Rachid Hadjidj, Ph.D.

Personal Details

Name	Rachid Hadjidj
Citizenship	Canadian
Current position	Assistant Professor at Qatar University, Department of Computer Science and Engineering.
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WebPage	http://qufaculty.qu.edu.qa/rhadjidj/

Research Interests

- Real time systems Modeling and Verification
- Data Mining and Visualization
- Image processing & Machine learning
- Computer forensics
- Computer security & Networking
- Bioinformatics

Education

Sep. 2002 – Feb 2006	**Ph.D. in Computer Engineering** **Institution**: University of Montreal (Ecole Polytechnique), Montreal, Canada **Thesis**: Formal validation of real time systems
Sep. 1991 – Jun. 1994	**M.Sc. in Computer Science** **Institution**: University of science and technology Houari Boumedienne (USTHB), Algeria **Thesis**: Dynamic Graphs: A new paradigm for parallel and distributed computations
Sep. 1985 – Jun. 1990	**Engineering Degree in Computer Science** **Institution**: University of science and technology Houari Boumedienne (USTHB), Algeria **Project**: A Multimedia tutoring system

Publications in International Journals

1. Ben Said, A. **Hadjidj, R.** Foufou. S., K.E. Melkemi (2016). Multispectral image denoising with optimized vector non-local mean filter, Digital Signal Processing Journal, Elsevier, Volume 58, November 2016, Pages 115–126

2. Ben Said, A. **Hadjidj, R**. Foufou. S. (2015). Cluster validity index based on Jeffrey divergence, Pattern Analysis and Applications Journal, Springer London

3. **Hadjidj, R**. and Boucheneb, H. (2011). Efficient reachability analysis for time Petri nets. IEEE Transactions on Computers, IEEE, vol.60, no.8, pp.1085-1099

4. **Hadjidj, R**. and Boucheneb, H. (2009). On the fly TCTL model checking for time Petri nets. Theoretical Computer Science. TCS, Elsevier, 410(42): 4241-4261

5. **Hadjidj, R.** and Debbabi, M. Lounis, H. Iqbal, F. Szporer, A. Benredjem, D. (2009). Towards an integrated email forensics analysis framework. Digital Investigation 5(3-4): 124-137.

6. **Hadjidj, R**. and Boucheneb, H. (2008). Improving state class constructions for CTL* model checking of time Petri nets. International Journal on Software Tools for Technology Transfer. STTT, Springer, 10(2): 167-184.

7. Iqbal, F. **Hadjidj, R**. Fung, B. C. M. and Debbabi M. (2008). A Novel Approach of Mining Write-Prints for Authorship Attribution in E-mail Forensics. Digital Investigation, 5(1):42-51.

8. Boucheneb, H. and **Hadjidj, R.** (2008). Model Checking of Time Petri Nets, Petri Net, Theory and Applications, Book edited by, ISBN 978-3-902613-12-7, pp. 534.

9. Boucheneb, H. and **Hadjidj, R**. (2006). CTL* model checking for time Petri nets. Theoretical Computer Science, 353(1-3), 208–227.

10. Boucheneb, H. and **Hadjidj, R**. (2006). Using inclusion abstraction to construct atomic state class graphs for time Petri nets. International Journal of Embedded Systems, Inderscience, V 2, No.1/2, 128–139.

Submited

11. **Hadjidj, R**. and Hadjidj, D. (2016). Model-Checking Zenoness for Real Time Systems. Formal Methods in System Design, Springer.

12. Chkirbene, Z. **Hadjidj, R**., Foufou, S. Hamila, R. (2017), LaScaDa: A Novel Scalable Topology for Data Center Network, IEEE Transactions on Network and Service Management. IEEE

13. Besaid, A. , **Hadjidj, R**. and Foufou, S. (2017), Total variation for Computer Tomography image denoising based on novel edge detector, IEEE Transactions on Medical Imaging, IEEE

Publications in International Conferences

1. A. BenSaïd, S. Foufou, **R. Hadjidj** (2015) Vector anisotropic filter for multispectral image denoising. The International Conference on Quality Control by Artificial Vision 2015, 95340N-95340N-8, Le Creusot, France.

2. A. BenSaïd, **R. Hadjidj**, S. Foufou (2014) Gravitational weighted fuzzy c-means with application on multispectral image segmentation. 4th International Conference on Image Processing Theory, Tools and Applications, IPTA'14, Paris, France.

3. A. Ali, R. Jia, A. Erradi, S. Abdelwahed and **R. Hadjidj**, (2013)Towards Model-based Management of Database, 8th International Workshop on Feedback Computing, June 25, San Jose, CA USA

4. **Hadjidj, R** and Boucheneb, H. (2013) RT-Studio: A tool for modular design and analysis of realtime systems using Interpreted Time Petri Nets, International Workshop on Petri Nets and Software Engineering, PNSE'13, Milano, Italy.

5. R. Jia, S. Abdelwahed, A. Erradi, **R. Hadjidj** and A. Ali (2012), "A Model-based Framework for Automatic Recovery from Incipient Faults in Computing Systems", The 7th International Workshop on Feedback Computing, San Jose, CA, USA.

6. Charpentier. R, Debbabi. M, D. Alhadidi, M. Azzam, N. Belblidia, A. Boukhtouta, A. Hanna, **R.Hadjidj**, H. I. Kaitouni, M. A. Laverdière, H.Z. Ling, S. Tlili, X. Yang, and Z. Yang (2010) Security Evaluation and Hardening of Free and Open Source Software (FOSS), 4th International Workshop on Foundations and Techniques for Open Source Software Certification.

7. Tlili, S. Yang, X. **Hadjidj, R**. Debbabi, M. (2009) Verification of CERT Secure Coding Rules: Case Studies, IS'09 the 4th International Symposium on Information Security, Algarve-Portugal.

