

NIKOS PLATIS

Curriculum Vitae

February 2019

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## 1. Personal Information

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**Name/Surname:** Nikos Platis  
**Date of birth:** 28 May 1973  
**Work address:** University of the Peloponnese  
Department of Informatics and Telecommunications  
Academician G. K. Vlachos Street (New Building)  
GR-221 31 Tripolis  
Greece  
**Telephones:** +30 2710 372264 (work)  
+30 697 2864025 (mobile)  
**Email:** [nplatis@uop.gr](mailto:nplatis@uop.gr)  
**Website:** <http://users.uop.gr/~nplatis/>

## 2. Education

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2005 *PhD in Computer Science*  
Department of Informatics and Telecommunications, University of Athens  
1996 *MSc Information Technology (with Distinction)*  
Department of Computer Science / Department of Electronic & Electrical Engineering, University College London  
1995 *BSc in Mathematics (Mark: 8.3 / 10)*  
Department of Mathematics, University of Athens  
1991 Secondary education: Lycée Léonin (Graduation grade: 19.8 / 20)  
**Languages** *English* (excellent: Proficiency, TOEFL, license to teach in Greek schools)  
*French* (excellent: Sorbonne II, DALF, license to teach in Greek schools)

## 3. Scientific Interests

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- Computer Graphics
  - Simplification and multiresolution techniques
  - Intersection detection techniques
  - Graphics and general programming on the GPU
- Visualization
  - Information visualization: multidimensional data, uncertainty
  - Scientific data visualization: multidimensional data, simplification, GPU techniques
- Other interests
  - Object-oriented programming
  - Human-computer interaction, graphical user interfaces
  - Free and open source software

## 4. Professional Appointments

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- 02/2017 – today      *Assistant Professor in Computer Graphics and Visualization*  
Department of Informatics and Telecommunications, University of the Peloponnese.
- 04/2008 – 02/2017      *Lecturer in Computer Graphics and Data Visualization*  
Department of Informatics and Telecommunications, University of the Peloponnese.
- 09/2007 – 04/2008      *Adjunct Assistant Professor*  
Department of Computer Science and Technology, University of the Peloponnese.
- 09/2005 – 08/2007      *Adjunct Lecturer*  
Department of Computer Science and Technology, University of the Peloponnese.
- 09/2006 – 04/2008      *Teacher*  
International Baccalaureate Diploma Programme, Ziridis School.
- 02/2006 – 09/2006      *Adjunct Lecturer*  
Postgraduate Programme, Department of Informatics and Telecommunications, University of Athens.
- 09/2005 – 06/2006      *Instructor*  
Faculty of Higher Education for Police Officers.
- 02/2005 – 09/2005      *Adjunct Lecturer*  
Postgraduate Programme, Department of Informatics and Telecommunications, University of Athens.
- 11/2003 – 08/2004      *Military Service*  
Greek Air Force, specialization as Meteorologist (Observer).
- 09/2000 – 06/2001      *Instructor*  
School of Programmers of the Greek Army.
- 01/1997 – 01/1999      *Programmer / Analyst*  
Intrasoft S.A.

## 5. Research Collaborations

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- 2005 – today      *Member*  
Human-Computer Interaction and Virtual Reality Research Lab,  
Department of Informatics and Telecommunications,  
University of the Peloponnese.
- 2015 – today      *Member*  
Knowledge and Uncertainty Research Lab,  
Department of Informatics and Telecommunications,  
University of the Peloponnese.

2005 – today

*Research Fellow*

Computer Graphics Lab,  
Department of Informatics and Telecommunications,  
University of Athens.

## 6. Publications

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This section contains the titles of all my publications; their abstracts are given in Section 11. Citations to my publications are given in Section 12.

### 6.1 *Publications in Refereed Journals*

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- [J6] Alexandros Papageorgiou, Nikos Platis, *Triangular mesh simplification on the GPU*, The Visual Computer, 31(2), pp. 235–244 (2014) (Also in NASAGEM Geometry Processing Workshop, Computer Graphics International 2013). [9 citations]
- [J5] Andreas Papatheodorou, Nikos Platis, *Airline Deregulation, Market Conduct and Tort Liability*, Rivista di Politica Economica, I-II 2007, pp. 221–242 (2008). [2 citations]
- [J4] Nikos Platis, Theoharis Theoharis, *Progressive Hulls for Intersection Applications*, Computer Graphics Forum, 22(2), pp. 107–116 (2003). [5 citations]
- [J3] Nikos Platis, Theoharis Theoharis, *Fast Ray-Tetrahedron Intersection Using Plücker Coordinates*, journal of graphics tools, 8(4), pp. 37–48 (2003). [20 citations]
- [J2] Antonis Ramfos, Ralph Busse, Nikos Platis, Peter Fankhauser, *An Integration Framework for CORBA Objects*, Journal of the Society for Design and Process Science, 3(1), pp. 27–41 (1999). [2 citations]
- [J1] Christos Koukouvinos, Nikos Platis, Jennifer Seberry, *Necessary and sufficient conditions for some two variable orthogonal designs in order 36*, Congressus Numerantium, 114, pp. 129–139 (1996). [2 citations]

### 6.2 *Publications in Refereed Conference Proceedings*

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- [C8] Marinos Theodorakopoulos, Nikos Papageorgopoulos, Andriana Mourtis, Angeliki Antoniou, Manolis Wallace, George Lepouras, Costas Vassilakis, Nikos Platis, *Personalized Augmented Reality Experiences in Museums using Google Cardboards*, Proceedings of the 12<sup>th</sup> International Workshop on Semantic and Social Media Adaptation and Personalization Workshop – SMAP, Bratislava, Slovakia, pp. 95–100 (2017).
- [C7] Nikos Platis, Manolis Wallace, Thanos Triantos, *Visualization of Uncertainty in Tag Clouds*, Semantic Keyword-based Search on Structured Data Sources (Springer LNCS 9398) – Revised Selected Papers of the 1st KEYSTONE Conference, Coimbra, Portugal, pp. 127–132 (2015).
- [C6] Manolis Wallace, Nikos Platis, *The Uncertain Tag Cloud*, Proceedings of the 10<sup>th</sup> International Workshop on Semantic and Social Media Adaptation and Personalization Workshop – SMAP, Trento, Italy, pp. 71–75 (2015).
- [C5] Kostas Masselos, Costas Vassilakis, George Lepouras, Christos Tryfonopoulos, Nikolaos Tselikas, Nikos Platis, *A Mobile-Enabled Platform for Presenting and Disseminating Cultural Heritage Information Enhanced with Augmented Reality*, Pan-Hellenic Conference on Digital Cultural Heritage – EUROMED, Volos (2015).

