Konstantinos GAVRIIL

Contact

website: konstantg.me
e-mail: konstantinosgavr@gmail.com
mobile: +43 677 620 80 900

Education

PhD in Technical Mathematics   September 2020
Institute of Discrete Mathematics and Geometry, TU Wien, Austria.

Thesis title: *Interactive Freeform Architectural Design with Nearly Developables and Cold Bent Glass*
Supervisor: Helmut Pottmann

MSc in Computational Science   September 2016
Department of Informatics & Telecommunications, National & Kapodistrian University of Athens.

Thesis title: *Implicitization, Interpolation and Syzygies*
Supervisor: Ioannis Emiris

BSc in Mathematics   July 2014
Department of Mathematics, National & Kapodistrian University of Athens.

Work Experience

TU Wien   Project Assistant
Vienna, Austria   September 2019 - present
Research assistant at the Applied Geometry group of the Institute of Discrete Mathematics and Geometry at TU Wien.

Evolute GmbH   ITN Marie Skłodowska-Curie Research Fellow
Vienna, Austria   September 2016 - August 2019
Three-year ITN Research Fellowship under the ARCADES project, Marie Skłodowska-Curie grant agreement No 675789.

SINTEF Digital   Invited PhD Student
Oslo, Norway   September - October 2018
Invited PhD Student of the Mathematics and Cybernetics department of the SINTEF Digital unit under the guidance of Tor Dokken and Georg Muntingh.

The focus of this two-month secondment was the adaptation of a Wasserstein generative adversarial network used in image inpainting to the problem of filling missing data in remote sensing applications, and in particular voids in digital elevation models. This project lead to the completion of item [2] in Publications.

Inria Sophia Antipolis - Méditerranée   Invited PhD Student
Sophia Antipolis, France   March - May 2018
Invited PhD Student of the AROMATH project team at Inria Sophia Antipolis - Méditerranée, under the guidance of Bernard Mourrain.

The focus of this three-month secondment was twofold. First, we studied the developability property of a surface S as an ideal generated by polynomial combinations of the coefficients of the control points of S. Secondly, we researched the formulation of the G^1-continuity constraint of neighboring spline surfaces as an optimization problem.

National & Kapodistrian University of Athens	Research Assistant
Athens, Greece	September 2014 - August 2016

Research assistant at the EρΓΑ Lab of the Department of Informatics and Telecommunications, National & Kapodistrian University of Athens, under the research program *Thales: Advanced Geometric Computing and Critical Applications*.

TEACHING EXPERIENCE

National & Kapodistrian University of Athens	Teaching Assistant
Athens, Greece	October 2014 - August 2016

Teaching assistant to the courses *Numerical Methods and Programming* offered at the Department of Chemistry [Fall 2014] and to *Algorithms and Complexity* offered at the Department of Informatics and Telecommunications [Spring 2015], National & Kapodistrian University of Athens.

RESEARCH EXPERIENCE

Publications

[1] **Computational Design of Cold Bent Glass Façades.**
K. Gavriil, R. Guseinov, J. Pérez, D. Pellis, P. Henderson, F. Rist, H. Pottmann, B. Bickel.
ACM Transactions on Graphics (Proc. *SIGGRAPH Asia* 2020), **39 (6)**, 208:1-208:16, 2020.
DOI: 10.1145/3414685.3417843 (*to appear*)

[2] **Void Filling of Digital Elevation Models with Deep Generative Models.**
K. Gavriil, G. Muntingh, O. J.D. Barrowclough.
IEEE Geoscience and Remote Sensing Letters, **16 (8)**, 1645-1649, 2019.
DOI: 10.1109/LGRS.2019.2902222

[3] **Optimizing B-spline surfaces for developability and paneling architectural freeform surfaces.**
K. Gavriil, A. Schiftner, H. Pottmann.
Computer-Aided Design, **111**, 29-43, 2019.
DOI: 10.1016/j.cad.2019.01.006

[4] **Interpolation of syzygies for implicit matrix representations.**
I. Emiris, K. Gavriil, and C. Konaxis.
7th International Conference on Algebraic Informatics, 2017.
Preprint: hal-01421866

