked proposals were submitted, resulting in two separate awards to CWRU and AUB. [Combined award = \$826,383 - AUB's award = \$139,236]

2008-2010

- **ASTF: Automated .NET Program Debugging Based on Dynamic Program Analysis** [\$30,120]

2008-2009

- **AUB University Research Board.** Debugging Based on Dynamic Program Analysis [\$2,856] (second year)
- **Lebanese National Council for Scientific Research.** Debugging Based on Dynamic Program Analysis [LL7,000,000] (second year)

2007-2008

- **AUB University Research Board.** Debugging Based on Dynamic Program Analysis [\$3,600]
- **Lebanese National Council for Scientific Research.** Debugging Based on Dynamic Program Analysis [LL7,000,000]

2006-2007

- **AUB University Research Board.** A Empirical Study of the Strength and Length of Information Flows in Programs [\$3,500]

2005-2006

- **AUB University Research Board.** Application of Dynamic Information Flow Analysis in Software Testing and Security [\$3,200]
- **Lebanese National Council for Scientific Research.** Application of Dynamic Information Flow Analysis in Software Testing and Security [LL7,000,000]

2005

- **AUB University Research Board.** Dynamic Information Flow Analysis and Profiling [\$4,500]

#### **GRANTS PENDING APPROVAL**

- **NSF Software and Hardware Foundations:** “Improving Software Quality through Advanced Program Dependence Analysis”. Research to be conducted in collaboration with Georgia Tech and Case Western Reserve University. [Combined requested funds = \$490,000 - AUB’s requested funds = \$101,775]

#### **DECLINED PROPOSALS**

- **NSF Cyber-Trust:** “Extending and Supporting Program Dependence Analysis to Improve Software Security”. Research to be conducted in collaboration with Georgia Tech. Two separate but linked proposals were submitted. [Combined requested funds = \$453,543 - AUB’s requested funds = \$151,795]

- **NSF CNS - Res in Networking Tech & Sys:** “A Comprehensive Suite of Protocols and Infrastructure Software Tools for Energy Efficient Wireless Sensor Networks”. In collaboration with Dr. Mohamed Watfa. Requested funds = \$262,695

## TEACHING

- Spring 2009 **ECE230 (3cr)** Introduction to Programming, 36 students  
**CMPS 258** (3 cr, 2 sections) Programming Languages, 58 students
- Fall 2008 **CMPS 200** (4 cr) Introductory Programming, 20 students  
**CMPS 212** (4 cr) Intermediate Programming and Data Structures, 21 students  
**CMPS 212** Recitation, 21 students
- Spring 2008 **CMPS 396L** Software Reliability and Security (Developed and taught), 14 students  
**CMPS 212** (4 cr, 2 sections) Intermediate Programming and Data Structures, 40 students
- Fall 2007 **Hewlett leave to Georgia Institute of Technology**
- Spring 2007 **CMPS 297C** Computer Security, 25 students  
**CMPS 258** Programming Languages, 26 students
- Fall 2006 **CMPS 396H** Dynamic Program Analysis (Developed and taught), 18 students  
**CMPS 212** (4 cr) Intermediate Programming and Data Structures, 34 students  
**CMPS 200** (4 cr) Introductory Programming, 41 students
- Spring 2006 **CMPS 297C** Computer Security, 34 students (Developed and taught)  
**CMPS 212** (4 cr, 2 sections) Intermediate Programming and Data Structures, 40 students
- Fall 2005 **CMPS 396C** Computer Security, 19 graduate students  
**CMPS 212** (4 cr) Intermediate Programming and Data Structures, 30 students
- Spring 2005 **CMPS 258** Programming Languages, 38 students  
**CMPS 212** (4 cr, 2 sections) Intermediate Programming and Data Structures, 48 students
- Fall 2004 **CMPS 396C** Computer Security, 28 students (Developed and taught)  
**CMPS 212** (4 cr) Intermediate Programming and Data Structures, 66 students

## GRADUATE STUDENTS

### PhD Students:

Rayane Abdel-Samad

### MS students:

Marwa El-Ghali (graduated Fall 2008)

Rawad Abou-Assi (graduated Fall 2008)

Hiba Halabi (graduated: Spring 2009)

Nour Fatayri (expected graduation: Fall 2009)

**MS Thesis committee member for:** Riham Abdel-Kader, Rami Shibli, Alaa Alawani, Ayman Abi-Abdallah, Mohamad Chouman, Diana Tabet, Linda Yhagi, Fedaa Daryan, Elie Abou Fares, Camille Gaspard (CCE), Youssef Chamoun (CCE), Ravel Jabbour (CCE).

## **STUDENTS ADVISING**

2008 - 2009	45 students
2007 - 2008	45 students
2006 - 2007	54 students
2005 - 2006	120 students
2004 - 2005	50 students

## **SERVICE TO AUB**

2008-present	University Senate committee member
2005	Marshall at commencement

## **SERVICE TO FEA**

2004-present	Reviewed 3 URB proposals submitted by CCE faculty members.
Spring 2009	FYP AdHoc committee

## **SERVICE TO FAS**

2004-present	Reviewed 8 URB proposals submitted by CMPS faculty members
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## **SERVICE TO CMPS**

2007 - 2008	Member, Curriculum Committee
2006 - 2007	Member, Curriculum Committee
2005 - 2006	Member, Graduate Committee Coordinator, Research Seminars
2004 - 2005	Member, Graduate Committee Coordinator, Research Seminars

