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PhD in Computer Science, experience in design and development of IT Systems

PROFESSIONAL EXPERIENCE

- 2002 – 2003 National Research Institute in Computer Science and Automation (INRIA)**
Research Engineer: developments in C, Java, C# and .NET CIL around Bigloo, an optimizing compiler for a functional language derived from Scheme: new .NET back-end, Win32 port, etc.
- 2002 – 2003 Computer Science Engineering School (ESSI)**
Teaching Assistant: lectures and tutorials.
2nd years: graphical interfaces with AWT/Swing, network-oriented developments in C and Java, network administration under Linux.
3rd years and post graduate degrees (*DESS*) in CS: advanced C++.
3rd years and PhD (*DEA*): synchronous reactive development (Esterel, Lustre).
- 1999 – 2002 Center for Applied Mathematics of the Ecole des Mines de Paris and Esterel Technologies Inc.**
Development, during the preparation of a PhD in Computer Science, of several parts of the Esterel compiler and associated tools, integrated in the Esterel Studio development environment marketed by Esterel Technologies Inc. (> 50 000 lines of C++).
- 1999 – 2002 Nice Sophia Antipolis University**
Teaching Assistant: lectures and tutorials.
Degree (*DEUG*) in CS and Math: Programming, Algorithms and Data Structures, Functional Programming.
Bachelor's Degree (*Licence*) in CS: Advanced Functional Programming.
Master's Degree (*Maîtrise*) in CS: Advanced C++.
- 1999 – 2003 Institut Supérieur d'Informatique et d'Automatique (ISIA)**
Lectures and tutorials about graphical interfaces in AWT/Swing, JDK tools, JavaBeans, Design Patterns.
- 2000 Cadence Design Systems Berkeley Laboratories, California**
3 month research internship.
- 1998 3 orthodontist offices**
Development under MS Access of a complete management system for orthodontist offices: patients, estimates, invoices, etc.; 3D geometrical computation module on radiographies.
- 1994 - 1998 Amitel Holding (Blindex, Fil de Vie, SVI and VolFeu Alarm companies)**
Development under MS Access and in C++ of a complete management and decision support system (management of customers, estimates, invoices, supplies, accounting, etc.).
De facto IT manager (reporting directly to the CEO, development manager, maintenance of workstations and servers under Windows 95/NT, etc.).
- August 1994 CONTRASTE Association (ANSTJ)**
CS advisor in a summer camp for sciences.
- 1993 Fil de Vie Company (electronic surveillance of people and estates)**
Development under MS Access of a complete management system (customers, accounting, received messages, etc.) and a software written in Pascal and 80x86 Assembler that processed electronic surveillance messages (received on serial ports).
- 1993 Perrino Company (chemist's inventories)**
Development under MS Access of a complete management system (customers, accounting, inventories, etc.).

SKILLS

CS Languages: **C, C++, Java, C#, Visual BASIC**, Eiffel, Lisp, **Scheme**, Caml-Light, PHP, **Asm 80x86, .Net CIL, SQL**
OSes: **Windows XP/2000/NT**, UNIX (Linux/Solaris)
DBMS: **MS Access, SQL**, MS SQL Server
Web: **[X]HTML, CSS, PHP, Apache**
Softwares: **Visual Studio, JBuilder, Rose, Word, Excel, PowerPoint, Visio, LaTeX**
Languages: French (mother tongue), English (fluent; TOEIC 2002: 960/990)

EDUCATIONAL BACKGROUND

2002 PhD in Computer Science of the Nice Sophia Antipolis University, prepared at the Center for Applied Mathematics of the Ecole des Mines de Paris and at Esterel Technologies Inc.; advisor: Gérard Berry

"Implicit and explicit exploration of the reachable state space of Esterel logical circuits"

Esterel is a language aimed at modeling concurrent, reactive and synchronous systems that communicates through instantaneous broadcasting of signals. Besides usual language constructs, Esterel offers constructs for parallelization, sequencing, preemption, suspension, escaping, instantaneous broadcast of signals, signal waiting, etc. At the heart of the compiler, programs are represented by logical circuits. From there, Esterel programs can be executed by regular processors through the C back-end or they can be converted into integrated circuits, through the VHDL back-end.

The Esterel language is based upon the Finite State Machine (FSM) semantic model. Therefore, the reachable state space of programs can be explored. These reachable state spaces can be explored in a symbolic way, for instance by using Binary Decision Diagrams (BDDs), or explicitly enumerated. However, RSS computations have an exponential complexity in the worst case. I have developed several techniques aiming at reducing the costs of these RSS computations and avoiding as much as possible explosions in time and/or space.

In the framework of implicit techniques (based upon BDDs), I have developed a method that allows to abstract some of the variables involved in computations using a tri-valued logic. This technique, when properly used, allows to drastically reduce the cost of reachable state space computations, both in time and space, at the price of an over-approximation of the result. This technique has been applied in a formal verifier of safety properties.

In the framework of explicit techniques (based upon enumerations), I have developed a new reachable state space exploration engine. This new engine is more efficient than the older one by several orders of magnitude. This engine has led to a new automaton generation tool which has been included in the Esterel compiler, integrated within the Esterel Studio integrated development environment, marketed by Esterel Technologies Inc.. This new engine has also been applied to exhaustive test sequence generation and appeared to be much more efficient than a similar tool based upon BDDs. Eventually, this engine has also led to a formal verifier of safety properties and appeared to be very efficient on models with a strongly linear behavior, on which BDD-based or SAT-based verifiers failed.

1999 Postgraduate Degree (DEA) in Computer Science, Nice Sophia Antipolis University (2nd)

1998 Master's Degree (Maîtrise) in Computer Science, Nice Sophia Antipolis University (3rd)

End of year project: a development environment for DSPs that checks bus access conflicts

1997 Bachelor's Degree (Licence) in Computer Science, Nice Sophia Antipolis University (3rd)

1996 Degree (DEUG) in Math and Computer Science, Nice Sophia Antipolis University

1993 A Level (Baccalauréat) in Math and Physics

HOBBIES AND LEISURES

"Intellectual" movies, scuba diving and underwater biology, reading, swimming, music, travels, photography, skiing

REFERENCES

Gérard Berry, Chief Scientist of Esterel Technologies Inc., member of the French Science Academy

Manuel Serrano, Researcher at the National Research Institute in Computer Science and Automation (INRIA)