Dimitrios I. Diochnos

Computer Scientist

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Personal Information

Father's Name	Ioannis
Date of Birth	April 13, 1980
Place of Birth	Cholargos, Attika, Hellas
Nationality	Hellenic
Marital Status	Single

Education

2007 – now   **Working for my Ph.D. in Mathematical Computer Science.**, *Department of Mathematics, Statistics, and Computer Science*, University of Illinois at Chicago, USA.
Home: http://www.math.uic.edu.

2007   **M.Sc. in Logic, Theory of Algorithms and Computation**, *Department of Mathematics*, National and Kapodistrian University of Athens, Hellas.
Home: http://mpla.math.uoa.gr.
GPA: 8.4 out of 10.0

MASTER THESIS

title	*Real Solving on Algebraic Systems of Small Dimension*
supervisors	Professors Ioannis Z. Emiris, Elias Koutsoupias and Evagelos Raptis
description	Algorithms for real solving of polynomial systems of small dimension via Sturm sequences. An algebraic library in Maple has been created as part of the implementation.

2004   **Ptychion (4-year Bachelor) in Computer Science**, *Department of Informatics and Telecommunications*, National and Kapodistrian University of Athens, Hellas.
Home: http://www.di.uoa.gr.
GPA: 7.4 out of 10.0

UNDERGRADUATE THESIS

title	*Application of Reinforcement Learning and Combinatorial Search to One-Player Games*
supervisors	Professor Panagiotis Stamatopoulos
description	Augmenting learning process of classical *reinforcement-learning* agents through combinatorial search techniques and an application in game *Solo*.

Scholarships

Undergraduate	I fulfilled my undergraduate studies under scholarship by "Zossima Brothers" foundation.

Languages

Greek	Fluent (mother tongue)
English	Cambridge First Certificate in English, Dec 1994
German	Goethe-Institut Zertifikat Deutsch als Fremdsprache, May 1995.

Standardized Tests

iBT TOEFL Scores

Test Date	Nov 17, 2006
Reading	26/30
Listening	27/30
Speaking	23/30
Writing	30/30
Total	106/120
Equivalent Scores	CBT: 263/300, PBT: 623/677

CBT GRE General Scores

Test Date	Dec 14, 2006	
Quantitative	800/800	Percentile Rank: 94%
Verbal	360/800	Percentile Rank: 20%
Analytical Writing	4.5/6.0	Percentile Rank: 52%

Scientific Activities

2006 – 2007 Jan Jul	Member of the *Lab of Geometric and Algebraic Algorithms* at the Dept. of Informatics and Telecommunications, University of Athens. Homepage: http://www.di.uoa.gr/~erga
Sep 2004	Member of the International Scientific Committee (ISC) at the International Olympiad in Informatics (IOI-2004) that was held in Athens. Homepage: http://www.ioi2004.org

Scientific Interests

- Cryptography - Information Security
- Computer Algebra
- Algorithmic Number Theory
- Computational Geometry
- Randomized Algorithms
- Numerical Analysis
- Reinforcement Learning

Employment History

Aug 2007 – now	I wok as a Teaching Assistant at University of Illinois at Chicago. My discussion sessions for this semester are related to Math 118: Mathematical Reasoning.
Jan – Jun 2002	I worked as a teacher in lectures given to high-school teachers under the program *Lifelong Learning: Familiarization with new technologies* which was supported by the Hellenic Ministry of Education due to the general development project "Information Society".
Jan – Jul 2000	I worked at *Othisi* as a Computer Science teacher for the course *Developing Applications under a Programming Environment*.
1998 – 1999 Oct Jul	Head of the Mathematics department at the *Students' Learning Support Center* at *Othisi*.
Othisi	*Othisi* is a preparatory institute which prepares high-school students for entering Higher-Level Education {Universities, Technological Institutions}. Contact Information: Mitropoleos & Chaimanta 7, 151-25 Marousi, Attika, Hellas Phone: +30-210-61.28.814, +30-210-61.43.812 Fax: +30-210-80.61.353 Webpage: http://www.othisi.gr