- [C4] Dimitris Giouroukis, [Nikos Platis](#), Christos Tryfonopoulos, *PViz: Visualising P2P Multi-Agent Simulations*, International Conference on Autonomous Agents and Multiagent Systems – AAMAS (demo track), Istanbul, pp. 1945–1946 (2015).
- [C3] George Lepouras, Akrivi Katifori, Costas Vassilakis, Angeliki Antoniou, [Nikos Platis](#), *Towards a Learning Analytics Platform for Supporting the Educational Process*, The Fifth International Conference on Information, Intelligence, Systems and Applications – IISA, Crete, pp. 246–251 (2014). [6 citations]
- [C2] [Nikos Platis](#), Theoharis Theoharis, *Simplification of Vector Fields over Tetrahedral Meshes*, Proceedings of Computer Graphics International 2004, Crete, pp. 174–181 (2004). [3 citations]
- [C1] Antonis Ramfos, Ralph Busse, [Nikos Platis](#), Peter Fankhauser, *CORBA-Based Data Integration Framework*, Proceedings of the Third International Conference on Integrated Design and Process Technology (IDPT) – Vol. 2, International Workshop on Issues and Applications of Database Technology (IADT '98), Berlin, Germany (1998). [1 citation]

### 6.3 Books and Lecture Notes

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- [B6] George Lepouras, Angeliki Antoniou, [Nikos Platis](#), Dimitris Charitos, *Virtual Reality Systems Development*, HEAL (2015).
- [B5] Theoharis Theoharis, Georgios Papaioannou, [Nikos Platis](#), Nicholas Patrikalakis, *Graphics and Visualization: Principles and Algorithms* (Greek Edition), Symmetria (2010).
- [B4] Theoharis Theoharis, Georgios Papaioannou, [Nikos Platis](#), Nicholas Patrikalakis, *Graphics and Visualization: Principles and Algorithms*, A K Peters (2008).
- [B3] [Nikos Platis](#), *Programming Techniques*. Lecture notes for the course taught at the School of Programmers of the Greek Army (2000).
- [B2] Authorship of the chapter “Parametric Curves and Surfaces” and of other sections of the book: Theoharis Theoharis, Alexandros Boehm, *Computer Graphics: Principles and Algorithms* (1999).
- [B1] Contribution to the writing and production of the book: Nikos Christodoulakis, *Mathematics of Economic Analysis (Lecture Notes)*, Athens University of Economics and Business (1994).

### 6.4 Miscellaneous Publications

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- [M1] [Nikos Platis](#), Mihalis Tsoukalos, *GraphViz and C++*, C/C++ Users Journal, 23(12), pp. 38–42 (2005).

### 6.5 Theses

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- [T2] [Nikos Platis](#), *Multiresolution Techniques for the Simplification of Triangular and Tetrahedral Meshes*, PhD Thesis, University of Athens, Department of Informatics and Telecommunications. Supervisor: Theoharis Theoharis (2005).
- [T1] [Nikos Platis](#), *Curves and Surfaces Using GLOOP*, MSc Thesis, University College London. Supervisor: Mel Slater (1996).

## 7. Teaching

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The full curricula of the courses that I have taught are given in Section 13.

### 7.1 Postgraduate Courses

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#### **Data Visualization and Communication**

*MSc in Data Science, Athens University of Economics and Business*

#### **Field Prospection and Computing Technologies for Cultural Heritage**

*MSc in Cultural Heritage Materials and Technologies, University of the Peloponnese*

#### **Topics in Information Visualization**

*Department of Informatics and Telecommunications, University of the Peloponnese*

#### **Research Topics in Computer Graphics**

*Department of Informatics and Telecommunications, University of the Peloponnese*

#### **Programming Techniques**

*Department of Computer Science and Technology (Postgraduate Programme), University of the Peloponnese*

#### **Algorithm design and implementation**

*Department of Computer Science and Technology (Postgraduate Programme), University of the Peloponnese*

#### **Graphics and Visualization**

*Department of Computer Science and Technology (Postgraduate Programme), University of the Peloponnese*

#### **Graphics, Visualization, Fractals**

*Department of Informatics and Telecommunications (Postgraduate Programme), University of Athens*

### 7.2 Undergraduate Courses

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#### **Object-Oriented Programming**

*Department of Informatics and Telecommunications, University of the Peloponnese*

#### **Advanced Programming Topics**

*Department of Informatics and Telecommunications, University of the Peloponnese*

#### **Computer Graphics**

*Department of Informatics and Telecommunications, University of the Peloponnese*

#### **Data and Information Visualization**

*Department of Computer Science and Technology, University of the Peloponnese*

#### **Programming Principles**

*Department of Computer Science and Technology, University of the Peloponnese*

#### **Multimedia Technology**

*Department of Computer Science and Technology, University of the Peloponnese*

#### **Multimedia and Virtual Reality**

*Department of Computer Science and Technology, University of the Peloponnese*

#### **Introduction to Computer Science and Technology**

*Department of Computer Science and Technology, University of the Peloponnese*

#### **Information Technology and Management**

*Faculty of Higher Education for Police Officers*

## Programming Techniques

School of Programmers of the Greek Army

### 7.3 Supervision of Theses

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#### PhD theses

- 2017 – today Supervisor of the PhD thesis of M. Nastakou, *Fractals – Study and Visualization*, Department of Informatics and Telecommunication, University of the Peloponnese (co-supervisor: V. Drakopoulos, Department of Computer Science and Biomedical Informatics, University of Thessaly).
- 2014 – today Member of the advisory board for the PhD thesis of S. Kontogeorgakos, *Creation of User Profiles through Games*, Department of Informatics and Telecommunication, University of the Peloponnese (supervisor: G. Lepouras).
- 2014 – today Member of the advisory board for the PhD thesis of K. Kalampokis, *Algorithms for Inverse Lighting Problems*, Department of Informatics, Athens University of Economics and Business (supervisor: G. Papaioannou).
- 2012 – today Member of the advisory board for the PhD thesis of G. Kouyoumtzoglou, *Virtual Reality Environments with Applications on Security Issues*, Department of Informatics and Telecommunication, University of the Peloponnese (supervisor: G. Lepouras).
- 2012 – 2016 Member of the advisory board for the PhD thesis of K. Vardis, *Real time production of cinematic quality virtual environments*, Department of Informatics, Athens University of Economics and Business (supervisor: G. Papaioannou).

#### Postgraduate Theses

- 2018 D. Spyrelis, *Reporting & Advanced Visualization of Match/Teams' Results*. MSc in Data Science, Athens University of Economics and Business.
- 2013 M. Nastakou, *L-Systems and implementation in Scratch*.
- 2013 S. Choraiti, *Game Theory and optimization problems*.
- 2012 A. Papageorgiou, *Simplification of triangular models on the GPU*.
- 2010 A. Danelakis, E. Saiti, *Ray casting of tetrahedral meshes on the GPU*. Computer Graphics Lab, Department of Informatics and Telecommunications, University of Athens.
- 2001 A. Agathos, *Surface Reconstruction and Simplification*. Computer Graphics Lab, Department of Informatics and Telecommunications, University of Athens (in collaboration with Associate Prof. T. Theoharis).

#### Graduate Theses

- 2017 A. Vamvakaris, *A system for the management of graduate theses assignment*.
- 2016 G. Lakkas, *A system for the support of a private medical practice*.
- 2016 G. Parthenios, *A system for the management of graduate theses assignment*.
- 2015 C. Tziastas, *A system for the support of a private medical practice*.



- 2013 D. Giouroukis, *ChordViz, a Chord protocol visualization* (in collaboration with Assist. Professor Chr. Tryfonopoulos).
- 2013 G. Kallivokas, *Visualization methods for text corpora analysis tools*.
- 2012 A.-I. Kolios, *Implementation and Comparison of Ray-Tetrahedron Intersection Algorithms on the GPU*.
- 2006 A. Danelakis, E. Saiti, *Multiresolution Visualization of Vector Fields over Tetrahedral Meshes*. Computer Graphics Lab, Department of Informatics and Telecommunications, University of Athens.
- 2002 A. Vlachou, A. Dellis, *Visualization of 4D Fractal Sets Using Multiresolution Techniques*. Computer Graphics Lab, Department of Informatics and Telecommunications, University of Athens (in collaboration with Associate Prof. T. Theoharis and Dr V. Drakopoulos).

