

Dimitrios I. Diochnos

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SCIENTIFIC INTERESTS

• Machine Learning • Artificial Intelligence • Data Science • Theoretical Computer Science

ACADEMIC APPOINTMENTS

2019 –	Assistant Professor in Computer Science, University of Oklahoma (OU) , USA.
2015 – 2019	Hobby postdoctoral research associate, University of Virginia (UVA) , USA.
2013 – 2015	Postdoctoral research associate, University of Edinburgh , UK.

EDUCATION

2013	PhD, Department of Mathematics, Statistics, and Computer Science, University of Illinois at Chicago (UIC) , USA
2007	MSc, Interdisciplinary Graduate Program in Logic, Algorithms and Computation, Department of Mathematics, National and Kapodistrian University of Athens , Hellas
2004	Ptychion, Department of Informatics and Telecommunications, National and Kapodistrian University of Athens , Hellas

FELLOWSHIPS & AWARDS

Reviewing Award	NeurIPS 2019 Top Reviewers (Reserved Registration Spot) IJCAI-16 Quality Reviewing (1 Blue Ribbon)
Teaching Award	MCS 260 - Introduction to Computer Science, Fall 2009.
Graduate	UIC Chancellor's Graduate Research Fellowship, Spring - Summer 2010; \$2,500. – Renewed for Second and Final Year (Maximum), Spring - Summer 2011; \$2,500.
Undergraduate	I fulfilled my studies with fellowship by “Zossima Brothers” foundation; \$3,000.

SCIENTIFIC ACTIVITIES & SERVICE

December 2020	Program Committee Member, <i>34th Conference on Neural Information Processing Systems</i> , NeurIPS 2020, Vancouver, Canada. Homepage: https://neurips.cc/Conferences/2020 .
July 2020	Program Committee Member, <i>Thirty-Seventh International Conference on Machine Learning</i> , ICML 2020, Vienna, Austria. Homepage: https://icml.cc/Conferences/2020 .
January 2020	Publicity Chair and Program Committee Member, <i>Sixteenth International Symposium on Artificial Intelligence and Mathematics</i> , ISAIM 2020, Fort Lauderdale, FL, USA. Homepage: http://isaim2020.cs.ou.edu .
December 2019	Program Committee Member, <i>33rd Conference on Neural Information Processing Systems</i> , NeurIPS 2019, Vancouver, Canada. Homepage: https://neurips.cc/Conferences/2019 .
September 2019	Organizing Committee Member, <i>2nd Symposium on Artificial Intelligence and Machine Learning at the University of Oklahoma</i> , Norman, Oklahoma, USA. Homepage: http://www.ou.edu/coe/ai-ml/past_meetings/ai-ml .
August 2019	Program Committee Member, <i>28th International Joint Conference on Artificial Intelligence</i> , IJCAI-19, Macao, China. Homepage: https://www.ijcai19.org/program-committee.html .
February 2018	Program Committee Member, <i>Thirty-Second AAAI Conference on Artificial Intelligence</i> , AAAI 2018, New Orleans, Louisiana, USA. Homepage: https://aaai.org/Conferences/AAAI/aaai18.php .