8. **Hadjidj, R.** Yang, X., Tlili, S. Debbabi, M. (2008) Model-Checking for Software Vulnerabilities, PST2008 the Sixth Annual Conference on Privacy, Security and Trust, New Brunswick, Canada, 133-142

9. Iqbal, F. **Hadjidj, R.** Fung, B. C. M. and Debbabi M. (2008). A Novel Approach of Mining Write-Prints for Authorship Attribution in E-mail Forensics. In Proceedings of the 2008 Digital Forensic Research Workshop, Baltimore, MD: Elsevier, S42-S51.

10. Boucheneb, H and **Hadjidj, R**. (2007). Model checking real time systems. VECoS'(2007).

11. **Hadjidj, R**. and Boucheneb, H. Hadjidj, D. (2007). Zenoness detection and timed verification of real time systems. VECoS'(2007).

12. **Hadjidj, R**. and Boucheneb, H. (2006). On the fly TCTL model checking for time Petri nets using the state class method. In Proc of the Sixth International Conference on Application of Concurrency to System Design (ACSD'06), IEEE Computer Society Press), Finland, 111–120.

13. **Hadjidj, R**. and Boucheneb, H. (2005). Much compact time Petri net state class spaces useful to restore CTL* properties. In Proc. of the Fifth International Conference on Application of Concurrency to System Design (ACSD'05). IEEE Computer Society Press, Rennes, France, 224–233.

14. Boucheneb, H. and **Hadjidj, R**. (2004). Towards optimal CTL* model checking of time Petri nets. In Proc. of the International Workshop on Discrete Event Systems (WODES'04). Reims-France, 469–474.

Awards

2006: Post-doc scholarship in Canadian Government Laboratories from NCERC

2009: Received the OCTAS 2009 award on the project: Evaluation and Reinforcement of the security of open source software: a synergy between Aspect oriented and security patterns

Grants

2016-2019: NPRP9-224-1-049: Spatio-Temporal Composition of Sensor Cloud Services ($717,839.00)

2010-2011: UREP 08- 029 - 1 – 007: Mining Write-Prints for Authorship Attribution in E-mail Forensics ($29,200.00 $)

2010-2014: NPRP 09-778-2-299: Fault adaptive performance management ($816,627.25)

2011-2015: NPRP 4 - 1165 - 2 - 453 : Advances in Biometrics via Narrowband Multispectral Imaging ($831,285.23 $)
2012-2013: Qatar university Students Grant (10000Qr)

2013-2014: Qatar university Students Grant (10000Qr)

2014-2015: Qatar university Students Grant (10000Qr)

2015-2016: Qatar university Students Grant (10000Qr)

Some research and development projects

2006-2008: Projects with the Canadian National Defense.

Project 1: Coalition Warrior Interoperability Demonstration, 2008 (CWID'08) with Defense Research and Development, Canada–Valcartier (DRDC).

**Role:** Senior software solution architect and user interface analyst.
Tasks:
1. Participated in designing CWID '08 client-server software application for military command and control.
2. Participated in designing and developing the software user interface of the client prototype.
3. Participated in database, web-service development.
4. Participated in the integration of various databases (Oracle, Sybase, etc.) and several remote web services to the application server and provisioned accessing them from CWID client application.
5. Programmed using J2EE, JMS, JPF, XML, WSDL, Apache Geronimo, Oracle, Sybase, Eclipse, etc.
6. Involved in high-quality document writing associated to the CWID'08 execution.

Project 2: Total Resource Visibility Project (TRV- Project) as a part of JCDS 21 standing offer contract with Defense Research and Development, Canada –Valcartier (DRDC).

    Role: Senior software solution architect and user interface analyst.

Tasks:
1. Participated in Designing the software user interface of TRV-Prototype (see next picture)..
2. Worked with DRDC-Professionals to understand the military requirements of assets visualization, data analysis and military logistic operations.
3. Participated in rapid prototyping of TRV- Prototype to reflect planning of military logistic operations on a geographic information system.
4. Participated in developing an advanced geographic information system (GIS) for the military assets visualization.
5. Programmed using Java, XML technologies, Eclipse and Netbeans Editor, etc.
6. Participated in Building all the user-interface using Java IDEs (Eclipse and Netbeans).
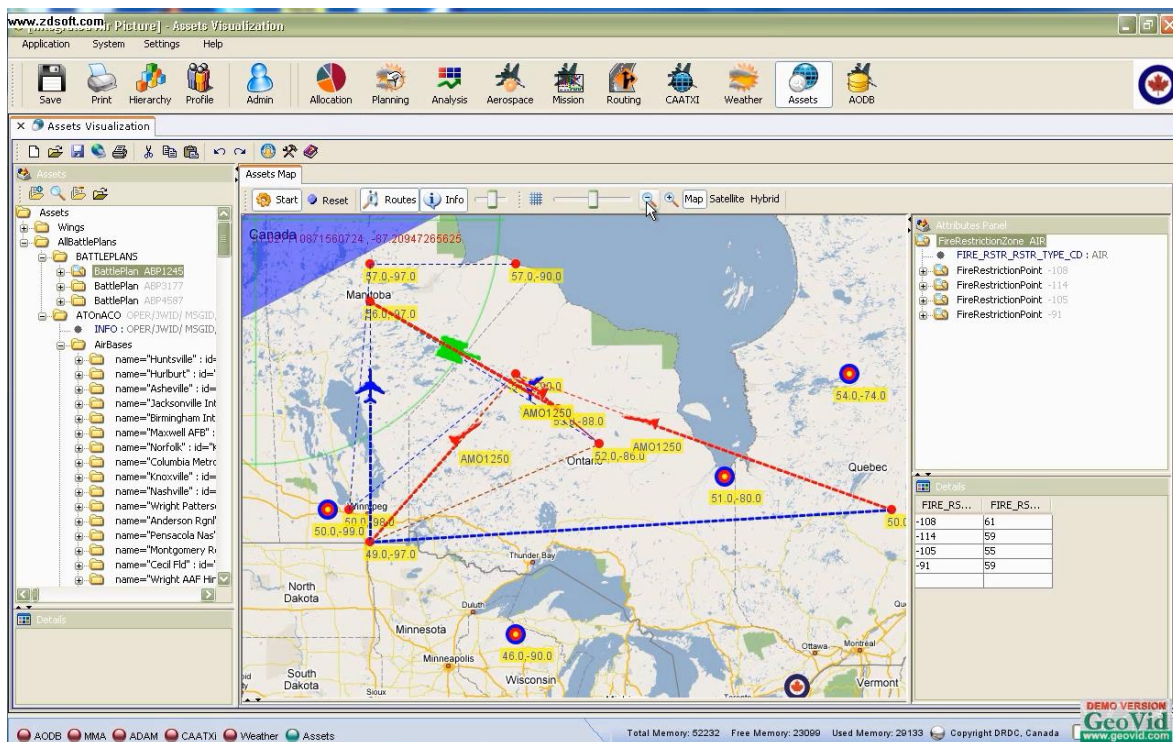
Project 3: Network Centric Distributed and Continual Planning Project (NCDCP- Project) with Defense Research and Development, Canada –Valcartier (DRDC).

