

# Vissarion FISIKOPOULOS

Algorithms Research Group  
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## PERSONAL DATA

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Born: 1983, Greece

Gender: Male

Citizenship: Greek

## RESEARCH INTERESTS

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- High-dimensional Computational Geometry
- Algorithm Engineering
- Randomized Geometric Algorithms
- Computational Algebraic Geometry

## PROFESSIONAL ACTIVITIES

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- 07/2014 - present : | **Postdoc Researcher**, Algorithms Research Group, Université libre de Bruxelles (ULB)  
(mentor: Dr. Stefan Langerman)
- 05/2014 - 07/2014 : | **Postdoc Researcher**, National Institute for Mathematical Sciences, Daejeon, South Korea  
Thematic Program on Applied Algebraic Geometry (mentor: Prof. Bernd Sturmfels)
- 11/2013 - 06/2014 : | **Research Assistant**, University of Athens, Greece (*PhD funding, advisor: Prof. I.Z. Emiris*)  
THALIS - "Advanced Geometric Computing & Critical Applications", Greece & EU
- 7/2012 : | **Visitor PhD student**, Theory of Combinatorial Algorithms Group, ETH Zurich, Switzerland  
(mentor: Prof. Bernd Gärtner)
- 02/2011 - 10/2013 : | **Research Assistant**, University of Athens, Greece (*PhD funding, advisor: Prof. I.Z. Emiris*)  
"Computational Geometric Learning" (CGL), ICT, EU
- 4-12/2010 : | **Research Assistant**, University of Athens, Greece  
"Semantic Sensor Grids" (SemSorGrid4Env), ICT, EU (mentor: Prof. Manolis Koubarakis)
- 7-8/2009: | **Internship**, INRIA, Sophia-Antipolis, France  
"Meshing of periodic minimal surfaces", Geometrica Group (mentor: Dr. Monique Teillaud)
- 2007 - 2008: | **Software developer**, Business Web Solutions, Patras, Greece  
"Development of server-client platform for web applications (PHP/Action-script)"

## EDUCATION

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- 2014 **PhD**, Computer Science, University of Athens, Greece  
"High-dimensional polytopes defined by oracles: algorithms, computations and applications"
- 2009 **MSc**, Logic, Algorithms and Computation, University of Athens, Greece
- 2007 **Diploma** (5-year-degree), Computer Engineering and Informatics, University of Patras, Greece

## PUBLICATIONS

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### Preprints

1. Combinatorics of 4-dimensional resultant polytopes.  
*Joint with A.Dickenstein and I.Z.Emiris. (Journal version in preparation)*
2. Efficient edge skeleton computation for polytopes defined by oracles.  
*Joint with I.Z.Emiris and B.Gaertner. (Submitted to journal)*
3. Faster geometric algorithms via dynamic determinant computation.  
*Joint with L.Peñaranda. (Journal version in preparation)*

### Peer-reviewed Journals

1. An oracle-based, output sensitive algorithm for projections of resultant polytopes.  
*Joint with I.Z.Emiris, C.Konaxis and L.Peñaranda.*  
*In International Journal of Computational Geometry and Applications (IJCGA), vol. 23, pp. 397-423, (Special issue) World Scientific 2013.*

### Peer-reviewed Conferences

1. Efficient random walk methods for approximating polytope volume.  
*Joint with I.Z.Emiris.*  
*In Proc. of 30th ACM Symp. on Comput. Geometry (SoCG '14), Kyoto, Japan. (Also in arXiv:1312.2873)*
2. Combinatorics of 4-dimensional resultant polytopes.  
*Joint with A.Dickenstein and I.Z.Emiris.*  
*In Proc. of the 38th ACM Symp. on Symbolic and Algebraic Computation (ISSAC '13), Boston, MA, USA.*
3. Faster geometric algorithms via dynamic determinant computation.  
*Joint with L.Peñaranda.*  
*In Proc. of European Symposium on Algorithms (ESA '12), Ljubljana, Slovenia.*
4. An output-sensitive algorithm for computing projections of resultant polytopes.  
*Joint with I.Z.Emiris, C.Konaxis and L.Peñaranda.*  
*In Proc. of 28th ACM Symp. on Comput. Geometry (SoCG '12), NC, USA.*