January 2018	Publicity Chair and Program Committee Member, <i>Fifteenth International Symposium on Artificial Intelligence and Mathematics</i> , ISAIM 2018, Fort Lauderdale, FL, USA. Homepage: https://isaim2018.cs.virginia.edu .
August 2017	Program Committee Member, <i>26th International Joint Conference on Artificial Intelligence</i> , IJCAI-17, Melbourne, Australia. Homepage: https://ijcai-17.org/program-committee.html .
July 2016	Program Committee Member, <i>25th International Joint Conference on Artificial Intelligence</i> , IJCAI-16, New York City, NY, USA. Homepage: https://ijcai-16.org/index.php/welcome/view/program_committee .
January 2016	Publicity Chair and Program Committee Member, <i>Fourteenth International Symposium on Artificial Intelligence and Mathematics</i> , ISAIM 2016, Fort Lauderdale, FL, USA. Homepage: https://isaim2016.cs.virginia.edu .
2013 – 2015	Core member and seminar organizer of the Agents Group, Centre for Intelligent Systems and their Applications, School of Informatics, The University of Edinburgh. Homepage: https://groups.inf.ed.ac.uk/agents .
January 2014	Publicity Chair, <i>Thirteenth International Symposium on Artificial Intelligence and Mathematics</i> , ISAIM 2014, Fort Lauderdale, FL, USA. Homepage: https://www.cs.uic.edu/Isaim2014 .
January 2012	Publicity Chair, <i>Twelfth International Symposium on Artificial Intelligence and Mathematics</i> , ISAIM 2012, Fort Lauderdale, FL, USA. Homepage: https://www.cs.uic.edu/Isaim2012 .
February 2010	Webmaster, <i>Workshop in Graph Theory and Combinatorics in Memory of Uri Peled</i> , University of Illinois at Chicago, Chicago, IL, USA. Homepage: https://www.math.uic.edu/PeledWorkshop .
September 2004	Member of the International Scientific Committee (ISC) at the <i>International Olympiad in Informatics</i> , IOI-2004, Athens, Attiki, Hellas. Homepage: https://www.epy.gr/ioi2004 .
Editor	Special issue of <i>Annals of Mathematics and Artificial Intelligence (AMAI)</i> devoted to selected papers from the <i>Fifteenth International Symposium on Artificial Intelligence and Mathematics</i> , ISAIM 2018.
Reviewer	SODA, AAI, ICALP, IJCAI, ISAIM, AAMAS, ALENEX, CASC.

PUBLICATIONS

A copy of my papers is available at <https://www.cs.ou.edu/~diochnos/research/publications>.

17. Vanda Balogh, Gábor Berend, Dimitrios I. Diochnos, György Turán. Understanding the Semantic Content of Sparse Word Embeddings Using a Commonsense Knowledge Base, *Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI)*, New York, NY, USA, 2020. Also a poster presentation in *NeurIPS 2019 Workshop on Knowledge Representation & Reasoning Meets Machine Learning (KR2ML)*, Vancouver, Canada, 2019.
16. Saeed Mahloujifar, Dimitrios I. Diochnos, Mohammad Mahmoody. Learning under p-tampering poisoning attacks, *Annals of Mathematics and Artificial Intelligence*, 2019.
15. Saeed Mahloujifar, Dimitrios I. Diochnos, Mohammad Mahmoody. Curse of Concentration in Robust Learning: Evasion and Poisoning Attacks from Concentration of Measure. *Thirty-Third AAAI Conference on Artificial Intelligence (AAAI)*, Honolulu, Hawaii, USA, 2019. Also had a poster presentation in *NeurIPS 2018 Workshop on Security in Machine Learning*, Montréal, Canada, 2018.
14. Dimitrios I. Diochnos, Saeed Mahloujifar, Mohammad Mahmoody. Adversarial Risk and Robustness: General Definitions and Implications for the Uniform Distribution, *Thirty-Second Conference on Neural Information Processing Systems (NeurIPS)*, Montréal, Canada, 2018.
13. Saeed Mahloujifar, Dimitrios I. Diochnos, Mohammad Mahmoody. Learning under p-Tampering Attacks, *Twenty-Ninth International Conference on Algorithmic Learning Theory (ALT)*, Lanzarote, Spain, 2018. A

preliminary version was also presented in the *Fifteenth International Symposium on Artificial Intelligence and Mathematics (ISAIM)*, Fort Lauderdale, Florida, USA, 2018.

