

SUMMARY I develop graph construction and analysis theories, techniques and industry level supporting tools to advance the state of the art in the (1) *information extraction* and (2) *automated correctness* research areas. I teach programming and computer engineering courses with focus on applications of graph analysis in the areas of *data engineering* and *logic synthesis and verification*. My PhD is from the University of Texas at Austin. My Master's and Bachelor's degrees are from AUB. I worked in the industry for around a dozen years at IBM, Sun Microsystems, and Santa Cruz Operations.

RESEARCH INTERESTS *Information extraction* from Arabic and medical documents:

- entity and relational entity (graph entity) extraction
- computational linguistics and morphological analysis of Arabic
- cross document analysis

Automated correctness:

- model checking programs and logic systems
- correct by construction design using synthesis techniques
- specification based testing and coverage metrics

EDUCATION **University of Texas at Austin**, Austin, Texas

Ph.D., *Electrical & Computer Engineering*, Sep. 03–Dec. 07

- Thesis: Program Analysis with Boolean Logic Solvers
- Adviser: **Professor Adnan Aziz**, received his Ph.D. from Berkeley
- Co-adviser: **Professor Sarfraz Khurshid**, received his Ph.D. at MIT
- GPA: 4.00

American University of Beirut, Beirut, Lebanon

M.E. (Feb 01), B.E (Oct 92–Jun 96) *Comp. & Comm. Engineering*

- Thesis: Fusion and Objective Comparison of Edge Detectors
- Adviser: **Professor Adnan Al-Alaoui**

BOOK CHAPTERS

[B1] W. Masri and **F. A. Zaraket**. “Software Testing: Going Beyond Basic Code Coverage Criteria”. In: *Advances in Computers*. Vol. 103. links: [online](#), [pdf](#). Elsevier, 2016. Chap. 4.

[B2] A. Alawieh, Z. Sabra, A. Nokkari, A. El-Assaad, S. Mondello, **F. A. Zaraket**, B. Fadlallah, and F. H. Kobeissy. “Bioinformatics approach to understanding interacting pathways in neuropsychiatric disorders”. In: *Clinical Bioinformatics*. Vol. 1168. links: [online](#), [pdf](#). Springer-Human Press, 2014. Chap. 9.

[B3] **F. A. Zaraket** and Mustafa Jarrar. “Advances in Computer Analysis of the Arabic Language”. In: *Advances in Computers*. Vol. 103. Expected April 2017. Elsevier, 2017. Chap. 4.

JOURNALS

J11–J12 major revision,
J13–J14 under review

[J1] Paul Attie, Saddek Bensalem, Marius Bozga, Mohamad Jaber, Joseph Sifakis, and **F. A. Zaraket**. “Global and Local Deadlock Freedom in BIP”. In: *ACM Transactions on Software Engineering and Methodology* (Jan. 2017). accepted with minor revisions. links: [pdf](#).

[J2] Rawad Abou Assi, Wes Masri, and **F. A. Zaraket**. “UCov: A User-Defined Coverage Criterion for Test Case Intent Verification”. In: *Software Testing, Verification and Reliability* (May 2016). accepted. links: [online](#), [pdf](#).