### Other conferences and workshops

1. A software framework for computing Newton polytopes of resultants and (reduced) discriminants. *Joint with I.Z.Emiris and C.Konaxis. 12th International Conference on Effective Methods in Algebraic Geometry (MEGA 2013), Frankfurt, Germany (poster).*
2. Efficient volume and edge-skeleton computation for polytopes given by oracles. *Joint with I.Z.Emiris and B.Gaertner. In Proc. of 29th European Workshop on Computational Geometry (EuroCG13), Braunschweig, Germany, 2013.*
3. Optimizing the computation of sequences of determinantal predicates. *Joint with I.Z.Emiris and L.Peñaranda. In Proc. of 28th European Workshop on Computational Geometry (EuroCG12), Assisi, Perugia, Italy, 2012.*
4. Exact and approximate algorithms for resultant polytopes. *Joint with I.Z.Emiris and C.Konaxis. In Proceedings of 28th European Workshop on Comput. Geometry (EuroCG12), Assisi, Perugia, Italy, 2012.*
5. In silico tomographic image generation using Monte Carlo and computational geometry. *Joint with K.Eftaxias and G.M.Spyrou. 10th IEEE Intern. Conf. Inf. Techn. & Applic. in Biomed. (ITAB) 2010.*
6. Meshing of Triply-Periodic Smooth Surfaces in CGAL. *Joint with M.Caroli and M.Teillaud. Seventh International Conference on Curves and Surfaces, Avignon, France, 2010 (poster).*
7. Regular triangulations and resultant polytopes. *Joint with I.Z.Emiris and C.Konaxis. In Proc. of 26th European Workshop on Comput. Geometry (EuroCG10), Dortmund, Germany, 2010.*

### Technical reports, manuscripts, etc.

1. Algorithms for volume approximation of convex bodies. *Joint with I.Z. Emiris. Technical Report CGL-TR-76, November 2013.*

2. Efficient edge skeleton computation for polytopes defined by oracles. *Joint with I.Z. Emiris, B. Gärtner. Technical Report CGL-TR-75, November 2013.*
3. An oracle-based, output-sensitive algorithm for projections of resultant polytopes. *Joint with I.Z.Emiris, C.Konaxis and L.Peñaranda. Technical Report CGL-TR-28, October 2012.*
4. High-dimensional predicates: Algorithms and software. *Joint with I.Z.Emiris and L.Peñaranda. Technical Report CGL-TR-27, October 2012.*
5. Optimizing the computation of sequences of determinantal predicates. *Joint with I.Z.Emiris and L.Peñaranda. Technical Report CGL-TR-14, October 2011.*
6. An output-sensitive algorithm for computing projections of resultant polytopes. *Joint with I.Z.Emiris and C.Konaxis. Technical Report CGL-TR-08, October 2011.*
7. Theoretical results on query processing for RDF/SPARQL with time and space. *Joint with M.Koubarakis, C.Nikolaou. Technical Report TELEIOS-D2.3, 2011.*
8. Enumerating classes of regular triangulations. *Fall School Shapes, Geometry, and Algebra (SAGA) Kolympari, Greece, 2010 (poster).*
9. An implementation of range trees with fractional cascading in C++. *Univ. of Athens. arXiv:1103.4521, 2009. Computational Geometry course 2008 (advisor: Ioannis Z.Emiris)*
10. Representation of complete and incomplete temporal constraint information in relational database systems. *Univ. of Athens. Theory of Databases course 2008 (advisor: Manolis Koubarakis)*

## Theses

1. High-dimensional polytopes defined by oracles: algorithms, computations and applications. *PhD thesis at University of Athens, 2014. (advisor: Prof. Ioannis Z.Emiris)*
2. Triangulations of point sets, high dimensional polytopes and applications. *Master's thesis at University of Athens, 2010. (advisor: Prof. Ioannis Z.Emiris)*
3. Study of the effect of cost policies in the convergence of selfish strategies in pure Nash equilibria in congestion games. *Diploma thesis at University of Patras, 2007. (advisor: Prof. Paul Spirakis)*

## TEACHING EXPERIENCE

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2009 - 2014: | **Teaching Assistant**, Department of Informatics & Telecom/tions, University of Athens

