Dr. Nikos Karanikolas

Postdoctoral Researcher in Computer Science & Engineering

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Research Interests

Computational Social Choice, Information Visualization, Argumentation, Design and Analysis of Algorithms, Computational Complexity, Approximation Algorithms, Algorithmic Aspects of Communication Networks, Routing Algorithms, Cryptography.

Education

PhD in Computer Science and Engineering   *January 2009 – June 2014*
Department of Computer Engineering and Informatics, University of Patras, Patras, Greece

- Thesis: *Computational Aspects in Social Choice Theory* (in Greek)
- Advisor: Professor Christos Kaklamanis

M.Sc. in Computer Science and Engineering   *December 2008*
Department of Computer Engineering and Informatics, University of Patras, Patras, Greece

- Thesis: *Computational Aspects in Social Choice: A Study of Dodgson Elections*
- Advisor: Professor Christos Kaklamanis

Diploma in Computer Engineering and Informatics   *June 2006*
Department of Computer Engineering and Informatics, University of Patras, Patras, Greece

Academic Appointments

Postdoctoral Researcher   *June 2025 – Present*
Department of Computer Engineering and Informatics, University of Patras, Greece

- Subject: *Algorithmic Theory and Artificial Intelligence*
- Supervisor: Professor Christos Kaklamanis

Postdoctoral Researcher   *December 2019 – September 2021*
Department of Computer Engineering and Informatics, University of Patras, Greece

- Subject: *Decision making in multi-agent systems through Argumentation Framework and Social Choice Theory*
- Supervisor: Professor Christos Kaklamanis

Postdoctoral Researcher   *November 2017 – April 2019*
Department of Computer Engineering and Informatics, University of Patras, Greece

- Subject: *Applications of computational methods in aspects of Social Choice Theory*

- Supervisor: Professor Christos Kaklamanis

Postdoctoral Researcher *November 2016 – October 2017*
GraphIK, LIRMM (University of Montpellier) and INRA

- Subject: *Argumentation and Computational Social Choice in Agricultural Applications*
- Supervisors: Research Engineer (HDR – qualified Senior Researcher) Patrice Buche; Associate Professor Madalina Croitoru; Research Scientist Rallou Thomopoulos; Research Scientist Pierre Bisquert

Postdoctoral Researcher *October 2014 – October 2015*
Équipe Ingénierie de l'Interaction Homme-Machine, Laboratoire d'Informatique de Grenoble, Institut polytechnique de Grenoble

- Subject: *Interactive Visualization of Voting Procedures*
- Supervisors: Assistant Professor Renaud Blanch; Assistant Professor Sylvain Bouveret

Teaching Experience

Adjunct Lecturer *2019 – 2023 and 2025 – Present*
Department of Computer Engineering and Informatics, University of Patras, Greece

- Communication Algorithms
- Cryptography

Teaching Assistant *2007 – 2014*
Department of Computer Engineering and Informatics, University of Patras, Greece

- Communication Algorithms
- Cryptography
- Theory of Computation
- Parallel Algorithms

Professional Experience

Deputy Head of Department of Software Development and Design *January 2025 – Present*
Hellenic Auxiliary Pensions Defined Contributions Fund

Department of Software and Operational Applications *April 2021 – December 2024*
Ministry of Migration and Asylum, Greece

Researcher *November 2016 – March 2017*
EU-funded research project NoAW (No Agro-Waste), INRA, Montpellier, France

- Research work in the project

Researcher *April 2010 – June 2014*
Integrated Project ICT-2010-258307 EULER, Experimental UpdateLess Evolutive Routing, *University of Patras, Greece*

- Research work in the project

- Coordination, tracking, and reporting of the project

Computer Engineer *January 2010 – December 2010*
Integrated Systems conducting Electronic Lotteries, Research Academic Computer Technology Institute, Patras, Greece

- Monitoring, maintenance, and upgrade of the random number generator for the lottery game *Kino* (Hypergen and Cryptogen systems)

Computer Engineer / Researcher *January 2007 – February 2010; January 2014 – September 2014*
Integrated Project IP-FP6-015964 AEOLUS, Algorithmic Principles for Building Efficient Overlay Computers*, University of Patras, Greece*

- Design and development of a peer-to-peer task scheduling application (OCP) using Java and the JXTA protocol

- Research work in the project

- Coordination, tracking, and reporting of the project

Trainer *Date not specified*
Educational Training Programme for Informatics Teachers in Secondary Education (PE19-20-Subproject/1), Greek Ministry of Education

- Preparation of teaching material

- Lesson planning

- Analysis of teaching methods for the course of Software Development

Journal Publications

1. N. Karanikolas, C. Kaklamanis, and S. Nikolopoulos. *AQUA: A blockchain based multi-winner e-voting system.* Technium, 11:32–43, 2023.