- [J3] **F. A. Zaraket** and Mohamad Nouredine. “Model Checking Software with First Order Logic Specifications using AIG Solvers”. In: *IEEE Transactions on Software Engineering* (Aug. 2016). links: [online](#), [pdf](#).
- [J4] K. Fawwaz, **F. A. Zaraket**, W. Masri, and H. Harkous. “PBCOV: a property-based coverage criterion”. In: *Software Quality Journal (SQJ)* (Feb. 2015). link: [online](#), [pdf](#).
- [J5] Ali Alawieh, Mohammed Sabra, Zahraa Sabra, Stephen Tomlinson, and **F. A. Zaraket**. “Molecular Architecture of Spinal Cord Injury Protein Interaction Network”. In: *PLOS One* 10 (8 Aug. 2015). F.A.Z. is the corresponding author. links: [online](#), [pdf](#).
- [J6] Ali Alawieh, Mohammed Sabra, Zahraa Sabra, Stephen Tomlinson, and **F. A. Zaraket**. “A Rich-Club Organization in Brain Ischemia Protein Interaction Network”. In: *Scientific reports* (2015). F.A.Z. is the corresponding author. links: [online](#), [pdf](#).
- [J7] A. Alawieh, Zahraa Sabra, Abdul Rahman Bizri, Christopher Davies, Roger White, and **F. A. Zaraket**. “A computational model to monitor and predict trends in bacterial resistance”. In: *Journal of Global Antimicrobial Resistance* (June 2015). F.A.Z. is the corresponding author. links: [online](#), [pdf](#).
- [J8] **F. A. Zaraket**, M. Olleik, and A. Yassine. “Skill-based Framework for Optimal Software Project Selection and Resource Allocation”. In: *European Journal of Operational Research (EJOR)* (Apr. 2014). links: [online](#), [pdf](#).
- [J9] A. Alawieh, **F. A. Zaraket**, Jian-Liang Li, A. Nokkari, M. Razafsha, B. Fadlallah, S. Mondello, R. Boustany, and F. Kobeissy. “Systems Biology, Bioinformatics and Biomarkers in Neuropsychiatry”. In: *Frontiers Journal in Systems Biology* (2012). review paper. link: [online](#), [pdf](#).
- [J10] Jad Makhlouta and **F. A. Zaraket**. “Arabic Temporal Entity Extraction using Morphological Analysis”. In: *International journal of computational linguistics and applications* (June 2012). links: [online](#), [pdf](#).
- [J11] **F. A. Zaraket**, Mohamad Jaber, Mohamad Nouredine, and Ylie’s Falcone. “From High-Level Modeling Towards Efficient and Trustworthy Circuits”. In: *Software Tools for Technology Transfer (STTT)* (2015). major revision. originally submitted March 2015. link: [arxiv](#), [pdf](#).
- [J12] Dalal Hammoud, **F. A. Zaraket**, and Wes Masri. “GUICop: Approach and Toolset for Specification-based GUI Testing”. In: *Software Testing, Verification and Reliability* (2016). major revision. link: [website](#), [pdf](#).
- [J13] **F. A. Zaraket** and Ameen Jaber. “MERF: Morphology-based Entity and Relational Entity Extraction Framework for Arabic”. In: *Language Resources and Evaluation (LRE)* (2014). under review. originally submitted June 2014. [web](#), [pdf](#).
- [J14] Mustafa Jarrar, **F. A. Zaraket**, and Rami Asia. “Diacritic-Aware Arabic Word Matching”. In: *ACM Asian and Low-Resource Language Information Processing (TALLIP)* (2016). under review. link: [web](#), [pdf](#).

- CONFERENCES
- [C1] Maya H. Safieddine, **F. A. Zaraket**, Mohamad Jaber, Rouwaida Kanj, and Mazen A. R. Saghir. “Automated FPGA Implementations of BIP Designs”. In: *IEEE International Symposium on Industrial Embedded Systems (SIES)*. May 2016.
 - [C2] M. Safieddine, **F. A. Zaraket**, R. Kanjand A. Elzein, and W. Rosner. “Methodology for Separation of Design Concerns Using Conservative RTL Flipflop Inference”. In: *DVCon*. link: [pdf](#). San Jose, CA, Mar. 2015.