## **7.4 Teaching Assistance**

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### **Computer Graphics I**

*Department of Informatics and Telecommunications, University of Athens*

### **Introduction to Programming**

*Department of Informatics and Telecommunications, University of Athens*

### **Computer Science I**

*Department of Mathematics, University of Athens*

### **Computer Lab**

*Department of Mathematics, University of Athens*

## **7.5 Secondary Education Teaching**

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### **Computer Science (Standard Level / High Level)**

*International Baccalaureate Diploma Programme, Ziridis School*

## 8. Administrative Duties

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- 2013 – today *Member of the **Undergraduate Studies Committee** of the Department of Informatics and Telecommunications, University of the Peloponnese. The Committee shaped the **Curriculum** of the new Department as well as the **Transitional Provisions** for the old students.*
- 2013 – today *Responsible for the **maintenance** of the guides concerning the undergraduate studies at the Department of Informatics and Telecommunications: Undergraduate Studies Guide, Transitional Provisions Guide, Guide of Procedures, Regulation of Undergraduate Thesis.*
- 2013 – today *Member of the **Departmental Assembly**, Department of Informatics and Telecommunications, University of the Peloponnese.*
- 2008 – 2013 *Member of the **Provisional Departmental Assembly**, Department of Computer Science and Technology, University of the Peloponnese.*
- 2009 – 2012 *Member of the **Internal Evaluation Committee** of the Department of Computer Science and Technology, University of the Peloponnese. **Coordinator** of the **Internal Evaluation Report** of the Department (2010) and of the **Yearly Statistical Reports** (2009-2011).*
- 2010 – 2013 ***Coordinator** and **co-author** of the **Guide of Procedures** of the Department of Computer Science and Technology. This guide contains material on academic ethics, on the administrative procedures of the Department, and on the regulations for the exams and the final-year project*
- 2008 – 2011 *Member of **electoral bodies** for faculty positions at the Department of Computer Science and Technology, University of the Peloponnese.*
- 2010 – 2016 ***Faculty sponsor** of the **ACM Student Chapter** at the University of the Peloponnese.*
- 2009 – 2013 *Responsible for **assigning undergraduate theses** to the students of the Department of Computer Science and Technology.*
- 2010 – today *Member of the committee **overseeing the maintenance of the student computer labs** of the Department of Computer Science and Technology / Informatics and Telecommunications.*
- 2012 – today *Member or **substitute member** of **administrative committees** at the University of the Peloponnese: Evaluation of tenders for procurement of equipment and services, etc.*

## 9. Research and Development Projects

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2018 – 2020	<b>Scientific Coordinator</b> of the project “Creation and Management of a Destination Management System at Prefectural Level” (funded by the Prefecture of the Peloponnese).
2017 – 2022	<b>Departmental coordinator</b> for the Department of Informatics and Telecommunications of the project “Student Traineeships for the University of the Peloponnese” (funded by the EU Partnership Agreement (ΕΣΠΑ) 2014 – 2020).
2016 – 2019	Member of the implementation team of the project “CrossCult: Empowering reuse of digital cultural heritage in context-aware crosscuts of European history” (Horizon 2020).
2013 – 2015	Member of the implementation team of the project “Innovative Web/Mobile GIS/LBS e-Services with Augmented Reality Features for the Tourism Sector” (funded by the Greek General Secretariat of Research and Technology (GSRT)).
2013 – 2015	Member of the implementation team of the project “Information System of the Quality Assurance Unit of the University of the Peloponnese”.
2013 – 2015	<b>Technical Manager</b> of the project “Open Courses at the University of the Peloponnese” (funded by the GSRT).
1998 – 1999	Participation in the research programme “Multiresolution processing of polygonal models” (funded by the University of Athens).

## 10. Scientific Recognition

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### 10.1 *Referee for Scientific Journals*

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- Social Network Analysis and Mining (Springer) — Special Issue on “Semantic Social Networks and Media” (2017).
- Computer Animation and Virtual Worlds (2016).
- Computer-Aided Design (2010).
- Computing in Science & Engineering (2010).
- Journal of Computing and Information Science in Engineering (2007).
- Virtual Reality (Springer) — Special Issue on “Virtual Reality in the e-Society” (2007).

### 10.2 *Member of the Review Board of Scientific Conferences*

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- CGI (Computer Graphics International) 2005, 2010, 2015.
- WSCG (International Conferences in Central Europe on Computer Graphics, Visualization and Computer Vision), 2006–2016.
- 14th Panhellenic Congress on Informatics (2010).
- Eurographics 2008 STAR (State of the Art) Reports.
- GRAPP (International Conference on Computer Graphics Theory and Applications) 2006, 2007.
- IEEE Visualization 2006.

### 10.3 *Examiner of Research Proposals and Projects*

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- Member of boards for the **certification of the progress and completion of projects** financed by programmes of the Greek General Secretariat of Research and Technology (GSRT):
  - Action “Co-operation 2009” (2014–2015)
  - Action “Creation and support of new innovating enterprises, mostly knowledge-intensive (Spin-off and Spin-out)” (2015)
- Member of boards for the **examination of research proposals** for programmes of the Greek General Secretariat of Research and Technology (GSRT):
  - Action “Support of New Enterprises for Research & Technological Development” (2012)

### 10.4 *Examiner of Theses*

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#### PhD Theses

Member of the examination committee of the following PhD theses:

- 2013 P. Mavridis, *Efficient Texture Representation and Sampling Algorithms for Real-time Rendering*, Department of Informatics, Athens University of Economics and Business.
- 2009 E. Giannopoulou, *Integration and Visualization of Proteomics Data*, Department of Computer Science and Technology, University of the Peloponnese.

#### Postgraduate Theses

Member of the examination committee of 15 postgraduate theses at the following departments:

- Department of Informatics and Telecommunication, University of the Peloponnese (4)
- Department of Informatics, Athens University of Economics and Business (4)
- Department of Computer and Information Science, NTNU (7)

#### Graduate Theses

Member of the examination committee of 10 graduate theses at the Department of Informatics and Telecommunication, University of the Peloponnese.

### 10.5 *Invited Talks*

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- **May 2006:** University of Ioannina, Department of Computer Science. Talk entitled *Multiresolution Techniques for the Simplification of 3D Vector Fields* during a one-day seminar on Computer Graphics.

### 10.6 *Member of Scientific Societies*

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- ACM
- SIGGRAPH
- Hellenic Mathematical Society

### 10.7 *Academic Distinctions*

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- 1996 My Thesis for the MSc in Information Technology was awarded the highest grade among all MSc students of my class (86 / 100).
- 1992, 1993, 1994 Honorary scholarship from the Greek Scholarship Foundation awarded to the three highest ranked students of the Department of Mathematics.
- 1990 First prize in a nationwide contest for an essay in French, organized by the

Alliance Française.

## 11. Publication Abstracts

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### 11.1 Publications in Refereed Journals

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- [J6] Alexandros Papageorgiou, Nikos Platis, *Triangular mesh simplification on the GPU*, *The Visual Computer*, 31(2), pp. 235–244 (2014) (Also in NASAGEM Geometry Processing Workshop, Computer Graphics International 2013). [5 citations]

We present a simplification algorithm for triangular meshes, implemented on the GPU. The algorithm performs edge collapses driven by a quadric error metric. It uses data parallelism as provided by OpenCL and has no sequential segments in its main iterative structure in order to fully exploit the processing power of the GPU. Our implementation produces results faster than a corresponding sequential implementation and the resulting models are of comparable quality.