Working Experience

Operating Systems

All Microsoft™ operating systems, Solaris™ Unix, MacOS™, Linux

Programming Languages

Procedural	C, Perl, Pascal, QBasic, Fortran
Object-Oriented	C++, Java, Object Pascal
Visual	Visual C++, Visual Basic
Interpreted	GW-Basic, Logo
Logic	LPA-Prolog
Functional	Haskell
Shells-Scripts	C, Bourne, Korn, bash, z, pk, MS-DOS, VBScript, JavaScript
Web	HTML

Tools

Administration	Apache
Data-Base	Oracle SQLPlus™, Microsoft SQLServer™
Scientific	Maple™, MatLab™, GNUPlot, Graphmat

Office Automation

TEX, LATEX, Microsoft Office™

Software

The following applications are freely available through my homepage:

Academic — **Database for Undergraduate Lessons**
This is a program that can be used as a database for undergraduate lessons passed at the Dept. of Informatics and Telecommunications as well as a tool for statistical analysis of the GPA and other departmental parameters which are crucial for graduate applications.

Computational Biology — **Inversion Distance and Sorting by Reversals**
Tools that compute the inversion distance of two genomes as well as perform sorting by reversals between two genomes. Part of the source code was used as testbed in IOI-2004.

Computational Alg. Geometry — **Gröbner Bases Computation**
Symbolic Algebra is an application in C++ that computes a Gröbner base of a system of polynomials with integer coefficients. Source code requires MS Visual Studio 6.0 and is currently running only under Windows OS. The homepage of this application is in greek and can be found here: http://www.di.uoa.gr/~stud1098/Symbolic_Algebra
Current version is 0.9.

Computational Geometry — **Voronoi Diagrams and Delaunay Triangulations**
A program (in Visual Basic) that computes the Voronoi Diagram and the Delaunay Triangulation of points in the euclidean plane.

Computer Algebra — **SLV Maple Library**
SLV is a library used in Maple™. The acronym comes from Sturm soLVer. It was developed as part of my master's thesis and solves univariate polynomials or bivariate polynomial systems using Sturm sequences. The solutions are (pairs of) Real Algebraic Numbers in Isolating Interval Representation. The homepage of the library is accessible at: http://www.di.uoa.gr/~erga/soft/SLV_index.html

Cryptography — **Discrete Logarithm**
Some tools (source code and win32 executables) that attack the discrete logarithm problem when machine precision suffices. The webpage hosting these tools is available only in greek at http://www.di.uoa.gr/~stud1098/cryptography/discrete_log.html
Source code is easily extensible in the generic case with the use of GNU Multiprecision Arithmetic Library (GMP).

	Elliptic Curves
	Tools for operations on elliptic curves. Online is available integer factorization with the use of elliptic curves.
Optimization	**The Ellipsoid Method**
	The popular Ellipsoid Method used in Linear Programming, implemented in C.
Reinforcement Learning	**Optimal Policy in game Solo**
	An RL-agent that finds optimal policy in game Solo. The learining process is augmented through combinatorial search techniques. [Undergraduate Thesis]
Strategy Games	**Heroes of Might and Magic III**
	The official homepage for the generic problem of Skill Advancing, which also hosts solvers for the problems presented below, can be found here: http://heroescommunity.com/viewthread.php3?TID=17812&pagenumber=1
	`internals_mc`: *Evaluating Policies with Monte Carlo methods in Skill-Selection problem*, dimis, July 2007. Current version is 1.1 and supports five popular deterministic policies. Soon more will be available.
	`ansa, ansa_dnf`: *Solver for ANSA problem*, dimis, April 2006. Source code for `ansa` is also available in GNU Multiprecision Arithmetic Library (GMP), although it is not necessary for practical applications. `ansa_dnf` was developed in July 2006 in order to reply to more interesting questions posed in DNF form.