2. I. Caragiannis, C. Kaklamanis, N. Karanikolas, G. A. Krimpas. *Evaluating Approval-Based Multi-winner Voting in Terms of Robustness to Noise.* Journal of Autonomous Agents and Multi-Agent Systems (JAAMAS), 36(1), 2022.

3. P. Bisquert, M. Croitoru, C. Kaklamanis, and N. Karanikolas. *A Decision-Making approach where Argumentation added value tackles Social Choice deficiencies.* Progress in Artificial Intelligence, 8(2):229–239, 2019.

4. N. Karanikolas, P. Bisquert, P. Buche, C. Kaklamanis, and R. Thomopoulos. *A Decision Support Tool for Agricultural Applications Based on Computational Social Choice and Argumentation.* International Journal of Agricultural and Environmental Information Systems (IJAEIS), 9(3):54–73, 2018.

5. I. Caragiannis, C. Kaklamanis, N. Karanikolas, and A. D. Procaccia. *Socially desirable approximations for Dodgson's voting rule.* ACM Transactions on Algorithms, 10(2), 2014.

6. I. Caragiannis, J. A. Covey, M. Feldman, C. M. Homan, C. Kaklamanis, N. Karanikolas, A. D. Procaccia, and J. S. Rosenschein. *On the approximability of Dodgson and Young elections.* Artificial Intelligence, 187–188:31–51, 2012.

Conference Publications

1. K. Papaioannou, N. Karanikolas, E. Papaioannou. *The "Camino de Santiago" and the digital era: seeking a balance between spirituality and innovation.* In Proceedings of the 20th annual International Technology, Education and Development Conference (INTED 26), IATED, 2026, to appear.

2. P. Ploiarchopoulou, E. Papaioannou, N. Karanikolas, C. Kaklamanis. *An online application for CFG-to-NPDA conversion and visualization.* In Proceedings of the 18th annual International Conference of Education, Research and Innovation (ICERI 25), IATED, pp. 816–826, 2025.

3. R. Sinas, E. Papaioannou, N. Karanikolas, C. Kaklamanis. *A web application for the animated visualization of the Shearsort parallel sorting algorithm.* In Proceedings of the 18th annual International Conference of Education, Research and Innovation (ICERI 25), IATED, pp. 827–836, 2025.

4. S. I. Polydoropoulos, E. Papaioannou, N. Karanikolas, C. Kaklamanis. *A serious game for Euler circuits and paths.* In Proceedings of the 18th annual International Conference of Education, Research and Innovation (ICERI 25), IATED, pp. 1203–1212, 2025.

5. D. Sarioglou, E. Papaioannou, N. Karanikolas, C. Kaklamanis. *"RSA… Made Simple": An Online Educational and Training Application.* In Proceedings of the 17th annual International Conference on Education and New Learning Technologies (EDULEARN 25), IATED, pp. 391–400, 2025.

6. I. Sarris, E. Papaioannou, N. Karanikolas, C. Kaklamanis. *"Find The Way": A Serious Game for the Minimum Spanning Tree Problem.* In Proceedings of the 17th annual International Conference on Education and New Learning Technologies (EDULEARN 25), IATED, pp. 2097–2106, 2025.

7. K. Troumpounis, E. Papaioannou, N. Karanikolas, C. Kaklamanis. *A Web Application for MST Computation in Random and User-defined Graphs.* In Proceedings of the 17th annual International Conference on Education and New Learning Technologies (EDULEARN 25), IATED, pp. 8042–8052, 2025.

8. K. Papaioannou, N. Karanikolas, E. Papaioannou. *The contribution of machine translation to the preservation of regional languages in Spain.* In Proceedings of the 19th annual International Technology, Education and Development Conference (INTED 25), IATED, pp. 3794–3803, 2025.

9. K. Papaioannou, N. Karanikolas, E. Papaioannou. *The impact of technology on the literature publishing industry in Spain.* In Proceedings of the 19th annual International Technology, Education and Development Conference (INTED 25), IATED, pp. 3826–3831, 2025.

10. E. Rouchota, E. Papaioannou, N. Karanikolas, K. Papaioannou, G. Moisiadis, C. Kaklamanis. *"CT-PEL": an online platform for gaining insight into regional cultural tourism.* In Proceedings of the 16th annual International Conference of Education, Research and Innovation (ICERI 23), IATED, pp. 1665–1674, 2023.

11. P. Antoniou, E. Papaioannou, N. Karanikolas, G. Moisiadis, C. Kaklamanis. *"PCT": an online crowdsourcing-based application for promoting cultural tourism by exploiting Social Choice Theory and InfoVis.* In Proceedings of the 16th annual International Conference of Education, Research and Innovation (ICERI 23), IATED, pp. 143–153, 2023.

12. H. Salaga, N. Karanikolas, and C. Kaklamanis. *"SHeMeD": An Application on Secure Computation of Medical Cloud Data Based on Homomorphic Encryption.* In Proceedings of the International Conference on Computational Science and its Applications (ICCSA 2023), Part VI, pp. 116–133.