- [J5] Andreas Papatheodorou, Nikos Platis, *Airline Deregulation, Market Conduct and Tort Liability*, *Rivista di Politica Economica*, I-II 2007, pp. 221–242 (2008). [2 citations]

Air traffic has increased substantially since the introduction of deregulation in both the USA and the European Union. Moreover, aircraft accidents involving fatalities have exhibited a downward trend over time. Still, a series of recently publicized accidents has raised again a serious issue, namely whether cost reduction in a deregulated aviation environment is achieved at the expense of safety standards. To address this question, the paper proposes a mathematical model, which highlights the relationship between competitive behaviour and tort liability. The model has important policy implications suggesting that the level of airline penalisation should be reduced when the market conduct is restricted and conversely.

- [J4] Nikos Platis, Theoharis Theoharis, *Progressive Hulls for Intersection Applications*, *Computer Graphics Forum*, 22(2), pp. 107–116 (2003). [4 citations]

Progressive meshes are an established tool for triangle mesh simplification. By suitably adapting the simplification process, progressive hulls can be generated which enclose the original mesh in gradually simpler, nested meshes. We couple progressive hulls with a selective refinement framework and use them in applications involving intersection queries on the mesh. We demonstrate that selectively refinable progressive hulls considerably speed up intersection queries by efficiently locating intersection points on the mesh. Concerning the progressive hull construction, we propose a new formula for assigning edge collapse priorities that significantly accelerates the simplification process, and enhance the existing algorithm with several conditions aimed at producing higher quality hulls. Using progressive hulls has the added advantage that they can be used instead of the enclosed object when a lower resolution of display can be tolerated, thus speeding up the rendering process.

- [J3] Nikos Platis, Theoharis Theoharis, *Fast Ray-Tetrahedron Intersection Using Plücker Coordinates*, *Journal of graphics tools*, 8(4), pp. 37–48 (2003). [16 citations]

We present an algorithm for ray-tetrahedron intersection. The algorithm uses Plücker coordinates to represent the ray and the edges of the tetrahedron and employs a robust and efficient test to determine the intersection. The algorithm is highly optimized and provides a significant performance increase over related algorithms.

- [J2] Antonis Ramfos, Ralph Busse, Nikos Platis, Peter Fankhauser, *An Integration Framework for CORBA Objects*, *Journal of the Society for Design and Process Science*, 3(1), pp. 27–41 (1999). [2 citations]

This paper presents the results of research work in the field of heterogeneous database integration. The CORBA architecture is used for constructing generalized interfaces for accessing heterogeneous data sources, for combining them, and for the transparent user access to them.

This is an expanded version of paper [C1], selected for publication in the *Journal of the Society for Design and Process Science*.

- [J1] Christos Koukouvinos, [Nikos Platis](#), Jennifer Seberry, *Necessary and sufficient conditions for some two variable orthogonal designs in order 36*, *Congressus Numerantium*, 114, pp. 129–139 (1996). [1 citation]

This paper contains the results of research work in the field of combinatorial designs. We study two-variable orthogonal designs of order 36, and by combining their theoretical properties with exhaustive search we declare conditions for their existence.

## ***11.2 Publications in Refereed Conference Proceedings***

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- [C8] Marinos Theodorakopoulos, Nikos Papageorgopoulos, Andriana Mourtis, Angeliki Antoniou, Manolis Wallace, George Lepouras, Costas Vassilakis, [Nikos Platis](#), *Personalized Augmented Reality Experiences in Museums using Google Cardboards*, Proceedings of the 12<sup>th</sup> International Workshop on Semantic and Social Media Adaptation and Personalization Workshop – SMAP, Bratislava, Slovakia, pp. 95–100 (2017).

In this paper we examine the suitability of the Google Cardboard as a means for the delivery of personalized cultural experiences. Specifically, we develop the content and create the application required in order to provide highly personalized visits to the Archaeological Museum in Tripolis, Greece. We also examine the usability issues related to the use of Google Cardboards. Early results are promising, and based on them we also outline the next steps ahead.

- [C7] [Nikos Platis](#), Manolis Wallace, Thanos Triantos, *Visualization of Uncertainty in Tag Clouds, Semantic Keyword-based Search on Structured Data Sources (Springer LNCS 9398) – Revised Selected Papers of the 1st KEYSTONE Conference*, Coimbra, Portugal, pp. 127–132 (2015).

Tag clouds provide an excellent means of visualization of weighted semantic information. With their generation depending on given or calculated weights, their use is not possible when these weights are not known with certainty. In this paper we propose an extension of tag clouds to support the notion of uncertainty and explore some properties of this new representation. Furthermore, we present a tool implementing it.

- [C6] Manolis Wallace, [Nikos Platis](#), *The Uncertain Tag Cloud*, Proceedings of the 10<sup>th</sup> International Workshop on Semantic and Social Media Adaptation and Personalization Workshop – SMAP, Trento, Italy, pp. 71–75 (2015).

Tag clouds provide an excellent means of visualization of weighted semantic information. When, on the other hand, this information is not definitive but is rather accompanied by a measurable degree of uncertainty, conventional tag clouds are no longer suitable visualization tools. In this paper we extend the conventional approach to tag cloud generation and propose the utilization of the degree of opacity as a means to visualize the degree of certainty. In order to experimentally assess the efficacy of the proposed approach we have developed the corresponding software tools and have applied the conventional and proposed approaches to tag visualization in a real life scenario of probabilistic data.

- [C5] Kostas Masselos, Costas Vassilakis, George Lepouras, Christos Tryfonopoulos, Nikolaos Tselikas, [Nikos Platis](#), *A Mobile-Enabled Platform for Presenting and Disseminating Cultural Heritage Information Enhanced with Augmented Reality*, Pan-Hellenic Conference on Digital Cultural Heritage – EUROMED, Volos (2015).

The advent of mobile technologies has created opportunities for more effective delivery of cultural heritage information to all interested parties, and especially tourists who are on-the-move. Many people nowadays are equipped with smartphones or tablets equipped with location tracking devices such as GPS and compasses and having internet access available; these smartphones can be used for efficient delivery of cultural heritage information, in a personalized and timely fashion. Moreover, the computing resources of these smartphones are adequate to enable the use of augmented reality techniques, which provide a lively and engaging experience to the users. However, the same content still needs to be disseminated to users of stationary computers. In this paper, we report on the design and development of a mobile-enabled platform for presenting and disseminating cultural heritage information enhanced with augmented reality and integration with social networks.

- [C4] Dimitris Giouroukis, [Nikos Platis](#), Christos Tryfonopoulos, *PViz: Visualising P2P Multi-Agent Simulations*, International Conference on Autonomous Agents and Multiagent Systems – AAMAS (demo track), Istanbul, pp. 1945–1946 (2015).

Simulators are an inseparable part of the design and evaluation of distributed multi-agent protocols. In this work we put forward PViz, a novel visualisation tool built for one of the most prominent, publicly available P2P simulators, PeerSim. Our tool provides network visualisation for different overlays, interaction with the simulation through scenario re-playability and stepwise execution, and intuitive visualisation features such as panning and zooming in/out of the network, color-coding of nodes, and event alerting.