12. Michael Rovatsos, Dimitrios I. Diochnos, Zhenyu Wen, Sofia Ceppi, Pavlos Andreadis. SmartOrch: An Adaptive Orchestration System for Human-Machine Collectives, *Thirty-Second ACM Symposium on Applied Computing (SAC 2017)*, Marrakesh, Morocco, 2017.
11. Dimitrios I. Diochnos. On the Evolution of Monotone Conjunctions: Drilling for Best Approximations, *Twenty-Seventh International Conference on Algorithmic Learning Theory (ALT 2016)*, Bari, Italy, ALT 2016: 98–112, 2016.
10. Ognjen Šćekić, Tommaso Schiavinotto, Dimitrios I. Diochnos, Michael Rovatsos, Hong-Linh Truong, Iacopo Carreras, Schahram Dustdar. Programming Model Elements for Hybrid Collaborative Adaptive Systems, *First IEEE International Conference on Collaboration and Internet Computing (CIC 2015)*, Hangzhou, China, CIC 2015: 278–287, 2015.
9. Ognjen Šćekić, Daniele Miorandi, Tommaso Schiavinotto, Dimitrios I. Diochnos, Alethia Hume, Hong-Linh Truong, Michael Rovatsos, Schahram Dustdar, Fausto Giunchiglia. SmartSociety – A Platform for Collaborative People-Machine Computation, *Eighth IEEE International Conference on Service Oriented Computing & Applications (SOCA 2015)*, Rome, Italy, SOCA 2015: 147–154, 2015.
8. Michael Rovatsos, Dimitrios I. Diochnos, Matei Craciun. Agent Protocols for Social Computation, *Second International Workshop on Multiagent Foundations of Social Computing (MFSC)*, co-located with AAMAS 2015, Istanbul, Turkey, CARE/MFSC@AAMAS 2015: 94–111, 2015.
7. Tanya Berger-Wolf, Dimitrios I. Diochnos, András London, András Pluhár, Robert H. Sloan, György Turán. Commonsense knowledge bases and network analysis, *11th International Symposium on Logical Formalizations of Commonsense Reasoning*, Ayia Napa, Cyprus, 2013.
6. Dimitrios I. Diochnos, Robert H. Sloan, György Turán. On multiple-instance learning of halfspaces, *Information Processing Letters*, 112(23): 933–936, 2012.
5. Dimitrios I. Diochnos. Leveling-Up in Heroes of Might and Magic III, *Fifth International Conference on Fun with Algorithms (FUN 2010)*, Ischia Island, Italy, FUN 2010: 145–155, 2010.
4. Dimitrios I. Diochnos and György Turán. On Evolvability: The Swapping Algorithm, Product Distributions, and Covariance, *Fifth Symposium on Stochastic Algorithms, Foundations and Applications (SAGA 2009)*, Sapporo, Japan, SAGA 2009: 74–88, 2009.
3. Dimitrios I. Diochnos, Ioannis Z. Emiris, Elias P. Tsigaridas. On the asymptotic and practical complexity of solving bivariate systems over the reals, *Journal of Symbolic Computation*, 44(7): 818–835, 2009. Also available at <https://arxiv.org/abs/1203.1017>.
2. Δημήτρης Διώχνος. Επίλυση Αλγεβρικών Συστημάτων Μικρής Διάστασης στους Πραγματικούς, *Ετήσιο Βιβλίο με Επιλεγμένες Πτυχιακές και Διπλωματικές Εργασίες*, Τμήμα Πληροφορικής και Τηλεπικοινωνιών, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Ελλάδα, 5: 23–32, 2008.
Dimitris Diochnos. Solving Algebraic Systems of Small Dimension over the Reals, *Annual Book of Selected Undergraduate and Graduate Theses*, Department of Informatics and Telecommunications, National and Kapodistrian University of Athens, Hellas, 5: 23–32, 2008.
1. Dimitrios I. Diochnos, Ioannis Z. Emiris, Elias P. Tsigaridas. On the Complexity of Real Solving Bivariate Systems, *Proceedings Annual ACM International Symposium on Symbolic and Algebraic Computation (ISSAC)*, Waterloo, Canada, ISSAC 2007: 127–134, 2007.

THESES

A copy of my theses is available at <https://www.cs.ou.edu/~diochnos/research/theses>.