    Role: User interface analyst, military command and control analyst, senior developer.

Tasks:
1. Contributed to the development of "Digital Cockpit" concept for military mission command and control in this project.
2. Participated in designing and developing a middleware to support decision making in network-centric environment.
3. Involved in designing and prototyping plug-in based software application where software modules can be added in run-time.

4. Worked on several cutting-edge software technologies, including Java plug-in framework, web-service composition, XML technologies, geographic information systems, etc.
5. Integrated various remote Java Web Services from a software application. Programmed using Apache Geronimo Server, Apache Tomcat Server, Oracle, Sybase, SOA, JMS, Java, JPF, XML, JavaScript, WSDL, BPEL, Eclipse, NetBeans, etc.

2007: A model checker for cryptographic protocols: The model checker uses a game theoretic approach to verify security flaws in cryptographic protocols.

2007: A verification tool for finding security bugs in open source software: The tool uses a push down system model checker to check violation rules that can be expressed as temporal safety properties. A temporal safety property is expressed as a transition system that dictates the order of a sequence of operations (see next picture)..
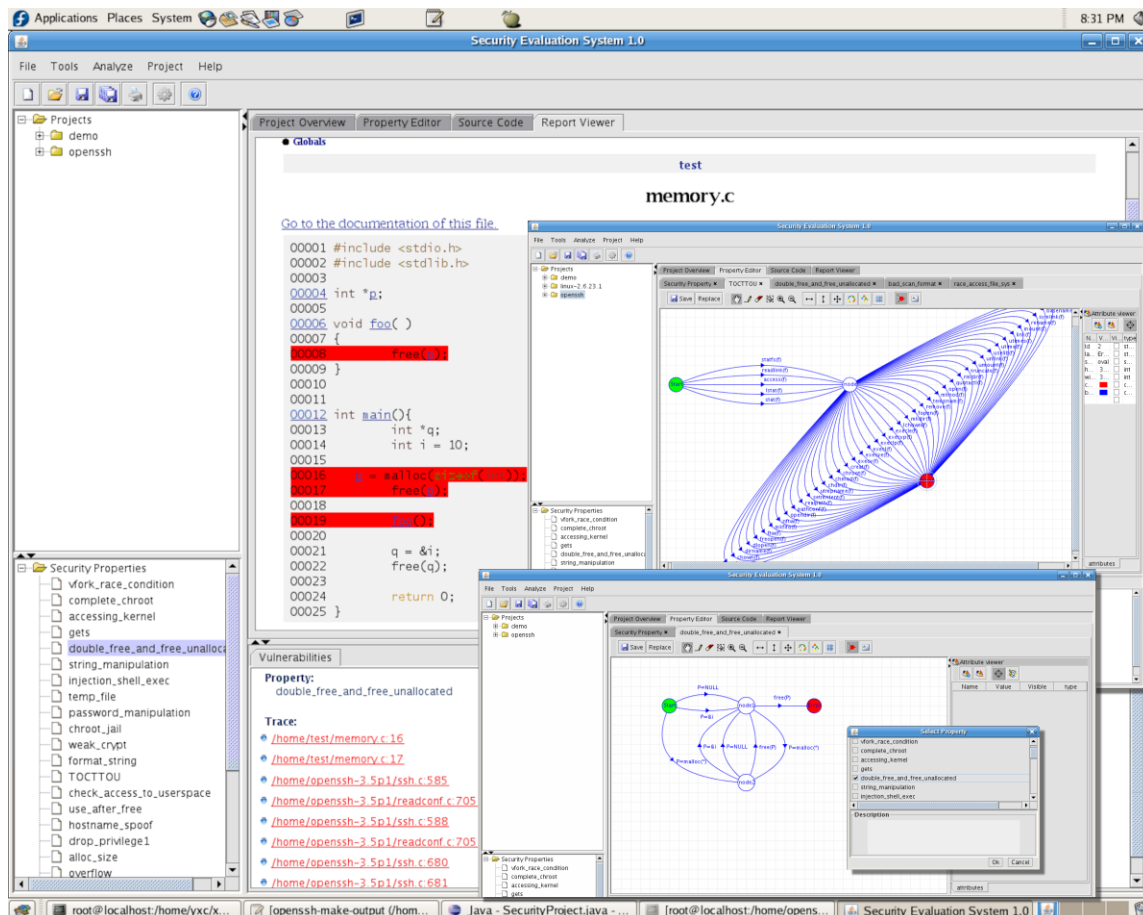
2007: An integrated Email forensics analysis framework: The framework implements advanced functionalities like statistic analysis, data mining, social networks, and geographic localization for a multi-staged analysis of an email corpus, to help forensic investigators collect clues and evidence (see next picture).
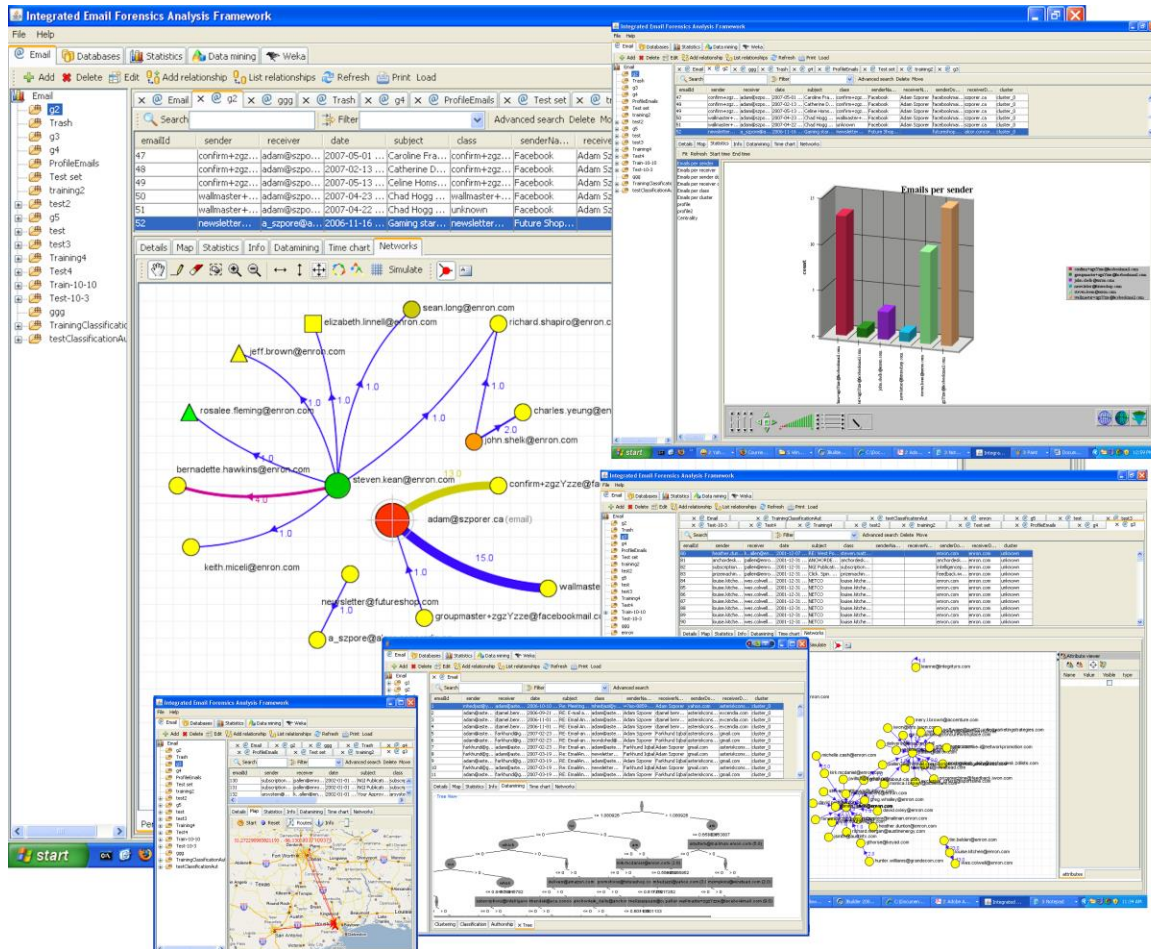
2003-2004: A tool for UML validation: The tool allows to verify a UML design against an OCL specification, and automatically generates Java code for both system and software quality assurance.

2002: **A tool for telecommunication networks visualization and performance analysis**: The tool called "Graph-Lab", allows the graphical designing of a telecommunication network and its analysis.

1993-1997: An object oriented relational data base system: The system called "New Database Vision" (NDV) is in half way between a relational and an object oriented database system. NGV proposes an original approach for a rapid development of database applications with several interesting features, such as: semi graphics interfaces, all time customizable and self repair applications, with visual programming capabilities. The system handles more than 13 data types (int, float, radio button, checkboxes ...), supports views, report generation and more. More than 10 applications have been developed using NDV and commercialized.