- [C3] George Lepouras, Akrivi Katifori, Costas Vassilakis, Angeliki Antoniou, [Nikos Platis](#), *Towards a Learning Analytics Platform for Supporting the Educational Process*, The Fifth International Conference on Information, Intelligence, Systems and Applications – IISA, Crete, pp. 246–251 (2014). [3 citations]

In this paper, we present the vision of an open source learning analytics platform, able to harvest data from different sources, including e-learning platforms and environments, registrar's information systems, alumni systems, etc., so as to provide all stakeholders with the necessary functionality to make decisions on the learning process. The platform's architecture is modular, allowing the introduction of new functionality or connection to new systems to collect needed data. All data can be analyzed and presented through interactive visualizations to find correlations between metrics, to make predictions for students or student groups, to identify best practices for instructors and let them explore 'what-if' scenarios, to offer students personalized recommendations and personalized detailed feedback, etc. Our objective is to inform and empower all stakeholders to improve the learning experience.

- [C2] [Nikos Platis](#), Theoharis Theoharis, *Simplification of Vector Fields over Tetrahedral Meshes*, Proceedings of Computer Graphics International 2004, Crete, pp. 174–181 (2004). [3 citations]

Vector fields produced by experiments or simulations are usually extremely dense, which makes their manipulation and visualization cumbersome. Often, such fields can be simplified without much loss of information. A simplification method for 3D vector fields defined over tetrahedral meshes is presented. The underlying tetrahedral mesh is progressively simplified by successive half-edge collapses. The order of collapses is determined by a compound metric which takes into account the field and domain error incurred as well as the quality of the resulting mesh. Special attention is given to the preservation of the mesh boundary and of critical points on the vector field. A tool has been developed for the measurement of the difference between two vector fields over tetrahedral meshes, and it is used to quantify the simplification error.

- [C1] Antonis Ramfos, Ralph Busse, [Nikos Platis](#), Peter Fankhauser, *CORBA-Based Data Integration Framework*, Proceedings of the Third International Conference on Integrated Design and Process Technology (IDPT) – Vol. 2, International Workshop on Issues and Applications of Database Technology (IADT '98), Berlin, Germany (1998). [1 citation]

This paper presents the results of research work in the field of heterogeneous database integration. The CORBA architecture is used for constructing generalized interfaces for accessing heterogeneous data sources, for combining them, and for the transparent user access to them.

### 11.3 Books and Lecture Notes

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- [B6] George Lepouras, Angeliki Antoniou, [Nikos Platis](#), Dimitris Charitos, *Development of Virtual Reality Systems*, HEAL (2015).

This textbook was developed within the “Kallipos” initiative. It aims to present the theoretical background, the technologies, the design, implementation and evaluation techniques as well as applications of Virtual Reality systems. This textbook is addressed to both undergraduate and postgraduate students who wish to become familiar with the development of Virtual Reality systems. It covers all the related topics of Mathematics, Electrical Engineering, Ergonomics, Psychology and Computer Science that are necessary to understand the specificities of developing a Virtual Reality system.

- [B5] Theoharis Theoharis, Georgios Papaioannou, [Nikos Platis](#), Nicholas Patrikalakis, *Graphics and Visualization: Principles and Algorithms* (Greek Edition), Symmetria (2010).

This is the Greek edition of the book [B4]. Translation and book production by the authors. This book is replacing [B2] as the textbook of choice for Graphics courses in Greek universities.



[B4] Theoharis Theoharis, Georgios Papaioannou, Nikos Platis, Nicholas Patrikalakis, *Graphics and Visualization: Principles and Algorithms*, A K Peters (2008).

This book is a comprehensive visual computing textbook, dealing with the modeling and synthesis of visual data by means of computers. The book is aimed at undergraduate and graduate students taking computer graphics and visualization courses. The book concentrates on established principles and algorithms as well as novel methods that are likely to leave a lasting mark on the subject.

The book has been adopted as the textbook of several Graphics and Visualization courses in universities worldwide.

[B3] Nikos Platis, *Programming Techniques*. Lecture notes for the course taught at the School of Programmers of the Greek Army (2000).

Contents: General elements of programming languages — Structured programming (basic commands, expressions, control and iteration structures, arrays) — Pseudocode, flow diagrams — Procedures, functions, recursion — Searching and sorting algorithms.

[B2] Authorship of the chapter “Parametric Curves and Surfaces” and of other sections of the book: Theoharis Theoharis, Alexandros Boehm, *Computer Graphics: Principles and Algorithms* (1999).

Until the publication of [B5], this was the most complete and current Greek book on Computer Graphics. The book covers a broad material, from basic mathematical principles, geometric transformations and two-dimensional algorithms, to advanced lighting algorithms and animation. It was used as the main textbook in most Graphics courses offered by universities in Greece.

Chapter contents: Bézier curves — B-Spline curves — Interpolation curves — Bézier, B-Spline, Interpolation surfaces.

[B1] Contribution to the writing and production of the book: Nikos Christodoulakis, *Mathematics of Economic Analysis (Lecture Notes)*, Athens University of Economics and Business (1994).

Book contents: Vector spaces — Matrices — Complex numbers — Basic elements of Topology — Real functions of one and multiple variables — Optimisation — Differential equations — Applications in Economics.

#### 11.4 *Miscellaneous Publications*

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[M1] Nikos Platis, Mihalis Tsoukalos, *GraphViz and C++*, C/C++ Users Journal, 23(12), pp. 38–42 (2005).

GraphViz is a set of programs for graph visualization. Its capabilities are available to C++ through the Boost Graph Library (BGL). In this article we present an introduction to the use of GraphViz as well as examples of graphs constructed programmatically, in C++ and BGL, and visualized using GraphViz. The examples employ advanced object oriented programming techniques and utilize other parts of the Boost library.

#### 11.5 *Theses*

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[T2] Nikos Platis, *Multiresolution Techniques for the Simplification of Triangular and Tetrahedral Meshes*, PhD Thesis, University of Athens, Department of Informatics and Telecommunications. Supervisor: Theoharis Theoharis (2005).

This thesis studies the simplification of triangular and tetrahedral meshes by the use of techniques based on successive edge collapses, as well as the exploitation of the generated multiple levels of detail (progressive meshes) for the effective processing of the models. Regarding triangular meshes, a method for the construction of progressive hulls by suitable edge collapses is presented. The generated hulls are used for the acceleration of intersection tests between the initial mesh and a line. Regarding tetrahedral meshes, meshes with associated vector fields are simplified. Progressive tetrahedral meshes are constructed by taking into account, while collapsing edges, both the geometry of the mesh and the associated field. Finally, an efficient algorithm for computing ray-tetrahedron intersection is presented, which exploits Plücker coordinates to accelerate computations; this algorithm may be used for the efficient processing of progressive tetrahedral meshes.

[T1] Nikos Platis, *Curves and Surfaces Using GLOOP*, MSc Thesis, University College London. Supervisor: Mel Slater (1996).

This thesis studies Bézier and B-Spline parametric curves and surfaces, their properties and methods for their computation. Furthermore, algorithms for their display are developed, using object-oriented techniques integrated with the GLOOP library used at the Department of Computer Science, University College London, for teaching Computer Graphics courses.

## 12. Citations

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There are 50 verified citations (excluding self-citations) of my published papers, as shown below. Citations of the books that I have co-authored are not counted.