- [C3] Maya H. Safieddine, Rouwaida Kanj, **F. A. Zaraket**, Ali S. Elzein, and Mohamad Jaber. “Separation of concerns for hardware components of embedded systems in BIP”. In: *International Symposium on Quality Electronic Design, ISQED*. links: [doi](#), [pdf](#). Mar. 2015.
- [C4] S. Bliudze, M. Jaber, M. Nouredine, and **F. A. Zaraket**. “Reduction and Abstraction Techniques for BIP”. In: *Formal Aspects on Component Software (FACS)*. link: [online](#). Bertinoro, Italy, Sept. 2014.
- [C5] P. C. Attie, S. Bensalem, M. Bozga, M. Jaber, J. Sifakis, and **F. A. Zaraket**. “An Abstract Framework for Deadlock Prevention in BIP”. In: *FMOODS/FORTE*. link: [online](#). Florence, Italy, June 2013.
- [C6] E. Shaccour, **F. A. Zaraket**, and W. Masri. “Coverage Specification for Test Case Intent Preservation in Regression Suites”. In: *Regression Workshop, IEEE International Conference on Software Testing, Verification and Validation (ICSTW)*. link: [online](#). Mar. 2013.
- [C7] J. Farjo, R. Abou Assi, W. Masri, and **F. A. Zaraket**. “Does Principal Component Analysis Improve Cluster-Based Analysis?” In: *Regression Workshop, IEEE International Conference on Software Testing, Verification and Validation (ICSTW)*. link: [online](#). Mar. 2013.
- [C8] **F. A. Zaraket**, W. Masri, M. Adam, D. Hammoud, R. Hamzeh, R. Farhat, E. Khamissi, and J. Noujaim. “GUICOP: Specification-Based GUI Testing”. In: *DEFECTS, IEEE International Conference on Software Testing, Verification and Validation (ICSTW)*. link: [online](#). Apr. 2012.
- [C9] W. Masri, R. Abou-Assi, **F. A. Zaraket**, and N. Fatairi. “Enhancing Fault Localization via Multivariate Visualization”. In: *IEEE International Conference on Software Testing, Verification and Validation (ICST)*. link: [online](#). Apr. 2012.
- [C10] **F. A. Zaraket**, M. Nouredine, M. Sabra, and A. Jaber. “Portable Parallel Programs using Architecture-aware Libraries”. In: *ACM 27th Symposium on Applied Computing (SAC)*. link: [online](#). Trento, Mar. 2012.
- [C11] Ali Alawieh, Zahraa Sabra, Mohammed Sabra, and **F. A. Zaraket**. “Novel Bioinformatics Approach Reveals Pathogenic Mechanisms in Cerebral Ischemia - A Step towards Pre-clinical Stroke Information Management System”. In: *International Stroke Conference*. Poster session. link: [online](#). Nashville TN, Feb. 2015.
- [C12] **F. A. Zaraket** and Ameen Jaber. “MATAr: Morphology-based Tagger for Arabic”. In: *The 10th ACS/IEEE International conference on computer systems and applications (AICCSA)*. link: [pdf](#). May 2013.
- [C13] **F. A. Zaraket** and Jad Makhlouta. “Arabic Morphological Analyzer with Agglutinative Affix Morphemes and Fusional Concatenation Rules”. In: *COLING 2012: Demonstration Papers*. link: [pdf](#). Dec. 2012.
- [C14] Jad Makhlouta and **F. A. Zaraket**. “Arabic Cross-Document NLP for the Hadith and Biography Literature”. In: *Florida artificial intelligence research society, Applied natural language processing track (FLAIRS-ANLP)*. link: [pdf](#). May 2012.
- [C15] Jad Makhlouta, Hamza Harkous, and **F. A. Zaraket**. “Arabic Entity Graph Extraction using Morphology, Finite State Machines, and Graph Transformations”. In: *13th International Conference on Intelligent Text Processing and Computational Linguistics (CICLing)*. Lecture notes in computer sciences (LNCS). links: [doi](#) [pdf](#). Mar. 2012.
- [C16] R. El-Jurdi, G. Sayegh, H. Salami, I. Abou-Faycal, and **F. A. Zaraket**. “Minimum Power Broadcast Trees Subject to Interference”. In: *IEEE International Symposium on Wireless Communications Systems (ISWCS)*. link: [online](#). Oct. 2014.

- [C17] S. Batlouni, H. Karaki, **F. A. Zaraket**, and F. A. Karameh. “Mathifier: Speech Recognition of Math Equations”. In: *IEEE International Conference on Electronics Circuits and Systems (ICECS)*. link [pdf](#). Beirut, Dec. 2011.
- [C18] **F. A. Zaraket**, John Pape, Adnan Aziz, Magarida Jacome, and Sarfraz Khurshid. “Global Optimization of Compositional Systems”. In: *Formal Methods in Computer Aided Design (FMCAD)*. link: [doi](#). 2007.
- [C19] **F. A. Zaraket**, Adnan Aziz, and Sarfraz Khurshid. “Sequential circuits for program analysis”. In: *ACM/IEEE Automated Software Engineering*. link: [online](#). Nov. 2007.
- [C20] **F. A. Zaraket**, Adnan Aziz, and Sarfraz Khurshid. “Sequential Circuits for Relational Analysis”. In: *ACM/IEEE International Conference on Software Engineering*. link: [online](#). May 2007.
- [C21] **F. A. Zaraket**, J. Baumgartner, and A. Aziz. “Scalable Compositional Minimization via Static Analysis”. In: *ACM/IEEE Computer-Aided Design*. link: [online](#). Nov. 2005.