PhD Thesis. Analysis of Algorithms in Learning Theory and Network Analysis of Knowledge Bases. University of Illinois at Chicago, Chicago, IL, USA, July, 2013. Advisor: György Turán.

Master's Thesis. Real Solving on Algebraic Systems of Small Dimension. National and Kapodistrian University of Athens, Athens, Hellas, June, 2007. Advisor: Ioannis Z. Emiris.

Undergraduate Thesis. Application of Reinforcement Learning and Combinatorial Search to One-Player Games. National and Kapodistrian University of Athens, Athens, Hellas, February, 2004. Advisor: Panagiotis Stamatopoulos.

TECHNICAL REPORTS

A copy of the following is available at https://www.cs.ou.edu/~diochnos/research/tech_reports.

1. Dimitrios I. Diochnos. Commonsense Reasoning and Large Network Analysis: A Computational Study of ConceptNet 4, *arXiv:1304.5863 [cs.AI]*.

SURVEYS, TUTORIALS & OTHER ARTICLES

Online pointers are under my homepage <https://www.cs.ou.edu/~diochnos>.

4. Dimitrios I. Diochnos. Essentials on the Analysis of Randomized Algorithms, February 2009.
Online: </research/other/randomized/essentials.pdf>.
3. Dimitrios I. Diochnos. A Brief Introduction to Search Problems, March 2008.
Online: /research/other/ai/intro_search.pdf.
2. Dimitrios I. Diochnos. An Introduction to the Terminal, January, 2008. A tutorial for the UNIX terminal; referenced each semester by the course *MCS 260 - Introduction to Computer Science* taught at the Mathematics department of UIC. Online: </tips/terminal>.
1. Dimitrios I. Diochnos and Ioannis Z. Emiris. Enumerating Hurdles, problem in *IOI-2004*, September 2004.
Online: </research/other/ioi2004/hurdles.pdf>.

TALKS, TUTORIALS, POSTER SESSIONS & OTHER PRESENTATIONS

- Lower Bounds for Adversarially Robust PAC Learning. *Sixteenth International Symposium on Artificial Intelligence and Mathematics (ISAIM 2020)*, Fort Lauderdale, FL, USA, January 6-8, 2010.
- Lower Bounds for Adversarially Robust PAC Learning. *NeurIPS 2019 Workshop on Safety and Robustness in Decision Making*, Vancouver, Canada, December 13, 2019.
- Understanding the Semantic Content of Sparse Word Embeddings Using a Commonsense Knowledge Base. *NeurIPS 2019 Workshop on Knowledge Representation & Reasoning Meets Machine Learning (KR2ML)*, Vancouver, Canada, December 13, 2019.
- Aspects of Robustness in Machine Learning and Data Mining – Brainstorming Panel. *Symposium on Artificial Intelligence and Machine Learning at the University of Oklahoma*, Norman, OK, September 27, 2019.
- On Adversarial Examples and Misclassification. *Symposium on Artificial Intelligence and Machine Learning at the University of Oklahoma*, Norman, OK, September 27, 2019.
- Adversarial Risk and Robustness: General Definitions and Implications for the Uniform Distribution. *Thirty-Second Conference on Neural Information Processing Systems (NeurIPS)*, Montréal, Canada, December 5, 2018.
- On the evolution of monotone conjunctions: drilling for best approximations. *Theoretical Computer Science Seminar*, University of Illinois at Chicago, Chicago, IL, USA, March 7, 2017.
- On the Evolution of Monotone Conjunctions: Drilling for Best Approximations. *Twenty-Seventh International Conference in Algorithmic Learning Theory (ALT 2016)*, Bari, Italy, October 19, 2016.
- Drilling for Best Approximations in Evolution. *Postdoctoral Research Symposium*, Charlottesville, VA, USA, September 20, 2016.