### 12.1 Publications in Refereed Journals

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- [J6] Alexandros Papageorgiou, Nikos Platis, *Triangular mesh simplification on the GPU*, The Visual Computer, 31(2), pp. 235–244 (2014) (Also in NASAGEM Geometry Processing Workshop, Computer Graphics International 2013).
1. Muhammad Naveed Akhtar, Muhammad Hanif Durad, Anila Usman, Muhammad Abid Mughal, *Efficient Memory Access Patterns for Solving 3D Laplace Equation on GPU*, Iranian Journal of Science and Technology, Transactions A: Science (2016).
  2. Hyunho Lee, Min-Ho Kyung, *Parallel mesh simplification using embedded tree collapsing*, The Visual Computer, 32(6), pp. 967–976 (2016).
  3. Nuttapon Chentanez, Matthias Müller, Miles Macklin, *GPU accelerated grid-free surface tracking*, Computers & Graphics, 57, pp. 1–11 (2016).
  4. Thomas Odaker, *Adaptive Vereinfachung von Dreiecksnetzen in Echtzeit [Adaptive simplification of triangular meshes in real time]*, PhD Thesis, Fakultät für Mathematik, Informatik und Statistik, Ludwig-Maximilians-Universität München (2016).
  5. Thomas Odaker, Dieter Kranzlmüller, Jens Volkert, *GPU-Accelerated Triangle Mesh Simplification Using Parallel Vertex Removal*, International Journal of Computer, Electrical, Automation, Control and Information Engineering, 10(1), pp. 160–166 (2016).
  6. Thomas Odaker, Dieter Kranzlmüller, Jens Volkert, *View-dependent Simplification using Parallel Half Edge Collapses*, Proceedings of WSCG 2015, pp. 63–72 (2015).
  7. Xiaodong Che, Yu Niu, Bin Shui, Jianbo Fu, Guangzheng Fei, Prashant Goswami, Yanci Zhang, *A novel simulation framework based on information asymmetry to evaluate evacuation plan*, The Visual Computer, 31(6–8), pp. 853–861 (2015).
  8. Iván Yerko Rojas Hernández, *Optimization and parallelization of an algorithm for the generation of skeletons from geometric meshes applied in biological structures [Optimización y paralelización de un algoritmo de generación de skeletons a partir de mallas geométricas aplicado a estructuras biológicas]*, BEng Thesis, Departamento De Ciencias de la Computación, Univesidad De Chile (2014).
  9. V.I. Gonakhchyan, *Survey of polygonal surface simplification algorithms on GPU*, Proceedings of the Institute for System Programming of RAS, 26(2), pp. 159–174 (2014).
- [J5] Andreas Papatheodorou, Nikos Platis, *Airline Deregulation, Market Conduct and Tort Liability*, Rivista di Politica Economica, I-II 2007, pp. 221–242 (2008).
10. Adam Pawlicz, *Economic Rationale for Licensing Tour Guides in Poland*, Tourism in Southern and Eastern Europe, pp. 295–304 (2013).
  11. Guido Candela, Paolo Figini, *The Economics of Tourism Destinations*, Springer (2012).
- [J4] Nikos Platis, Theoharis Theoharis, *Progressive Hulls for Intersection Applications*, Computer Graphics Forum, 22(2), pp. 107–116 (2003).
12. Andre Gaschler, *Efficient Geometric Predicates for Integrated Task and Motion Planning*, PhD Thesis, Technische Universität München, Germany (2016).
  13. Andre Gaschler, Quirin Fischer, Alois Knoll, *The Bounding Mesh Algorithm*, Technical Report TUM-I1522, Technische Universität München, Germany (2015).
  14. Leonardo Sacht, Etienne Vouga, Alec Jacobson, *Nested Cages*, ACM Transactions on Graphics, 34(6) (2015).
  15. Liu Tao, Feng Jie-Qing, Chen Xue, *Cage Generation Based on Visual Hull*, Journal of Software, 24(10), pp. 2379–2390 (2013).

16. David Cholt, *Progressive Hulls: Application on Biomedical Data*, Proceedings of CESC 2012: The 16th Central European Seminar on Computer Graphics (2012).
- [J3] Nikos Platis, Theoharis Theoharis, *Fast Ray-Tetrahedron Intersection Using Plücker Coordinates*, journal of graphics tools, 8(4), pp. 37–48 (2003).
17. Esteban Rangel, Nan Li, Salman Habib, Tom Peterka, Ankit Agrawal, Wei-Keng Liao, Alok Choudhary, *Parallel DTFE Surface Density Field Reconstruction*, 2016 IEEE International Conference on Cluster Computing (CLUSTER), pp. 30–39 (2016).
18. Jan Březina, Pavel Exner, *Fast Intersection of Nonmatching Meshes Using Plücker Coordinates*, Proceedings of ESCO 2016 (2016).
19. John E Gillam, Georgios I Angelis, Steven R Meikle, *List-mode image reconstruction for positron emission tomography using tetrahedral voxels*, Physics in Medicine and Biology, 61, pp. N497, (2016).
20. Petru Manescu, Hamid Ladjal, Joseph Azencot, Michael Beuve, Behzad Shariat, *Motion compensation for PET image reconstruction using deformable tetrahedral meshes*, Journal of Physics in Medicine and Biology, 60(24), p. 9269 (2015).
21. Jundong Tan, Zhuo Su, Yunliang Long, *A Full 3-D GPU-based Beam-Tracing Method for Complex Indoor Environments Propagation Modeling*, IEEE Transactions on Antennas and Propagation 63(6), pp. 2705–2718 (2015).
22. Christoph Böcklin, Dirk Baumann, Jürg Fröhlich, *New approach for absolute fluence distribution calculations in Monte Carlo simulations of light propagation in turbid media*, Journal of Applied Physics 115, 064905 (2014).
23. Christoph Böcklin, *Modelling light propagation in tissue*, PhD Thesis, ETH Zurich (2014).
24. Goretti Echegaray, Imanol Herrera, Iker Aguinaga, Carlos Buchart, Diego Borro, *A Brain Surgery Simulator*, IEEE Computer Graphics and Applications 34(3), pp. 12–18 (2014).
25. Imanol Herrera, Carlos Buchart, Iker Aguinaga, Diego Borro, *Study of a Ray Casting Technique for the Visualization of Deformable Volumes*, IEEE Transactions on Visualization and Computer Graphics 20(11), pp. 1555–1565 (2014).
26. Imanol Herrera, *Volumetric Visualization Techniques of Rigid and Deformable Models for Surgery Simulation*, PhD Thesis, University of Navarra (2013).
27. Qianqian Fang, *Comment on "A study on tetrahedron-based inhomogeneous Monte-Carlo optical simulation"*, Biomedical Optics Express 2(5), pp. 1258–1264 (2011).
28. B.M. Smith, *Robust Tracking and Advanced Geometry for Monte Carlo Radiation Transport*, PhD Thesis, University of Winsconsin (2011).
29. Haiou Shen, Ge Wang, *A study on tetrahedron-based inhomogeneous Monte Carlo optical simulation*, Biomedical Optics Express 2(1), pp. 44–57 (2011).
30. Ahmad Hosney Awad Eid, *Optimized Automatic Code Generation for Geometric Algebra Based Algorithms with Ray Tracing Application*, PhD Thesis, Department of Electrical Engineering, Philadelphia University, Jordan (2010).
31. Qianqian Fang, *Mesh-based Monte Carlo method using fast ray-tracing in Plücker coordinates*, Biomedical Optics Express 1(1), pp. 165–175 (2010).
32. Gerd Marmitt, Heiko Friedrich, Philipp Slusallek, *Efficient CPU-based Volume Ray Tracing Techniques*, Computer Graphics Forum 27(6), pp. 1687–1709 (2008).
33. Ares Lagae, Philip Dutré, *Accelerating Ray Tracing using Constrained Tetrahedralizations*, Computer Graphics Forum 27(4), pp. 1303–1312 (2008).
34. Gerd Marmitt, Heiko Friedrich, Philipp Slusallek, *Interactive Volume Rendering with Ray Tracing*, Eurographics STAR – State of the Art Report (2006).
35. Gerd Marmitt, Philipp Slusallek, *Fast Ray Traversal of Tetrahedral and Hexahedral Meshes for Direct Volume Rendering*, Proceedings of the joint Eurographics / IEEE-VGTC Symposium on Visualization, pp. 235–242 (2006).
36. Gerd Marmitt, Heiko Friedrich, Philipp Slusallek, *Recent Advancements in Ray tracing-based Volume Rendering Techniques*, Proceedings of Vision, Modelling and Visualization – VMV (2005).
- [J2] Antonis Ramfos, Ralph Busse, Nikos Platis, Peter Fankhauser, *An Integration Framework for CORBA Objects*, Journal of the Society for Design and Process Science, 3(1), pp. 27–41 (1999).
37. Marko Rosić, Vlado Glavinić, Slavomir Stankov, *Intelligent tutoring interoperability for the new web*, Telecommunication Systems, 32(2–3), pp. 193–207 (2006).