1999-2000: A self learning general purposes troubleshooter (expert system): The system, developed with CLIPS, can be taught by an expert in any field, and then used to solve problems in that field.

1989-1990: A Multimedia tutoring system: The system is an integrated environment, offering a graphics tool, a multi-text editor, a music editor and a Pascal-like programming language to develop electronic courses, tutorials and presentations.

1998-1999: An implementation of the fast Fourier transform using Transputers: The application is written in the language Occam, and can be set to run on different configurations of transputers.

1999-2000: A cross language internet search engine: The search engine uses a spider with a specific weighting technique to index the Internet, and a dictionary to retrieve results in several languages.

1994-2001: Others: Development of games and several scientific applications in deferent fields including: fuzzy logic, 3D Graphics, image and signal processing, probability and statistics, programming languages, artificial intelligence, operation research, graph theory, etc.

Abstracts of some contributions

- **Hadjidj, R**. and Boucheneb, H. (2011). Efficient reachability analysis for time Petri nets. IEEE Transaction on Computers, vol.60, no.8, pp.1085-1099

  Abstract
  We propose in this paper some efficient approaches, based on the state class graph method, to construct abstractions for the Time Petri Net (TPN) model, suitable to verify its linear or reachability properties. Experimental results have shown that these abstractions are very appropriate as both time and size are considerably reduced. For some tested models, abstractions that preserve reachability properties can be as many as 2,051 times smaller and more than 592 times faster to compute. For abstractions, which are over approximations (useful to prove that certain states are not reachable), gains can overpass 10,000 for both time and size

- **Hadjidj, R**. and Boucheneb, H. (2008). Improving state class constructions for CTL* model checking of time Petri nets. International Journal on Software Tools for Technology Transfer. STTT 10(2): 167-184..