- SmartSociety. *SICSA DEMOFest 14*, Edinburgh, UK, October 30, 2014.
- SmartSociety. *SICSA DEMOFest 13*, Glasgow, UK, November 5, 2013.
- Commonsense Knowledge Bases and Network Analysis. *Commonsense*, Ayia Napa, Cyprus, May 27, 2013.
- On Multiple-Instance Learning of Halfspaces. *X-Theory Day*, National and Kapodistrian University of Athens, Athens, Hellas, December 19, 2011.
- Evolvability in Learning Theory. Eötvös Loránd University, Budapest, Hungary, November 23, 2011.
- Evolvability in Learning Theory. University of Szeged, Szeged, Hungary, November 16, 2011.
- On Evolvability: The Swapping Algorithm, Product Distributions, and Covariance. *Algorithms Seminar*, National and Kapodistrian University of Athens, Athens, Hellas, December 23, 2010.
- Leveling-Up in Heroes of Might and Magic III. *Fifth International Conference on Fun with Algorithms (FUN 2010)*, Ischia Island, Italy, June 3, 2010.
- On Evolvability: The Swapping Algorithm, Product Distributions, and Covariance. *Eleventh International Symposium on Artificial Intelligence and Mathematics (ISAIM 2010)*, Fort Lauderdale, FL, USA, January 7, 2010.
- On Evolvability: The Swapping Algorithm, Product Distributions, and Covariance. *Midwest Theory Day, Fall 2009*, DePaul University, Chicago, IL, USA, December 5, 2009.
- On Evolvability: The Swapping Algorithm, Product Distributions, and Covariance. *Fifth Symposium on Stochastic Algorithms, Foundations and Applications (SAGA 2009)*, Hokkaido University, Sapporo, Japan, October 27, 2009.
- Implementation and Experiments on Real Solving of Bivariate Systems. *ACS Workshop*, Freie Universität, Berlin, Germany, May 9, 2007.

ADVISING

Advised. I have advised the following undergraduate students.

- Nicholas Georgiou, Undergraduate Capstone Project, University of Virginia, 2017-2018.
- Alyson Irizarry, Undergraduate Capstone Project, University of Virginia, 2017-2018.
- Andrew Lee, Undergraduate Capstone Project, University of Virginia, 2017-2018.
- Ceyer Wakilpoor, Undergraduate Capstone Project, University of Virginia, 2017-2018.

Co-Advised. I have co-advised the following students.

- Ignas Kaziukenas, M.Sc., University of Edinburgh, UK, 2013-2014.
- Rahul Kushwaha, M.Sc., University of Illinois at Chicago, USA, 2013-2014.
- Sid Shen, M.Sc., University of Edinburgh, UK, 2013-2014.

TEACHING

Assistant Professor, OU. Courses taught:

- *CS3823 - Theory of Computation*, undergraduate course, Fall 2019.

Hobby Postdoctoral Research Associate, UVA. Courses taught:

- *CS3102 - Theory of Computation*, undergraduate course, Fall 2018.
- *CS4710 - Artificial Intelligence*, undergraduate course, Spring 2016, Fall 2016, Fall 2017.
- *CS6501 - Learning Theory*, graduate course, Fall 2015, Spring 2017, Spring 2018, Spring 2019.

Teaching Assistant, UIC. As a TA at UIC (2007-2013) I maintained a webpage for every course that I taught together with separate notes prepared by me for each class. Throughout the years I taught:

- *MCS 260 - Introduction to Computer Science,*
- *MCS 275 - Programming Tools and File Management,*
- *MCS 360 - Introduction to Data Structures,*
- *MCS 401 - Computer Algorithms I,*
- *MATH 118 - Mathematical Reasoning,*
- *MATH 160 - Finite Mathematics for Business,*
- *MATH 210 - Calculus III.*

Reviews by students are available upon request.

Teaching, Othisi. In 2000 I worked at Othisi as a Computer Science teacher for the course *Developing Applications in a Programming Environment*.

SOFTWARE

Apart from Smart Sharing, the following programs are freely available through my website under the Software section or you can find links that will lead you to the source code and the executable.