38. Luiz Fernando Bessa Seibel, *Bio-AXS: An Architecture for Integrating Data Sources and Applications of Molecular Biology* [*Bio-AXS: Uma Arquitetura para Integração de Fontes de Dados e Aplicações de Biologia Molecular*], PhD Thesis, Departamento de Informática, Pontifícia Universidade Católica do Rio de Janeiro (2000).
- [J1] Christos Koukouvinos, Nikos Platis, Jennifer Seberry, *Necessary and sufficient conditions for some two variable orthogonal designs in order 36*, *Congressus Numerantium*, 114, pp. 129–139 (1996).
39. Stelios D. Georgiou, *New two-variable full orthogonal designs and related experiments with linear regression models*, *Statistics & Probability Letters*, 77(1), σελ. 25–31 (2007).
40. Charles J. Colbourn, Jeffrey H. Dinitz (editors), *The CRC Handbook of Combinatorial Designs*, 1st ed., CRC Press (1996).

## 12.2 Publications in Refereed Conference Proceedings

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- [C3] George Lepouras, Akrivi Katifori, Costas Vassilakis, Angeliki Antoniou, Nikos Platis, *Towards a Learning Analytics Platform for Supporting the Educational Process*, The Fifth International Conference on Information, Intelligence, Systems and Applications – IISA, Crete, pp. 246–251 (2014).
41. Y. Vanessa Niet, V. G. Díaz and C. E. Montenegro, *Academic decision making model for higher education institutions using learning analytics*, 4th International Symposium on Computational and Business Intelligence (ISCBI), pp. 27–32 (2016).
42. Ashwaq Al-Musharraf, Mona Alkhattabi, *An Educational Data Mining Approach to Explore The Effect of Using Interactive Supporting Features in an LMS for Overall Performance Within an Online Learning Environment*, *International Journal of Computer Science and Network Security*, 16(3) (2016).
43. M. G. M. Mohan, S. K. Augustin, V. S. K. Roshni, *A BigData approach for classification and prediction of student result using MapReduce*, 2015 IEEE Recent Advances in Intelligent Computational Systems (RAICS), pp. 145–150 (2015).
44. R. Suchithra, V. Vaidhehi, Nithya Easwaran Iyer, *Survey of Learning Analytics based on Purpose and Techniques for Improving Student Performance*, *International Journal of Computer Applications*, 111(1), pp. 22–26 (2015).
45. Yuri Vanessa Nieto Acevedo, Carlos Enrique Montenegro Marín, *Towards a Decision Support System based on Learning Analytics*, *Advances in Information Sciences and Service Sciences*, 7(1), pp. 1–12 (2015).
46. Yuri Vanessa Nieto Acevedo, Carlos Enrique Montenegro Marín, *System Architecture Based on Learning Analytics to Educational Decision Makers Toolkit*, *Advances in Computer Science and Engineering*, 13(2), pp. 89–105 (2014).
- [C2] Nikos Platis, Theoharis Theoharis, *Simplification of Vector Fields over Tetrahedral Meshes*, *Proceedings of Computer Graphics International 2004*, Crete, pp. 174–181 (2004).
47. Joshua A. Levine, *Delaunay Methods for Approximating Geometric Domains*, PhD Thesis, The Ohio State University (2009).
48. Tamal K. Dey, Joshua A. Levine, Rephael Wenger, *A Delaunay Simplification Algorithm for Vector Fields*, *Proceedings of 15th Pacific Graphics Conference* (2007).
49. Fabien Vivodtzev, *Hiérarchisation et visualisation multirésolution de résultats issus de codes de simulation*, PhD Thesis, Université Grenoble I - Joseph Fourier (2005).
- [C1] Antonis Ramfos, Ralph Busse, Nikos Platis, Peter Fankhauser, *CORBA-Based Data Integration Framework*, *Proceedings of the Third International Conference on Integrated Design and Process Technology (IDPT) – Vol. 2, International Workshop on Issues and Applications of Database Technology (IADT '98)*, Berlin, Germany (1998).
50. Dalen Kambur, Mark Roantree, John Murphy, *Using an Object Reference Approach to Distributed Updates*, in *Database and Expert Systems Applications (Lecture Notes in Computer Science, vol. 4653)*, pp. 182–191 (2007).

## 13. Teaching Details

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### 13.1 Postgraduate Courses

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#### **Data Visualization and Communication** (6 semesters, 2016 – 2019)

*MSc in Data Science, Athens University of Economics and Business*

Visual perception — Basic principles for creating good visualizations — Visualization types depending on the data type and dimension — Interactive visualizations — Communicating data through visualizations — Practice using Tableau and R.

Taught in collaboration with Professor D. Karlis.

#### **Field Prospection and Computing Technologies for Cultural Heritage** (3 semesters, 2015 – 2018)

*MSc in Cultural Heritage Materials and Technologies, University of the Peloponnese*

Co-ordinator of this course (all courses in this MSc programme are taught by several lecturers, each presenting topics of his/her specialization in a number of lectures).

Contents of my lectures: Principles of Visualization — Data Visualization techniques and tools, with applications for the environment and Cultural Heritage — Information Visualization techniques and tools, with applications for Cultural Heritage — Reconstruction of archaeological objects and sites — Virtual Reality applications.

#### **Topics in Information Visualization** (4 semesters, 2010 – 2017)

*Department of Informatics and Telecommunications, University of the Peloponnese*

Review of selected topics in Information Visualization — Study and presentation by the students of research papers within these topics.

#### **Research Topics in Computer Graphics** (2 semesters, 2012 – 2014)

*Department of Informatics and Telecommunications, University of the Peloponnese*

Review of selected topics in Computer Graphics — Study and presentation by the students of research papers within these topics.

#### **Programming Techniques** (1 semester, 2010 – 2011)

*Department of Computer Science and Technology (Postgraduate Programme), University of the Peloponnese*

Overview of basic programming structures — Introduction to object-oriented programming with C++ — Classes, objects — Inheritance — Polymorphism, overriding — The C++ Standard Library — Event-driven programming — The Qt library.

Taught in collaboration with Assistant Prof. G. Lepouras.

#### **Algorithm design and implementation** (1 semester, 2010 – 2011)

*Department of Computer Science and Technology (Postgraduate Programme), University of the Peloponnese*

Graph algorithms — Divide-and-conquer algorithms — Greedy algorithms — Elements of computational complexity — Implementations in C++.

Taught in collaboration with Assistant Prof. Th. Malamatos.