PATENTS

- [P1] A. Alawieh, Z. Sabra, and **F. A. Zaraket**. “Literature-based Mining of Proteomics Data Applied to Alzheimers Disease”. Pat. NA. application sent by MUSC in agreement with AUB office of grants and contracts. 2014.
- [P2] A. El-zein and **F. A. Zaraket** — **originating author**. “Co-optimization of embedded systems utilizing symbolic execution”. Pat. 8,234,604. July 2012.
- [P3] J. Baumgartner, A. El-Zein, V. Paruthi, and **F. A. Zaraket** — **originating author**. “Sequential encoding for relational analysis (SERA) of a software model”. Pat. 8,141,048. Mar. 2012.
- [P4] G. Drasny, A. El-Zein, W. Roesner, and **F. A. Zaraket**. “Techniques for modeling variables in subprograms of hardware description language programs”. Pat. 8,140,313. Mar. 2012.
- [P5] J. Baumgartner, H. Mony, V. Paruthi, and **F. A. Zaraket** — **originating author**. “Predicate-based compositional minimization in a verification environment”. Pat. 8,086,429. Dec. 2011.
- [P6] J. Baumgartner, H. Mony, V. Paruthi, and **F. A. Zaraket** — **originating author**. “Predicate selection in bit-level compositional transformations”. Pat. 8,037,085. Oct. 2011.
- [P7] G. Drasny, B. Gabor, A. El-zein, and **F. A. Zaraket** — **originating author**. “Unrolling hardware design generate statements in a source window debugger”. Pat. 7,823,097. Oct. 2010.
- [P8] G. Drasny, B. Gabor, A. El-zein, **F. A. Zaraket**, and H. Sharafeddin. “Method, system, and program product for pre-compile processing of hardware design language (HDL) source files”. Pat. 7,506,287. Mar. 2009.
- [P9] **F. A. Zaraket** — **originating author**, J. Baumgartner, H. Mony, and V. Paruthi. “Method for predicate-based compositional minimization in a verification environment”. Pat. 7,437,690. Oct. 2008.
- [P10] J. Baumgartner, **F. A. Zaraket**, H. Mony, and V. Paruthi. “Enhanced structural redundancy detection”. Pat. 7,360,181. Apr. 2008.

FUNDS

- Masri Institute, “Flexibility-based Scheduling for Smart Grids/Smart Homes Energy Management”, \$12,600, Sept. 1 2016, 2 years, co-PI with R. Kanj and A. Kaysi.
- Saifi Institute, “Multilingual Toolset development: modern standard Arabic, Levantine Arabic, and English”, \$48,200, January 2016 to June 2017.

- Farouk Jabre research award, “Automated Symptom and Diagnosis Detection from Clinical Notes”, 24,000 USD, co-PI Ghassan Hamadeh (AUBMC), April 2014.
- European Union Commission, FP7, “Cooperation with Mediterranean Partners to build Opportunities around Societal And Industrial Challenges of Horizon 2020”, 780,000 Euros for three years, AUB-PI, with Tonny Vellin (Proposal lead PI) and 12 partners, March 2014.
- AUB FEA Dean’s office, “Information Discovery from Clinical Notes using Statistical and Knowledge-based Computational Linguistics”, \$14,000, 2013-2014, with G. Hamadeh and M. Jaber.
- Dar Al handasah: “The Lebanese Outsourcing Potential”, interdisciplinary research, 2 years, \$19,500 per year, in collaboration with A. Yassine
- Lebanese National Council for Scientific Research:
 - “Non-invasive prenatal baby monitoring techniques”, Dec 2015, Dec 2017, LL. 20,000,000 (10,000,000 per year). co-PI with L. Sharafeddine.
 - “Modeling DNA Repair Mechanism (MMR) for Understanding Defects Missed by MMR Leading to Congenital Heart Disease (CHD)”, Jan 1, Dec 31 2015, LL 8,000,000. co-PI with A. Asaad and Z. Dawy.
 - “Framework for Assessing Offshore Software Project Selection and Resource Allocation”, Jan 1, Dec 31 2013. LL8,000,000. co-PI with A. Yassine.
 - “Improving Ambiguity of Arabic Morphological Analysis Using Partial Diacritics, Linguistic Morphological Rules, Gloss Tags, and Syntax Tags”, Oct 1,2012-Oct 1, 2013. LL8,000,000.
 - “Relational Queries for Arabic Text Mining”, LL8,000,000 per year. 2 years, December 2009-December 2011. PI.
 - “Opinion Polling in English and Arabic Web Pages”, LL8,000,000 per year. December 2009-December 2010. Co-PI with H. Hajj.
- AUB University Research Board (URB)
 - “Interactive Specification and Implementation Construction”, 2013-2015, \$12,000 (6,000 per year)
 - “Coverage Criteria for Software Programs using Formal Specifications”, 2012-2013, \$6,000
 - “Coverage Criteria for Software Programs using Formal Specifications”, 2012-2013, \$6,000
 - “Encoding Software Programs into Satisfiability Modulo Theory Formulas without Bounds”, 2011-2012, \$6,000
 - “Compositional Minimization Transformation for Software Artificats”, 2010-2011, \$10,000
 - “Program Analysis using Transformation and Decision Algorithms”, 2009-2010, \$7,000