  Abstract
  The state space explosion is still one of the most challenging problems in formal verification using enumerative techniques. The challenge is even greater for real time systems whose state spaces are generally infinite due to time density. To use enumerative techniques with these systems, their state spaces need to be contracted into infinite structures that preserve properties of interest. We propose in this paper an efficient approach to construct a contraction of a real time system state space, which preserves its CTL* properties.

- **Hadjidj, R.** and Boucheneb, H. (2009). On the fly TCTL model checking for time Petri nets. Theoretical Computer Science. TCS 410(42): 4241-4261

  Abstract

In this paper, we show how to efficiently model check a subset of *TCTL* properties of a real time system, modeled as a time Petri net (TPN), using the state class method. The verification proceeds by augmenting the model of the real time system under analysis with a special model, called *Alarm-clock*, to allow the capture of relevant time events. A forward on-the-fly exploration is then applied on the resulting model's state class space to verify a timed property. A relaxation operation on state classes is also introduced to further improve performances. *Alarm-clock* is the same for all properties, whereas the exploration technique is not. Three exploration techniques are presented to cover most interesting TCTL properties. We prove the decidability of our verification technique for bounded TPN models and compare it with the reachability algorithm implemented in the tool UPPAAL. Finally, we give some experimental results to show the efficiency of our verification technique.
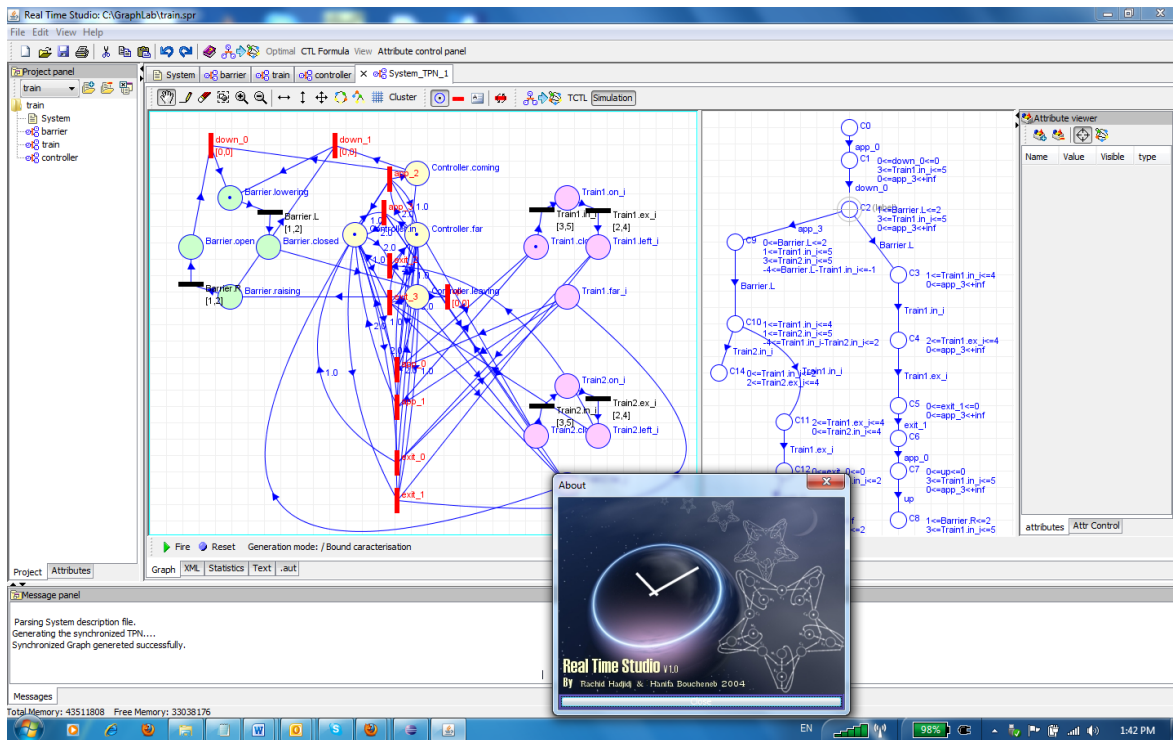
PhD Thesis details

Title: Formal validation of real time systems
Thesis supervisor: Hanifa Boucheneb (Professor at the computer engineering department of l'Ecole Polytechnique of Montreal (University of Montreal)
Defense Date: Feb 2006

Abstract
In this thesis, we are interested in real time systems, for which we propose some effective approaches to verify their timed and untimed properties. The retained verification technique is model-checking. Since the state space of a real time system is in general continuous and infinite, mainly due to the continuous nature of time, the application of model-checking requires an additional abstraction step to generate a discrete and finite abstract state space of the system. This state space must also preserve the properties of interest. From the point of view of untimed properties verification, our contributions are rather propositions to attenuate the state explosion problem. We start by defining a formal framework to characterize an abstract state model of a real time system vis-à-vis the properties it preserves, then we propose some abstract state models that preserve reachability, linear and branching properties. These properties can then be verified using classical model-checking methods. Furthermore, we show that our formal framework is more appropriate than the one proposed in the literature to characterize known abstractions of real time systems. For timed properties, we propose a temporal logic, and give its formal semantic, then we propose a forward on-the-fly verification technique, based on the so called state class method, and prove its decidability for all bounded Models. To evaluate our approach, we compare it to the reachability algorithm implemented in the tool Uppaal. In average, we can verify models 7 times faster than Uppaal, with lesser memory usage. For certain properties, the verification is more than 4000 times faster, with 110 times lesser memory usage. To validate our approaches we implemented them in our tool called Real-Time-Studio (see next picture).