## **SERVICE TO PROFESSION (Program Committee Membership)**

- 7<sup>th</sup> International Workshop on Dynamic Analysis, WODA 2009, Chicago, Illinois.
- 20<sup>th</sup> IEEE International Symposium on Software Reliability Engineering, ISSRE 2009, Bengaluru-Mysuru, India.
- 19<sup>th</sup> IEEE International Symposium on Software Reliability Engineering, ISSRE 2008, Seattle, Washington.
- Reviewer, 18th. IEEE International Symposium on Software Reliability Engineering, ISSRE 2007, Trollhättan, Sweden
- First International Conference on Software Testing, Verification and Validation, ICST 2008, Lillehammer, Norway, April 2008.
- Testing Academic & Industrial Conference – Practice and Research Techniques, London, UK. TAIC-PART 2009.
- Testing Academic & Industrial Conference – Practice and Research Techniques, London, UK. TAIC-PART 2008.
- Testing Academic & Industrial Conference – Practice and Research Techniques, London, UK. TAIC-PART 2007.
- Testing Academic & Industrial Conference – Practice and Research Techniques, London, UK. TAIC-PART 2006.
- Conference on Current Trends in the Theory and Applications of Computer Science. Notre Dame University (NDU), Lebanon, February 2008.
- Reviewed six proposals for LNCSR

## **IMPROVEMENT ACTIVITIES**

- Presented a paper at WODA'09, July 2009, Chicago, Illinois

- Presented a paper at DEFECTS'09, July 2009, Chicago, Illinois
- Presented a second paper at DEFECTS'09, July 2009, Chicago, Illinois
- Presented a paper at SESS'09, May 2005, Vancouver, Canada
- Presented a paper at WODA'06, May 2006, Shanghai, China
- Presented a paper at SESS'05, May 2005, Saint Louis, MS
- Attended ISSTA 2009, July 2009, Chicago, Illinois
- Attended ICSE 2009, May 2009, Vancouver, Canada
- Attended ICSE 2006, May 2006, Shanghai, China
- Attended ICSE 2005, May 2005, Saint Louis, MS
- Attended a Workshop representing AUB at NDU, 2006 and 2008

## PROFESSIONAL ASSOCIATIONS

- Member ACM
- Member, Institute of Electrical and Electronics Engineers (IEEE)
- Member, IEEE Computer Society
- Member, Order of Engineers, Beirut, Lebanon

## SOFTWARE INDUSTRY EXPERIENCE (1989-2002)

- 2002            **Hyland Software Inc.**, Westlake, OH (2000 hours)  
Designed and developed a suite of automated testing, diagnostics and analysis tools to support the QA and technical support departments.
- 2000 – 2002    **Acero/Incyte-Genomics/IBM**, Cleveland, OH/Palo Alto, CA (3000 hours)  
Designed and developed a computing heterogeneous Farm that enables users to submit parallel tasks, potentially numbering in the thousands. The system is required to dispatch and run the tasks taking into consideration load balancing, throughput, fault-tolerance and recovery. This CORBA based distributed system runs on hybrid platforms comprising Linux, Solaris or Windows. The supported client environments are Java, C++ and Perl. The system was deployed on a cluster of 2500+ Linux execution node managed by several Solaris nodes.
- 1995 – 2001    **Keithley Instruments**, Solon, OH (7000 hours)  
Designed and developed the test definition and data presentation software subsystems for a parametric semiconductor test machine. Provided capabilities to apply transforms and analyze the data in real-time and graphical mode. Designed and developed a suite of front-end applications for a semiconductor process monitoring machine. The applications included an off-line graphical test generator, a real-time control operator interface and a post-processing database/analysis tool. The product was subsequently acquired by KLA-Tencor.
- 2000            **Royal Appliance/Dirt Devil**, Cleveland OH (400 hours)  
Assessed the organization's current software practices then made recommendations to improve them; trained development staff in various object-oriented technologies including EJB and UML.
- 1999 – 2000    **First Energy**, Akron OH (1000 hours)

Developed an E-Bill payment ([www.firstenergycorp.com](http://www.firstenergycorp.com)) and a Customer Service application (Intranet) using WebSphere, Servlets, JSPs and Visual Age for Java.

- 1999 **KeyCorp**, Cleveland OH (1000 hours)  
Developed e-commerce applications ([www.keybank.com](http://www.keybank.com)) for consumer loan lending (e.g., personal, auto, home equity, loan calculators etc.). The assignment involved both Server and Client side development using Java and NetDynamics.
- 1997 – 1999 **Bristol West**, Cleveland OH (4000 hours)  
Lead designer and developer of an Intranet-based Insurance Claims System. This multi-tiered distributed system was deployed in over 40 offices nationwide. The technologies used included: EJB, CORBA, Rational Rose, TOPLINK, and Visual Age for Java.
- 1994 – 1998 **ICG**, Independence, OH (4000 hours)  
Lead the design and development of the customer care and provisioning software system. The system supported a multitude of products including various Local Phone services, Long Distance, Calling Card, and Voice Mail. Those products were provided by various vendors, which required the use of different types of technologies (EDI, EDE etc.) to implement the provisioning process.
- 1990 – 1994 **Philips Medical Systems (R&D)**, Highland Heights, OH (9000 hours)  
Researched and developed a 3-D medical imaging visualization and surgical planning system. In addition to software design and development, the work included 2D and 3D algorithm design and development, e.g: multi-planar reformatting, 3-D surface, volume and angiographic rendering, multiple object disarticulation and fusion.
- 1989 – 1990 **General Electric Medical Systems**, Waukesha, WI (2000 hours)  
Developed a suite of tools to enable medical imaging researchers develop and emulate MRI pulse sequences.