RESEARCH GROUP

My research team currently consists of two PhD students, four graduate research assistants, and four undergraduate research assistants.

- **Maya Safieddine**, Phd, working on RTL level verification.
coadvisor: R. Kanj.
- **Ameen Jaber**, Phd, 2014-2015 working on computational Arabic.
Masters, Feb 2014, Arabic information extraction.
- **Dalal Hammoud**, Masters, Sep. 2015, Specification based GUI testing.
Working at a Murex consulting company.
- **Mohamad Sabra**, Masters, August 2015, medical information extraction.
Working at Touch, Lebanon.

- **Christina Abboud**, Masters, June 2013. Adaptive resonance techniques.
coadviser with F. Karame.
Working at Google, Zurich.
- **Jad Makhoul**, Masters, June 2012. Computational Arabic.
Working at Mobilica, Lebanon.
- **Majd Oleik**, Masters, June 2012. The Lebanese software industry.
coadviser with A. Yassine.
Consultant to Lebanese Petroleum Association.
- **Mohamad Nouredine**, Masters June 2013, Model checking software programs.
PhD student at University of Illinois at Urbana Champaign (UIUC).
- **Iman Kawwas**, Masters Sep. 2015, Computational Arabic. co-adviser with H. Hajj.
- Graduate research assistants
 - **Ali Alawieh**, May 2013–current, IE medical
MD-PhD at meMUSC
 - **Zahraa Sabra**, May 2013–current, IE medical
PhD at MUSC
 - **Amani Jaber**, September 2013–current, IE medical
MD LAU, Resident AUB
 - **Kassem Fawaz**, 2010-2011, Property based coverage
PhD at University of Michigan at Ann Arbor (UMICH).
- Undergraduate research assistants
 - **Farah Hariri**, 2012–2014, Specification construction
PhD student at University of Illinois at Urbana Champaign (UIUC).
 - **Mohamad Fawaz**, Summer 2013, Behaviors and specifications
PhD student at University of Toronto.
 - **Rafah Al-Khatib**, 2012-2013, C to Satisfiability Modulo Theory Translation
PhD student at École Polytechnique Fédérale de Lausanne (EPFL).
 - **Hamza Harkous**, 2009–2010, Arabic morphological analysis
PhD student at École Polytechnique Fédérale de Lausanne (EPFL).
 - **Maurice Abou Jaoudeh**, 2013-2014, Medical Natural Language Processing
Masters students at École Polytechnique Fédérale de Lausanne (EPFL).
 - **AbdulRahman AlHamali**, 2012-2014, Arabic Temporal Normalization
 - **Joseph Mourad**, 2014-2015, Logic Construction From Type Theory
- I also supervise undergraduate students for their Final Year Projects which often happen to be research orientated.

COURSES

The schedule below details the courses I taught at AUB. EECE-501/502 are senior project courses. EECE798 and EECE796 are special topic and project courses, respectively. EECE635, EECE798E, and EECE796 are given in tutorial mode.