Master Thesis Details

Title: Dynamic Graphs: A new paradigm for parallel and distributed computations
Supervisor: Professor Ainouche Ahmed (Professor at the university of Antilles and Guyane, France)
Defense Date: June 1994

Abstract

In this thesis, we propose a new paradigm for parallel and distributed computations we call "Dynamic Graphs". A Dynamic Graph is in its structure similar to a graph of graph theory, with the possibility to associate dynamic sets of properties and behaviors to its arcs and vertices. A message queue is also associated with each arc and vertex of a dynamic graph for an asynchronous communication between its components. Through these possibilities, all components of a graph become active and can be set to participate together to solve problems in a parallel and distributed way by sending messages and messengers. A messenger is a message associated with a behavior. More than carrying simple information, a messenger can perform actions where ever it is sent, according to a well established set of rules. Typical actions of a messenger are: sending itself to specific destinations, inserting itself in the set of behaviors of the entity it has reached and change its properties, duplicate itself, destroy itself, etc. The paradigm is mainly inspired from biological activities in live organisms and can be seen as an actor model too. A tool called "New Graph Vision" (NGV), based on Dynamic Graphs, was designed and implemented in C++ under Windows. NGV has the structure of a graph editor, where the user can draw a graph and define, in a specific language, properties and behaviors for each vertex and link. The graph becomes dynamic and can be started for execution as if it was a distributed network of computers. The tool allowed us to propose some algorithms to solve problems related to networking and graph theory in an original way. Problems such as the coloring and the salesman

problem, and systems such as Petri nets, neural networks, network protocols where treated successfully.

Research Interests

With the advance in technology, systems grow in complexity and become increasingly difficult to develop, verify and maintain. Real time systems are a category systems which behaviors take also into account timing constraints. These systems are in general concurrent, distributed and more difficult to construct and validate. In this context, formal methods are strongly recommended since they rely on sound mathematical bases. Formally verified systems enjoy a high degree of confidence, which allows their designers to be more persuasive when it comes to convince deciders for their installation.

My PhD research goal was to develop formal verification techniques to help construct more safe and reliable real time systems and telecommunication protocols. For this, several mathematical formalisms have been investigated and the Time Petri Net model (TPN model) was retained for its power to model both concurrency and timing constraints in a concise and natural way. However, the model has serious drawbacks when it comes to verification due to a lack of research in this field. The objective of my research was to overcome this limitation by proposing efficient approaches to verify timed and untimed properties of real time systems using model-checking techniques. Since the state space of a real time system is in general continuous and infinite, model-checking application requires an additional abstraction step to generate a discrete and finite abstract state space. This state space must also preserve properties we want to verify. For untimed properties, my contributions are propositions to attenuate the state explosion problem. I started first by defining a formal framework to characterize an abstract state model vis-à-vis the properties it preserves, then proposed some abstract state models for a real time system that preserve its reachability, linear and branching properties. These properties can then be verified using classical model-checking methods. For timed properties, I defined a temporal logic and proposed a forward on-the-fly verification technique, based on the so called state class method, then I proved its decidability for all bounded TPN Models. To evaluate the performance of my verification approach, I compared it with the model checking technique implemented in the tool UPPAAL which verifies timed automata modes. In average, I was able to verify TPN models more than ten times faster than UPPAAL for equivalent timed automata models, and with much lesser memory usage. For certain properties, the verification is more than 3400 times faster, with 110 times lesser memory.

Another outcome of my PhD work was Real Time Studio, a tool to model and verify real time systems. The tools allows for a modular design of real time systems using interpreted time Petri nets, and implements all my proposed approaches and several other functionalities related enumerative analysis of real time systems, including CTL, LTL, and TCTL model checkers, and a minimizer under bisimulation. The tool is under constant improvement and several extensions are expected, to widen the scope of its use. Two of these extensions are already in progress; one of them is related to the formal verification computer security, the other one deals with bioinformatics for the simulation of bio-pathways using Hybrid functional Petri Nets (see next picture).
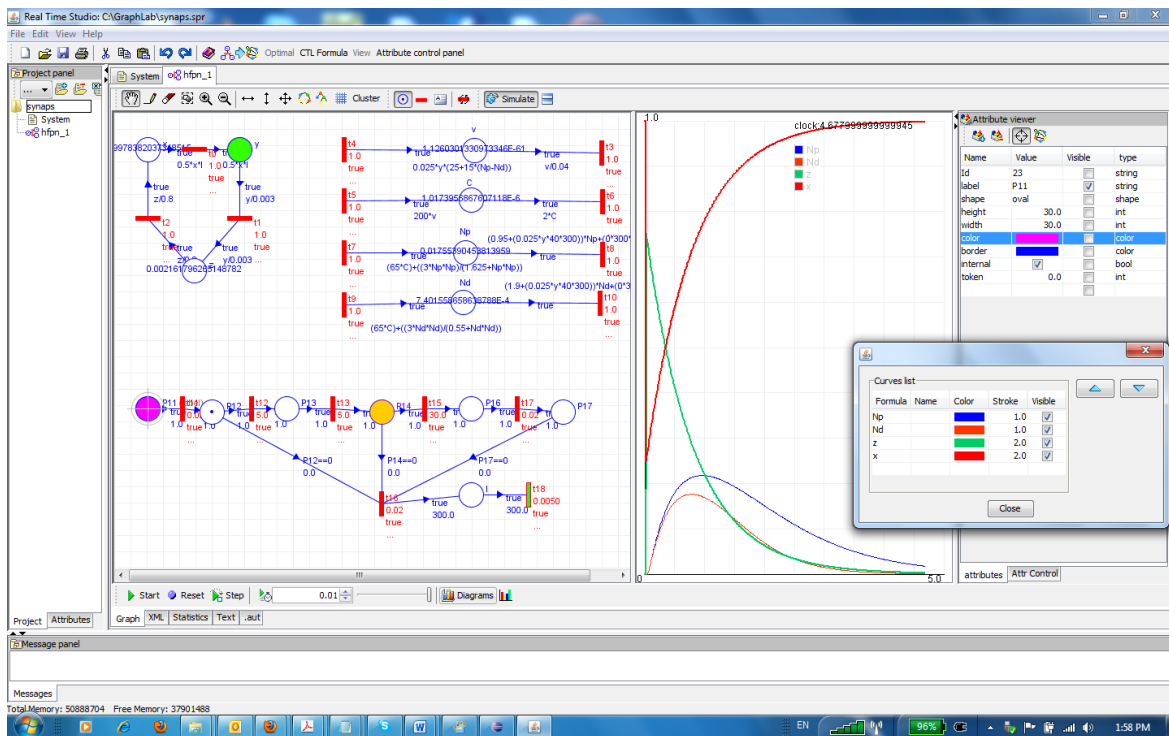
Future Research