[5] **Implicitization, interpolation, and syzygies.**
K. Gavriil.
Master's thesis (2016).
URL: https://pergamos.lib.uoa.gr/uoa/dl/frontend/file/lib/default/data/1321136/theFile

Short involvement

[6] **On the Stability of Generalized Second Price Auctions with Budgets**
J. Díaz, I. Giotis, L. Kirousis, E. Markakis, M. Serna. (2013)
LATIN 2014: Theoretical Informatics.
Preprint: arXiv:1309.6474

Guided research under Professor Lefteris Kirousis. My contribution was focused on the examination and proof of existence of the notions of stability in the proposed mechanisms for GSP auctions with budgets (see acknowledgements).

[7] **AMINESS: A Platform for Environmentally Safe Shipping**
T. Giannakopoulos, I. A. Vetsikas, I. Koromila, V. Karkaletsis, S. Perantonis. (2014)
Proceedings of *PETRA '14*.

URL: http://doi.acm.org/10.1145/2674396.2674464

My partial involvement and contribution was in researching an effective similarity measure to be used in ship trajectory clustering.

Various projects

3d Voronoi diagrams of iso-oriented cuboids under the L^1 norm   2015

Research and development of a CGAL function to compute the 3d Voronoi diagram of iso-oriented cuboids (`Iso_cuboid_3` class) using Nef polyhedra (`Nef_polyhedron_3` class) under the infinity norm. Part of the *Computational Geometry* postgraduate course, Spring 2015, University of Athens.

Conformation space of protein active sites   2015

An extension of the MSc thesis of Anaxagoras Fotopoulos and Thanos Papathanasiou on active site modelling through rotamer rotation. In particular, the effect of slight movements of $\alpha-$helices on the conformation space of the active site cavities is examined. Part of the *Algorithms in Structural Bioinformatics* postgraduate course, Spring 2015, University of Athens.

ACHIEVEMENTS

Fellowship   2016

Three-year ITN Marie Skłodowska-Curie Research Fellowship under the ARCADES project [grant agreement No 675789].

Scholarship   2016

One-year scholarship from the Department of Informatics and Telecommunications, National and Kapodistrian University of Athens.

Achievement Award   2016

Award for achieving the highest average grade [9.35/10.00] during the first year of MSc studies [2014-2015] in the *Computational Science* specialization, Department of Informatics and Telecommunications, National and Kapodistrian University of Athens.

CONFERENCES

Talks

- **ARCADES Doctoral School II and ESR Days** Barcelona, Spain. Sep 2018.
- **Inria PhD Seminar**. Sophia-Antipolis, France, May 2018.
- **Inria AROMATH Seminar**. Sophia-Antipolis, France. May 2018.
- **SIAM Conference on Industrial and Applied Geometry**. Pittsburgh, USA. Jul 2017.
- **International Conference on Algebraic Informatics 2017**. Kalamata, Greece. Jun 2017.

Posters

- **Solid and Physical Modeling 2018**. Bilbao, Spain. Jun 2018.
- **ARCADES First Software & Industrial Workshop, and Midterm Review**. Athens, Greece. Nov 2017.

ACTIVITIES

Reviewer

The Visual Computer, IEEE Geoscience and Remote Sensing Letters.

ESR representative   2016 - present

Representative of the Early Stage Researchers of the ARCADES project for the duration of the project.

Organizer

Co-organizer of the *ARCADES Doctoral School II and ESR Days*. Barcelona, Spain. Sep 2018.

National Mathematical Competions   2003 and 2004

Participated and qualified to the final stage, Archimedes, of the national mathematical competitions organized by the Hellenic Mathematical Society.

TECHNICAL SKILLS **Programming Languages**

Most experienced with C++, Python.
Familiar with Java, Haskell, Prolog.

Tools

Rhino, MS Visual Studio, LaTeX, Maple, MATLAB, MS Office.

LANGUAGES   **English** [Proficiency of Michigan and Cambridge, TOEFL: 109/120]
Greek [Native]
Russian [Intermediate speaking, reading. Basic writing]
German [Elementary, 1 year of studies]