Semester	Course Title	Students
Spring 09	EECE-432 <i>Operating Systems</i>	48
	EECE-636 <i>Logic Synthesis & Verification</i>	2
Fall 09	EECE-330 <i>Data Structures & Algorithms</i>	36
	EECE-637 <i>Advanced Programming Practices</i>	7
	EECE-501 <i>Final Year Project</i>	12
Spring 10	EECE-432 <i>Operating Systems</i>	31
	EECE-636 <i>Logic Synthesis & Verification</i>	6
	EECE-502 <i>Final Year Project</i>	12
	EECE-635 <i>Introduction to Computational Arabic</i>	4
Fall 10	EECE-330 <i>Data Structures & Algorithms</i>	27
	EECE-637 <i>Advanced Programming Practices</i>	24
	EECE-501 <i>Final Year Project</i>	15
Spring 11	EECE-432 <i>Operating Systems</i>	52
	EECE-636 <i>Logic Synthesis & Verification</i>	6
	EECE-635 <i>Introduction to Computational Arabic</i>	2
	EECE-502 <i>Final Year Project</i>	15
Summer11	EECE-796 <i>LTL Synthesis using Auxiliary Variables</i>	2
Fall11	EECE-501 <i>Final Year Project</i>	6
	EECE-798E <i>Advanced NLP</i>	1
Spring 12	EECE-230 <i>Introduction to Programming</i>	23
	EECE-432 <i>Operating Systems</i>	22
	EECE-636 <i>Logic Synthesis & Verification</i>	9
	EECE-798E <i>Advanced NLP</i>	1
	EECE-502 <i>Final Year Project</i>	6
Semester	Course Title	Students
Fall 12	EECE-230 <i>Introduction to Programming</i>	34
	EECE-330 <i>Data Structures & Algorithms</i>	20
	EECE-637 <i>Advanced Programming Practices</i>	7
	EECE-501 <i>Final Year Project</i>	9
Spring 13	EECE-230 <i>Introduction to Programming</i>	28
	EECE-432 <i>Operating Systems</i>	23
	EECE-502 <i>Final Year Project</i>	9
Fall 13	EECE-230 <i>Introduction to Programming</i>	43
	EECE-330 <i>Data Structures & Algorithms</i>	34
	EECE-501 <i>Final Year Project</i>	9
Spring 14	EECE-636 <i>Logic Synthesis & Verification</i>	10
	EECE-432 <i>Operating Systems</i>	23
	EECE-502 <i>Final Year Project</i>	9
Fall14	EECE-231 <i>Programming C++ & Matlab</i>	32
	EECE-501 <i>Final Year Project</i>	6
Spring 15	EECE-502 <i>Final Year Project</i>	6
Fall 15	EECE-231 <i>Programming C++ & Matlab</i>	36
	EECE-330 <i>Data Structures & Algorithms</i>	19
	EECE-636 <i>Logic Synthesis & Verification</i>	9
	EECE-501 <i>Final Year Project</i>	15
Spring 16	EECE-432 <i>Operating Systems</i>	23
	EECE-502 <i>Final Year Project</i>	15

PROFESSIONAL

EXPERIENCE **American University of Beirut** Beirut, Lebanon February 2009current

Assistant professor, Electrical and computer engineering

My research and teaching duties are detailed above, for service see service section below

IBM Corporation , Austin, Texas USA, June 2001—Dec 2008

Lead of logic debug and structural verification tools

- Re-architected and optimized tools to handle real time data and interactive debug.
- Added new functionalities to the tools, many of which were patented as IBM inventions.

- The team works closely with tool users in an eXtreme Programming environment where users highly contribute to the design and fix process.
- I lead the XScope team. XScope is a logic visualization tool that offers an integrated debug environment for hardware logic designs. It is a multi-threaded and multi-processed application and uses many technologies such as C/C++, QT, and STL.
- I also lead the structural verification team. The team owns a suite of structural tools (Nemo, Arctic, and LockStep) that enable asynchronous verification within the IBM verification methodology. Member of the SixthSense team
- SixthSense is an IBM inhouse transformation-based verification framework used for (semi-)formal verification and sequential equivalence checking. I design and develop reduction and decision techniques and embed them into SixthSense

Member of the SixthSense team

- SixthSense is an IBM inhouse transformation-based verification framework used for (semi-)formal verification and sequential equivalence checking. I design and develop reduction and decision techniques and embed them into SixthSense.