In the computer Security field, I am interested in developing new techniques and tools to verify security properties in open source software application using, mainly push down systems model-checking techniques. In computer forensics, I am interested in developing new techniques and tools to detect malicious activities in communication networks (including wireless networks), like Botnets detection and tracking, and authorship attribution in emails and instant messages. In Image processing I am interested in identifying new modalities for person identification based on multispectral image analysis.

In formal verification, I am interested in developing modular verification techniques for real time systems. These techniques attempt to overcome the state explosion problem inherent to model checking technique, by exploiting the modular structure naturally present in most system designs. Some approaches have already been proposed in the literature where partial order techniques are adapted to timed models. However the results are still not satisfactory to deal with industrial size modes. In parallel, I intend to explore how the verification techniques I proposed can be used to verify security properties for real time systems and cryptographic protocols, using timed extensions of Petri nets, process algebra and timed automata. The application of formal methods to hardware verification is another topic of real interest to me.

On another front, the application of formal methods in bioinformatics seems very promising. The simulation of bio-pathways using Hybrid functional Petri Nets has already proven very effective, and the implementation of such possibility in my tool Real time studio, would certainly open the door for reach collaborations with scientist in that field.

Academic Experience

Since 2009: Assistant Professor, Dept of Computer Science and Engineering, Qatar University. Teaching several courses: Performance evaluation of computer systems, Modeling and simulation, Computation theory, Discrete structures for computing, Compilers construction, Digital image processing, Computer Networks, Data structures, Computer programming discrete structures for computing.

2007-2008: Postdoctoral fellow at Concordia University (Canada). Working on two main projects: Detecting security breached in open source software and Email forensics.

2002-2006: Research Assistant at "l'Ecole polytechnique de Montréal". Working on the the development of a tool for the formal verification of real time systems

2003-2004: Research Assistant at "l'Ecole Polytechnique de Montréal". Working with Professor John Mullins, on a research project about UML formal verification and Java code automatic generation, for both system and software quality assurance.

2004: Teaching assistant at "l'Ecole polytechnique de Montréal". Teaching the course INF6603: "Verification or real time systems". Co-supervision of 3 Master degree projects.

1997-2001: Instructor at the University of Qatar. Teaching several courses: algorithms and data structure, object oriented programming, logic design and computer architecture, computer organization, system programming, advanced database using Oracle, C++, Java, Pascal, assembly language, Unix, introduction to computer science (Ms Windows, Word, Excel, Access). Hardware and software installation and troubleshooting. Supervision of 3 senior projects.

1994-1997: Lecturer at the USTHB (University of Sciences and Technology Houari Boumedienne). Teaching operating systems. Supervision of 9 senior projects (Engineer: 5, Senior technician: 4).

1991-1992: Part time replacement lecturer at the USTHB. Teaching logic design and computer architecture.

Teaching

Fall_2012, Spring_2012, Spring_2013: Computer Programming, Qatar University.

Fall_2014, Fall_2015 : Programming Concepts, Qatar University.

Spring_2015 : Objec-Oriented Programming, Qatar University.

Fall_2009, Fall_2013: Automata & Formal Language, Qatar University.

Fall_ 2010 : Modeling & Simulation , Qatar University.

Fall_ 2010 : Data Structures , Qatar University.

Spring_2009 : Computer System Performance Evaluation, Qatar University.

Fall_2011: Compilers construction, Qatar University.

Spring _2011: Fundamentals of Digital Image Processing , Qatar University.

Sprint 2004 : Verification or real time systems , Ecole Polytechnique de Montreal

1995-1997: Operating Systems, USTHB Algeria

1994: Digital Logic: USTHB, Algeria

Supervisions

Ph.D. Theses

2009-2011: Farkhund Iqbal, Messaging Forensic Framework for Cybercrime Investigation, Concordia University, Canada (Co-Supervisor).

2009: Serine Tlili, AUTOMATIC DETECTION OF SAFETY AND SECURITY, Concordia University, Canada (Co-Supervisor).