#### **Graphics and Visualization** (1 semester, 2009 – 2010)

*Department of Computer Science and Technology (Postgraduate Programme), University of the Peloponnese*

Topics of the Graphics part: Overview of basic Graphics topics — Lighting models and algorithms — Ray tracing — Shadow generation — Animation techniques — Surface simplification.

Topics of the Visualization part: Principles of Visualization — Scalar data visualization: isosurfaces, Marching Cubes, direct volume visualization (ray casting, splatting) — Vector data visualization: hedgehog plots, particle advection techniques (streamlines, pathlines, streaklines). Organisation and teaching of the “Graphics” and “Visualization” parts of this course.

Taught in collaboration with Dr Amalia Foka.

### **Graphics, Visualization, Fractals** (2 semesters, 2004 – 2006)

*Department of Informatics and Telecommunications (Postgraduate Programme), University of Athens*

Organisation and teaching of the “Graphics” and “Visualization” parts of this course.

Topics of the Graphics part: Lighting models and algorithms — Ray tracing — Shadow generation — Animation techniques — Surface simplification.

Topics of the Visualization part: Principles of Visualization — Scalar data visualization: isosurfaces, Marching Cubes, direct volume visualization (ray casting, splatting) — Vector data visualization: hedgehog plots, particle advection techniques (streamlines, pathlines, streaklines).

## **13.2 Undergraduate Courses**

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### **Object-Oriented Programming** (11 semesters, 2007 – 2019)

*Department of Informatics and Telecommunications (3<sup>rd</sup> semester), University of the Peloponnese*

Introduction to object-oriented programming and Java — Classes, objects, fields, methods — Access specifiers: public/private/protected, package access — Inheritance, polymorphism, abstract methods and classes, interfaces — Generics, Java collections — File manipulation — Elements of the Java Class Library.

### **Advanced Programming Topics** (9 semesters, 2009 – 2019)

*Department of Informatics and Telecommunications (4<sup>th</sup> / 6<sup>th</sup> semester), University of the Peloponnese*

GUI applications (using SWING) — Advanced use of the Java Class Library (data structures, iterators, anonymous classes, comparators, hashign) — Elements of network programming with Java — Code optimization.

### **Computer Graphics** (12 semesters, 2005 – 2019)

*Department of Informatics and Telecommunications (3<sup>rd</sup> / 4<sup>th</sup> / 5<sup>th</sup> / 6<sup>th</sup> / 7<sup>th</sup> semester), University of the Peloponnese*

Basic notions — Rasterization of basic shapes — Clipping algorithms — Transformation matrices in two and three dimensions — Projections — Parametric curves (Bézier curves) — The Z-buffer algorithm — Local lighting models and algorithms — Basic texture mapping — Basic shadow generation algorithms — OpenGL lab.

### **Data and Information Visualization** (2 semesters, 2006 – 2008)

*Department of Computer Science and Technology (6<sup>th</sup> semester), University of the Peloponnese*

Introduction to Visualization — Similarities and differences between data and information visualization — Principles of Visualization — Multidimensional data visualization — 3D Computer Graphics techniques for data visualization — Techniques based on focus, projection, warp — Trees, hierarchies, graphs — Evaluation of visualization methods.

### **Programming Principles** (1 semester, 2007 – 2008)

*Department of Computer Science and Technology (2<sup>nd</sup> semester), University of the Peloponnese*

Advanced programming in C — Multidimensional arrays — Advanced string manipulation — Pointers, arrays as pointers — Structures, pointers to structures — Files — Dynamic memory management, simple data structures — Searching and sorting algorithms — Pointers to functions — Event-driven programming — Advanced use of the preprocessor.

### **Multimedia Technology** (2 semesters, 2006 – 2008)

*Department of Computer Science and Technology (7<sup>th</sup> semester), University of the Peloponnese*

General characteristics of multimedia — Principles of data compression — Digital image: principles, file formats, the JPEG algorithm — Digital sound: principles, file formats, MP3 compression, MIDI — Digital video: principles, file formats, MPEG compression — Animation techniques — Optical storage media (CD, DVD) — Multimedia applications on the Internet, Streaming technologies — Development methodologies for multimedia applications.

**Multimedia and Virtual Reality** (1 semester, 2005 – 2006)

*Department of Computer Science and Technology (6<sup>th</sup> semester), University of the Peloponnese*

Teaching of the “Multimedia” part of this course.

The content of this module is similar to the one of the newer course “Multimedia Technology” in abridged form.

**Introduction to Computer Science and Technology** (1 semester, 2005 – 2006)

*Department of Computer Science and Technology (1<sup>st</sup> semester), University of the Peloponnese*

Introductory course aiming to present to the students several aspects of Computer Science.

Computer architecture (software, hardware) — Number systems — Digital data representation (text, image, sound) — Basic compression techniques — Error detection and correction — Machine language — Principles of operating systems — Basic algorithmic structures — Algorithm design — Data structures — Computational complexity — Program translation — Fundamentals of computer networks — Fundamentals of database systems — HTML lab.

**Information Technology and Management** (1 acad. year, 2005 – 2006)

*Faculty of Higher Education for Police Officers (4<sup>th</sup> year)*

Computer security — Data encryption — Internet applications — Statistical processing of data — Practice in the use of Word, Excel and Internet applications.

**Programming Techniques** (2 acad. semesters, 2000 – 2001)

*School of Programmers of the Greek Army*

Organisation and teaching of this introductory programming course for officers of the Greek Army; preparation of complete course notes (see publication [B3]).

### **13.3 Teaching Assistance**

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**Computer Graphics I** (5 semesters, 1997 – 2002)

*Department of Informatics and Telecommunications (5<sup>th</sup> semester), University of Athens*

Tutorial exercises (transformations, projections, clipping, Bézier curves) — OpenGL lab (introduction to the OpenGL model and GLUT, basic shapes, projections, transformations, hierarchical transformations for animated scenes, back-face culling, Z-buffer) — Coursework assignment and marking — Contribution to examination preparation and marking.

**Introduction to Programming** (1 semester, 1998 – 1999)

*Department of Informatics and Telecommunications (1<sup>st</sup> semester), University of Athens*

Tutorial exercises on the Pascal language — Coursework assignment and marking — Contribution to examination preparation and marking.

**Computer Science I** (1 semester, 1997 – 1998)

*Department of Mathematics (1<sup>st</sup> semester), University of Athens*

Preparation of full set of slides for teaching the Pascal language — Tutorial exercises — Coursework assignment and marking.

**Computer Lab** (1 acad. year, 1994 – 1995)

*Department of Mathematics, University of Athens*

Setup and administration of the lab computers — Teaching of introductory courses on MS-DOS, Windows and Word to first-year students — Coursework marking for modules offered by the Department of Mathematics (Computer Science I / II, Data Structures, Numerical Analysis).



### ***13.4 Secondary Education Teaching***

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#### **Computer Science (Standard Level / High Level)**

(1 acad. year, 2006 – 2007)

*International Baccalaureate Diploma Programme, Ziridis School*

The International Baccalaureate Diploma Programme is a two-year programme for entrance to international universities. It is designed and supervised by the International Baccalaureate Organization and offered in over 1500 schools worldwide.

The Computer Science course is offered in two levels (Standard and High Level). The Standard Level course covers basic elements of Computer Science (Computer Architecture — Number systems — Digital data representation — Operating Systems — Computer Networks — Compilers — Software Engineering) and programming in Java. The High Level course additionally includes further details on all the above subjects, covers further areas of Computer Science (File and Database Organization — Computational Complexity) and of programming (Object Oriented programming — Data Structures). Within the course, students develop a complete Java application and fully document the development process.