PUBLICATIONS

2007

Computer Algebra	*On the complexity of real solving bivariate systems*, Dimitrios I. Diochnos, Ioannis Z. Emiris, and Elias P. Tsigaridas, Proc. Annual ACM International Symposium on Symbolic and Algebraic Computation (ISSAC), Waterloo, Canada, 2007. A copy is accessible at http://www.di.uoa.gr/~stud1098/Computer_Algebra/det-issac-07.pdf

THESES, TECHNICAL REPORTS AND OTHER ARTICLES

MASTER THESIS

Computer Algebra	*Real Solving on Algebraic Systems of Small Dimension*, Dimitrios I. Diochnos, Master Thesis, June 2007. Copy available at http://www.di.uoa.gr/~stud1098/diploma/diochnos_diploma.pdf

UNDERGRADUATE THESIS

Reinforcement Learning	*Application of Reinforcement Learning and Combinatorial Search to One-Player Games*, Dimitrios I. Diochnos, Undergraduate Thesis, Feb 2004. Copy available in greek at http://www.di.uoa.gr/~stud1098/SOLO/diochnos_undergrad.pdf

TECHNICAL REPORTS

Computer Algebra	*On the complexity of real solving bivariate systems*, D. I. Diochnos, I. Z. Emiris, and E. P. Tsigaridas. INRIA RR 6116. Available at https://hal.inria.fr/inria-00129309

SURVEYS AND OTHER ARTICLES

IOI-2004	*Enumerating Hurdles*, Dimitrios I. Diochnos and Ioannis Z. Emiris, problem in `IOI-2004`, Sep 2004. An electronic copy of the proposition is available at http://www.di.uoa.gr/~stud1098/ioi2004/hurdles.pdf.
Cryptography	*Ways to Attack Popular Cryptosystems*, Dimitrios I. Diochnos, July 2005. Copy available in greek at http://www.di.uoa.gr/~stud1098/cryptography/Attacks/attacks.pdf
Computational Alg. Geometry	*An Upper Bound on the Complexity of the Buchberger Algorithm*, Dimitrios I. Diochnos and George Piliouras, $\mu \prod \lambda \forall$, Feb 2005. Copy available in greek at http://www.di.uoa.gr/~stud1098/Symbolic_Algebra/buch_complexity.zip

Programming | *Introduction to Programming (with C)*, is a thread which aims to cover basic algorithmic techniques with a presentation of the C programming language. The nature of the thread is much more interactive than other tutorials online, since it can be found on a public forum. The homepage is: http://heroescommunity.com/viewthread.php3?TID=20082

Strategy Games | The following articles were published in HeroesCommunity, hence the tone is more informal compared to a technical report. Nevertheless, they have influenced contemporary practice:

Crag-Hack on ANSA, dimis, July 2006.
http://www.di.uoa.gr/~stud1098/HeroesIII/internals/crag-hack/crag-ansa.pdf

Imp Caches, Statistical Analysis, dimis, June 2005. Electronic copy:
http://www.di.uoa.gr/~stud1098/HeroesIII/Caches/Experiment/caches_statistics.pdf

OTHER ACTIVITIES

Feb 2005–Today | Member of HeroesCommunity. My nickname is `dimis` and my profile can be found here:
http://heroescommunity.com/member.php3?action=viewprofile&UserName=dimis

Jun 1999–Today | Member of SETI@HOME. Homepage: http://setiathome.berkeley.edu My profile can be found here: http://setiathome.berkeley.edu/view_profile.php?userid=2001284

OTHER INTERESTS

Education | I am interested in making science and technology available to the public, especially to people with disabilities.

Strategy Games | I like all sort of turn-based strategy games. More particularly Heroes of Might and Magic III, Sid Meier's Civilization II and ofcourse chess.

Hill Climbing | I always find intriguing to climb up a mountain.

REFERENCES

These persons are familiar with my professional qualifications and my character:

Professor Ioannis Z. Emiris
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University of Athens   Fax: +30-210-727.5114
Panepistimiopolis, 15784 Athens, Hellas   Email: elias [AT] di.uoa.gr

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Professor Panagiotis Stamatopoulos
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