Master Theses

2015-present: Imene Noureddine Mecheter, Modeling and simulation of biological pathways using the Hybrid ITPN formalism (Main Supervisor)

2013-2014: Ashraf Abu-Alia, ETECTING MALICIOUS DOMAINS USING LEXICAL CHARACTERISTICS, Qatar University, Department of Computer Science (Main Supervisor)

2013-2014: Nizar Ismail Alhawajreh, FORMAL VERFICACTION OF WORKFLOW PROCESSES USING TIME PETRI NET, Qatar University, Department of Computer Science (Main Supervisor)

Senior Projects:

2009 : Email Authorship attribution in cyber Forensic, Qatar University (Main Supervisor)
2010 : Rotating LED Display, Qatar University(Main Supervisor)

2012 : A mini rover for landmine detection and charting, Qatar University(Main Supervisor)

2013 : Mini Rover Robot for Harsh Environments , Qatar University(Main Supervisor)

2014 : Cuddles: Therapeutic interactive robotic teddy bear for Autistic children, Qatar University (Main Supervisor)

2015 : A robot system for real-time remote home monitoring, Qatar University(Main Supervisor)

1994 : NDV: New database vision. An object oriented data base systems, USTHB (Main Supervisor)

1996 : A simulation tool for the modeling and simulation of distributed processing, USTHB (Main Supervisor)

Professional Services

2014- present: Senior project Coordinator. In charge of all duties related the senior project course management including: managing the senior project website, students orientation and advising, senior project day preparation and presentations scheduling, Qatar University.

2014 – present: Course Project Award committee member, in charge of organizing the event and Judging projects, Qatar University.

2014 –present: Computer science contest committee member, Qatar University.

2014 – present: Robotics Contest committee member, in charge of organizing the event and Judging participating teams, Qatar University.

2016 – present: CMPS 205 course coordinator, Qatar University.

2016 – present: Students Social committee member, Qatar University.

2015 – 2016: CMPS 151 course coordinator, Qatar University.

2009 – 2016: Participated in the department seminars program by giving several talks about the formal verification of real time systems and email mining to graduate students.

2015 – 2015: GENG 106 restructuring committee member, Qatar University.

December 2014: Organized a workshop for the Computer science and Engineering department students to familiarize them with the topic of senior project course and answer their questions. The workshop was requested by the students advising office at Qatar University.

2012-2014: Students outreach committee member. Preparing brochures and participating in schools visits, Qatar University.

2013 – 2013: CS curriculum restructuring committee member, Qatar University.

2012 –2013: Computer science contest committee member, Qatar University.

2011- 2013: Coordinator for the course GENG 106, Qatar University.

2011- 2013: CRU committee member, Qatar University.

2011- 2012: Students Relations and recruitment Committee: - organized School visits - prepared and gave presentation a brochure and CDs - organized 15 visits to the foundation students. Qatar University.

2010 – 2012: Textbooks requisition Coordinator, Qatar University.

Community Services

September 2016: Reviewer for "The International Conference on Embedded Systems in Telecommunications and Instrumentation" 2016. Reviewing of 5 papers.

March 2016: Evaluated and judged 8 Students research projects at the second educational forum and the 7th students research exhibition 2016 (Doha Qatar).

March 2016: National Eigth Robotics Tournament-First Lego League (Doha, Qatar). Judge.

2010- present: Reviewer for International Multi-Conference on Complexity, Informatics and Cybernetics. Review of several papers.

December 2015: First GCC Robotics Challenge, Qatar Round. Judge.

March 2015:   The sixth students research exhibition 2015 (Doha, Qatar). Judge and Examiner: Evaluated and judged 12 Students research projects.

April 2015: IEEE Reviewer. Review of a journal papers For IEEE Transactions on Control Systems Technology.

March 2015: ICT Qatar Task Force member. Participated in a 2 day roundtable organized by ICTQatar on preparing Qatar's youth to fully engage in and lead their evolving digital society and to craft a Framework for Digital Youth for Qatar.

November 2014: PC member and Workshops Coordinator for AICCSA 2014: The 11th ACS/IEEE International Conference on Computer Systems and Applications. Doha, Qatar.

October 2014: Reviewer for the "International Conference on Computer Systems and Applications AICSA2014 " , Reviewing 3 papers.

March 2014: Gave a talk about Computer Forensics for master students. Military faculty, Doha, Qatar.

January 2014: Evaluated and judged 8 Students research projects for the second educational forum and the sixth students research exhibition 2014 (Doha, Qatar).

December 2013: Evaluated and judged 12 Students research projects at Al Bayan Educational Complex (Doha, Qatar).

2009-2011: ICT QATAR Satellite program committee. Planning requirements.

February 2011: Carnegie Mellon Qatar Reviewers committee. Reviewing 3 papers.

Industrial Experience

2009-2010: Consultant at ICTQatar, Qatar. Working on the new Qatar satellite program.

2006-2008: IT Consultant for the Canadian National Defense. Working on a research and development project about continual distributed planning for the Canadian National Defense (Digital cockpit).

2002: Software consultant at "l'Ecole Polytechnique de Montréal". Working with Professor Brunilde Sansò on the design and implementation of a tool for telecommunication networks visualization and performance analysis.

1999-2001: Software consultant at the endowments ministry computer center of QATAR. Development of several web applications using PLSQL, Javascript and Oracle application server. Design and implementation of a multi-language Web counseling application using Java Servlets, Oracle database and Apache web Server.

1998-2000: Software consultant at Infogulf.net, Doha, Qatar. Development of several websites. Development of an e-commerce web application using Java.

1995-1997: Software development engineer at Techno Format, Algeria. Development of several database applications.

IT Knowledge

Programming Languages	C/C++, Java , Visual Basic, PL/SQL, Borland Pascal, CLIPS, Prolog, Lisp, perl, Haskell, Occam
Modeling Languages	UML, Merise
Web Languages and Technologies	HTML, JavaScript, VbScript, XML, SOAP
Applications Programming Interfaces	MFCs, JDBC, Swing, JMF, AWT, Turbo Vision, EJB, Servlets, Quadbase
Integrated Development Environments	Eclipse, JBuilder, Netbeans , Visual C++, C++ Builder, Visual Basic, JDeveloper + Oracle Application server + Oracle developer, Delphi
Other Environments	PaintShop, FrontPage, Interdev
Application Servers	Apache Geronimo, Apache Tomcat
Operating Systems	Unix, Linux, Windows
Database Management Systems	Oracle, Access, Sybase, MySQL, NDV

Some References

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Other references are available upon request,