- Computational Geometry (undergrad/grad course) (5 years: 2010-2014)
- Foundations of Databases (grad course) (2009)

2009 - 2011: | **Teacher** in “Prisma secondary private school”; course: “Algorithms”

## SELECTED TALKS

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(c): conference, (i): invited, (s): seminar, (w): workshop, (p): poster

1. (is) ”Polytopes defined by oracles: algorithms and combinatorics”, KAIST Discrete Math Seminar, Korea, 2014.
2. (c) ”Efficient random walk methods for approximating polytope volume”, SoCG, Kyoto Japan, 2014.
3. (is) ”Polytopes defined by Oracles: Algorithms and Combinatorics”, Dept. of Mathematics, University of Padova, 2014.
4. (p) ”Combinatorics of 4-dimensional resultant polytopes”, 2<sup>nd</sup> ERC ”SDModels” Workshop, Berlin, 2013.
5. (c) ”Combinatorics of 4-dimensional resultant polytopes”, ISSAC, Boston USA, 2013.
6. (is) ”Efficient Edge-Skeleton and Volume Computation for Polytopes Defined by Oracles”, DMO, McGill, 2013.
7. (p) ”A software framework for computing Newton polytopes of resultants and discriminants”, MEGA, Frankfurt, 2013.
8. (w) ”Efficient volume and edge-skeleton computation for polytopes given by oracles“ EuroCG, Braunschweig, 2013.
9. (c) ”Faster Geometric Algorithms via Dynamic Determinant Computation.” ESA, Ljubljana, 2012.
10. (is) ”Constructing Polytopes via a Vertex Oracle.” Mittagsseminar, ETH Zurich, 2012.

11. (c) “An output-sensitive algorithm for computing projections of resultant polytopes.” SoCG, NC USA, 2012.
12. (w) “Regular triangulations & resultant polytopes.” EuroCG, Dortmund, 2010.

## SERVICE

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### Reviewer

- Symposium on Experimental Algorithms (SEA), ACM Symp. on Comput. Geometry (SoCG), SIAM Algorithm Engineering and Experiments (ALENEX), European Symposium on Algorithms (ESA), Effective Methods in Algebraic Geometry (MEGA), Algorithmica Journal.

## TECHNICAL SKILLS

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PROGRAMMING: C, C++, Java, Python, Lisp, Unix shell scripting, Matlab, Maple, WWW/Databases (PHP, SQL, Javascript, HTML, CSS, XML/XSL), Flex/Bison, Assembly

## LANGUAGE SKILLS

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GREEK: native: (mother tongue)  
ENGLISH: fluent: (First Certificate in English (FCE), University of Cambridge)  
GERMAN: basic: (Zertifikat Deutsch als Fremdsprache (ZDaF), Goethe Institut)

## REFERENCES

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- Prof. Dr. Alicia Dickenstein  
Department of Mathematics  
University of Buenos Aires  
<http://mate.dm.uba.ar/~alidick>
- Prof. Dr. Bernd Gärtner  
Institute of Theoretical Computer Science  
ETH Zurich  
<http://www.inf.ethz.ch/personal/gaertner>
- Prof. Dr. Ioannis Z. Emiris  
Dept. of Informatics and Telecommunications  
University of Athens  
<http://www.di.uoa.gr/~emiris>
- Senior Researcher Dr. Monique Teillaud  
Geometrica Team  
INRIA Sophia Antipolis - Méditerranée  
<http://www-sop.inria.fr/members/Monique.Teillaud/>
- Prof. Dr. Michael Joswig  
Department of Mathematics  
Technical University Berlin  
<http://page.math.tu-berlin.de/~joswig/>

## MISCELLANEOUS

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### Event Organization

- Final Research Workshop of EU project “Computational Geometry Learning”, Vravrona, Greece, 2013
- 7th Athens Colloquium on Algorithms and Complexity University of Athens, Athens, Greece, 2012
- Fall School “ShApes, Geometry and Algebra (SAGA)”, Kolympari, Greece, October 4-8 2010

### Professional Membership

- Technical Chamber of Greece (TEE-TCG), ACM Symbolic and Algebraic Manipulation