Softdomain Incorporated, Piscataway, New Jersey USA, Apr. 1999—Jun. 2001

Senior software engineer

- Co-invented, designed and implemented Infowiz (www.infowiz.com) This is a multi-platform, multi-threaded message/execute framework that accepts realtime messages/commands on several data ports (SMS, POP3, SMTP, HTTP, IM, etc) and responds in kind in real time. (C/C++, POSIX, TCP/IP, Perl)
- I designed and built multi-platform and multi-threaded software packages that included kernel device drivers, dynamic web-based communication utilities, database and GUI interfaces using C/C++, Java, STL, TCP/IP, SQL, QT, and gtk++.

Sun Microsystems Incorporated, Piscataway, New Jersey USA, May 2001—Jun. 2001

I worked as a system level troubleshooting engineer for the BMG Music royalty system that featured technologies such as Sybase, SQL stored procedures, COBOL, cshell, and HP Unix.

Sun Microsystems Incorporated, Piscataway, New Jersey USA, Feb. 2000—Feb. 2001

I led the Sun Microsystems team that ported the AT&T Billing System (CADM) from HP/UX to Sun Solaris 2.6.

NetSilica Incorporated, Piscataway, New Jersey USA, Sep. 2000—Dec. 2000

I helped design and integrate a full portal system that offers internet disk space along with personalized web desktop for NetSilica. The project work involved technologies such as Visual C++, COM/DCOM, TCP/IP, Java servlets, Java applets, Windows shell programming, and Windows application programming.

Santa Cruz Operations Incorporated, New Providence, New Jersey, May 1999—Feb. 2000

I designed and implemented a new feature in SCO-Uxware 7.1 called world wide naming (WWN) or unique disk identifier. The module was released in the 7.1 kernel.

Sadess Technologies Incorporated, Beirut, Lebanon, Oct. 1998—Apr. 1999

Software Engineer Program Manager

- I was the main architect and programmer of Visual Floor (VF), an add-on CAD library/module to AutoCAD. VF uses AutoCAD functionality to help design and analyze concrete and steel structures from a floor map. Work involved technologies such as Windows NT, VC++, ARX, MFC, and ADO.

American University of Beirut, Beirut, Lebanon, Jun. 1996—Jul. 1998

Teaching assistant, network administrator, researching programmer

- I assisted teaching and taught lab sessions for digital signal and image processing and digital communication courses. I also taught computer literacy courses and C/C++ programming labs.
- I worked on developing arabization modules for windows such as a generic arabized edit box (Yaraah) and an Arabic enabled web browser (Fanous).

AWARDS

Farouk Jabr Award (2014), dbGap-CIDR NINDS access (2015), LDC Arabic Tree Bank access (2011), IBM Second lateau invention (2008), IBM Bravo awards (2003, 2005, 2006), IBM First invention award (2006), Dean's honor list 93-94-96

TALKS

- Invited to visit the US Office of Naval Research (ONR) Global in London, UK, on Friday, 30 October, 2015. "Information extraction of protein protein networks related to traumatic brain injury".
US Department of Defense.
- "Natural Language Processing at the American University of Beirut," Sussex Informatics NLCL, Sussex University, United Kingdom, August 2013.
- "Program Analysis and Logic Solvers," Lab for Automated Reasoning and Analysis (LARA), Ecole Polytechnique Federal de Lausanne (EPFL), Switzerland, Sep. 2010.
- "Sequential Logic Solvers for the Analysis of Imperative and Declarative Programs," Centre of Research in Computing, Open University, Melton Keynes, United Kingdom, July 2008.
- "Software Verification and Sequential Circuit Solver," University of Cambridge Research Lab, Microsoft Research, United Kingdom, Jun 2008.
- "Finite Models of Theories in Relational Logic," ACL2 Theorem Proving Seminar Series, UT Austin, July 2006.

SERVICE

- Department
 - Member, ECE Adhoc committee exploring a software engineering program, 2015-current
 - Member, ECE Ad-hoc Software committee, 2009-present
 - Academic Advisor, 2009-present
 - Member, ECE Graduate Student committee, 2012-2013, 2014-current
 - EECE seminar, Feb 2012-Sep 2014
 - Member, ECE Undergraduate Student committee, 2009-2011, 2013-2014
 - Proposed a minor in computational systems for non-ECE engineering students, Fall 2013
 - Organized a tech talk at AUB for Facebook university recruiting, Oct 2011
 - Secretary, 2010-2011
 - Member, ECE Summer internship committee, September 2009

Prepared and delivered the software lecture in the EECE 200 course in Fall 2010, 2011, 2012, and 2013.