Smart Sharing (2013-2015). Smart Sharing is a web application allowing registered users to offer or request rides between different locations. Smart Sharing goes beyond current approaches in car-pooling in that users have reputation, it generates matches between users taking their personal preferences into account, allows negotiation between users for booking rides, takes care of the entire synchronisation that is needed on the backend so that necessary signals can be automated and sent to the appropriate users (e.g. a commuter is negotiating with two drivers in parallel, and an agreement is reached with one of them), performs versioning of the critical resources, and allows a full trace of provenance for auditing, accountability, and explanation purposes. Orchestration of the platform as well as of the components is performed in an asynchronous, non-blocking manner aimed to cover applications at scale following the latest web standards and technologies. The code on the backend is written in Javascript on node.js using MongoDB for the database. On the client side we use HTML5, Javascript and jQuery. My work provided the peer manager for the platform where users register, authenticate, and have their profiles (about 10K lines of code), together with the orchestration service (about 30K lines of code) that is responsible for the work and synchronisation that is needed on the backend thus allowing the described functionality above. Homepage of the project: <http://www.smart-society-project.eu>.

SLV Maple Library. SLV is a library used in MapleTM. 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. Homepage: http://erga.di.uoa.gr/soft/SLV/SLV_index.html. (Master's Thesis)

Optimal Policy in Game Solo. An RL-agent that finds optimal policy in game Solo. The learning process is augmented through combinatorial search techniques. (Undergraduate Thesis)

Heroes of Might and Magic III. Solvers for the general problem of Skill Advancing are hosted in the webpage <https://www.cs.ou.edu/~diochnos/software/games/homm3>. These solvers also appear in the relevant thread in *Heroes Community* <http://heroescommunity.com/viewthread.php3?TID=17812>.

skills: Evaluation of user's policy based on skill trees and limited randomness, dimis, September 2009. Current version is 2.0 and supports five popular deterministic policies.

internals_mc: Evaluating Policies with Monte Carlo methods in Skill-Selection problem, dimis, July 2007. Current version is 2.0 and supports five popular deterministic policies with the use of the PTHREADS library.

ansa, *ansaExtended*: Solver for ANSA (AR) problem, dimis, April 2006. Source code for *ansa* is also available in GNU Multiprecision Arithmetic Library (GMP). *ansaExtended* was developed in July 2006 in order to answer more interesting questions posed in Disjunctive Normal Form (DNF).

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 in IOI-2004.

The Ellipsoid Method. The popular Ellipsoid Method used in Linear Programming, implemented in C.

Database for Undergraduate Courses. This is a program that can be used as a database for undergraduate courses passed at the Department 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.

WORKING EXPERIENCE

Operating Systems. Linux, Mac OS X, Solaris Unix, and all Microsoft operating systems.

Programming Languages. All major programming languages including, but not limited to, C, Objective C, C++, Visual Basic, Python, Cython, Pascal, LPA-Prolog, Haskell.

Web Related Technologies. Javascript, node.js, express web application framework for node, jade node template engine, browserify, sockets, RESTful applications, cross-origin resource sharing (CORS), MongoDB¹, MongoDB Management Service (MMS), mongoose, mongoose-version, Apache, HTML 5, jQuery, CSS, PHP.

Miscellaneous. Model-View-Controller (MVC), Core Graphics, MapKit, NSURLConnection, PTHREADS, Message Passing Interface (MPI), GNU Multiple Precision Arithmetic Library (GMP), Scalable Parallel Random Number Generators Library (SPRNG), Subversion, Git, SQLite, Oracle SQL Plus, GNUPlot, Maple, igraph, R, T_EX, L^AT_EX, X_EL_AT_EX, shell scripts in Unix / Linux / MS-DOS.

LANGUAGES

Fluent		Greek (native), English
Elementary		German

RECOMMENDATION LETTERS

Available upon request.

UPDATED

Last update was performed on April 24, 2020 at 01:17.

¹M102: MongoDB for DBAs certificate [available from the MongoDB University](#).