- Faculty:

Adhoc committee on Entrepreneurship and Software Start-up
FEA Student conference reviewer
Member, extended Biomedical PhD Program committee
Represented AUB at the Eleventh LIRA conference 2014 with a candidate project.

- University:

Member, Computational science graduate programs, 2009-present
Member, Healthcare Leadership Academy-Information Technology training committee, Spring 2014
Represented AUB at the Arabic Open Source Tools UNESCO Workshop, February 2009.
Member of jury, AUBMC Biomedical research day, Feb 2014
FEA Faculty Observer, SRC Elections 09-current
Served on a dozen Masters thesis committees in ECE and CMPS

- Faculty and university IT initiatives

Upon joining AUB, I drafted an initiative with recommendations to the FEA-IT department to improve IT services for AUB professors at large. The initiative led to several improvements across AUB. Spring-Fall 2009.
Found and reported important security issues with AUB banner system that may compromise the grading system. Fall 2014.
Provided consultancy with recommendations to the IT committee that worked on resolving the reported AUB banner problem. Fall 2014.
Proposed and contributed with an FYP group several additional functionalities to the AUB Banner system that simplify schedule construction for students, registration bottlenecks for IT, and grade submission for professors. Some of the functionalities are being adopted in the system.

- Community and Profession

Program committee, International Conference on Software Testing, Verification and Validation (ICST 2016).

Organizing the first Arab Big Data Initiative, Aug 28-29, 2015, AUB, Beirut Lebanon. A MOSAIC-FP7 project activity.

Big data and health session chair, the first Arab big data initiative, Aug 28-29, 2015, Beirut Lebanon. A MOSAIC-FP7 project activity.

Reviewed papers at different IEEE/ACM journals and conferences on hardware and software verification (FSE, ICST, ISSRE, SAC, ICCAD, DAC, HRL, CHARME, DTC, WODA, TAICPART, ICCD, HVC, FMCAD, ASE, TLPL, VMCAI, JSS, TCAD), and information extraction (Frontiers, PlosOne, Frontiers, PlosOne, IJSWIS).

Reviewed Research Proposals for AUB University Research Board, and for the Lebanese National Council for Scientific Research.

Reviewed Research Proposals for Lebanese National Council for Scientific Research.

Reviewed Research Proposals for “Programme CEDRE”, Lebanese ministry of education and higher education.

Member, IBM Academic Initiative, 2012-current.

Elected Member of the [University Student Faculty Council \(USFC\)](#) at AUB 1997-1998

Elected Student Representative for the Faculty of Engineering and Architecture Students Representative Committee 1997

Elected Student Representative in the Engineering and Architecture Faculty Admission Committee 1997

Elected Student Representative in the University Scholarship Committee 1997

OPEN SOURCE PROJECTS. I provide most of the products and the corresponding source code that come out of our research in information extraction and automated correctness as open source products published on my webpage as well as public software repositories such as google code, bitbucket, and github. We provide information and maintenance services when possible in response to questions and requests. The latest information show dozens of downloads. We also receive more than a dozen feature requests and bug reports per year.

TECHNICAL SKILLS

<i>OS:</i>	Linux, Windows, AIX, HP, Solaris
<i>Languages:</i>	C/C++, JAVA, Matlab, R, SQL and familiar with Perl and Python
<i>Methodologies:</i>	OOP/OOD, Design patterns, Aspects, Design by Contract
<i>Middleware:</i>	STL, Qt, Motif, JBOSS, CORBA, ADO, ODBC, COM/DCOM, SDK, JFC, MFC
<i>Internet:</i>	UNIX and Windows web and proxy server, Java Applets, JavaScript, CGI, ActiveX, TCP/IP
<i>Applications:</i>	T _E X, L _A T _E X, B _I B _T E _X , Microsoft Office, Lotus SmartSuite, and common productivity packages
<i>Tools:</i>	Vim/Emacs and command line UNIX development tools, GNU Make, Eclipse, Visual Studio, Source code control (hg, git, svn, Clearcase, CMVC), Sun Workshop

MISCELLANEOUS

<i>Languages:</i>	Read, write and speak Arabic, English, and French
<i>Interests:</i>	Soccer, Chess, literature and poetry, write Arabic poetry and short stories