13. A. Stefanopoulos, E. Papaioannou, N. Karanikolas, G. Moisiadis, C. Kaklamanis. *"Check It Yourself": an online crowdsourcing-based application for checking news validity exploiting Social Choice Theory and InfoVis.* In Proceedings of the 15th annual International Conference on Education and New Learning Technologies (EDULEARN 23), IATED, pp. 559–568, 2023.

14. I. Caragiannis, C. Kaklamanis, N. Karanikolas, G. A. Krimpas. *Evaluating Approval-Based Multiwinner Voting in Terms of Robustness to Noise.* In Proceedings of the Twenty-Ninth International Joint

Conference on Artificial Intelligence (IJCAI'20), Article 11, pp. 74–80, 2021.

15. N. Karanikolas, P. Bisquert, and C. Kaklamanis. *A Voting Argumentation Framework: Considering the Reasoning behind Preferences.* In Proceedings of the 11th International Conference on Agents and Artificial Intelligence (ICAART 19), Volume 1, pp. 42–53, 2019. (Best Paper Award Runner-up)

16. N. Karanikolas, M. Croitoru, P. Bisquert, C. Kaklamanis, R. Thomopoulos, and B. Yun. *Multi-Criteria Decision Making with Existential Rules using Repair Techniques.* In Proceedings of the AI-2018, Thirty-eighth SGAI International Conference on Artificial Intelligence, pp. 177–183, 2018.

17. P. Bisquert, M. Croitoru, N. Karanikolas. *A Qualitative Decision-Making Approach Overlapping Argumentation and Social Choice.* In Proceedings of ADT 2017, the 5th International Conference on Algorithmic Decision Theory, pp. 344–349, 2017.

18. P. Bisquert, P. Buche, M. Croitoru, N. Karanikolas, and R. Thomopoulos. *Selection of agro-waste valorisation routes based on a computational social choice and argumentation decision support tool* (Extended Abstract). In EFITA WCCA Congress, 2017.

19. N. Karanikolas, R. Blanch, and S. Bouveret. *Edge-Compressed Majority Graph: Where Social Choice Meets Information Visualization.* In Proceedings of the Sixth International Workshop on Computational Social Choice (COMSOC 16), 2016.

20. I. Caragiannis, C. Kaklamanis, N. Karanikolas, and A. D. Procaccia. *Socially desirable approximations for Dodgson voting rule.* In Proceedings of the 11th ACM Conference on Electronic Commerce (EC 10), pp. 253–262, 2010.

21. I. Caragiannis, J. A. Covey, M. Feldman, C. M. Homan, C. Kaklamanis, N. Karanikolas, A. D. Procaccia, and J. S. Rosenschein. *On the approximability of Dodgson and Young elections.* In Proceedings of the 20th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 09), pp. 1058–1067, 2009.

Other Publications

1. N. Karanikolas, M. Kyropoulou, and T. B. Sørensen. *Editor's puzzle: Borrowing as cheaply as possible.* SIGecom Exchanges, 10(2).

Academic Service

Program Committee

- 25th International Joint Conference on Artificial Intelligence (IJCAI 2016)
- 27th International Joint Conference on Artificial Intelligence and 23rd European Conference on Artificial Intelligence (IJCAI-ECAI 2018) – Distinguished Member
- 28th International Joint Conference on Artificial Intelligence (IJCAI 2019)

Journal and Conference Reviewing

- Journals: *Theoretical Computer Science*, *ACM Journal on Experimental Algorithmics*
- Conferences: SAGT 2009, ESA 2009, WAOA 2010, WAOA 2011, WAOA 2012, HiPC 2010, FUN 2012, AAAI 2017, LATIN 2022, CIAC 2023, IPDPS 2023, ICAART 2024, WINE 2024, CSCML 2024, ICAART 2025, ICDCS 2025

Skills

Research and Teaching

- Design and Analysis of Algorithms

- Teaching
- Academic writing, proofreading, and LaTeX

Project Engineering

- Project planning and implementation
- Project coordination

Programming Languages

- Java (advanced) – JXTA protocol, Graphics2D API
- C (novice)
- C++ (novice)
- Python (novice)

Business Intelligence & Analytics

- Power BI (data modeling, DAX, Power Query, advanced visualizations, dashboards, KPIs, performance optimization)

Databases & Data Engineering

- SQL: advanced querying, joins, window functions, CTEs, stored procedures, and optimization
- Database design and normalization, ETL, and data quality validation

Operating Systems

- Windows family, Unix, macOS, Android, MS-DOS

Scholarships

- PhD scholarship funded by the Research Funding Program: Heracleitus II, 2010–2014
- Postdoctoral scholarship funded by the Greek State Scholarships Foundation (IKY), 2017–2019

Training Seminars / Schools

- AEOLUS School on Algorithmic Game Theory (Patras, Greece, 18–19 December 2006), collocated with the 2nd International Workshop on Internet & Network Economics (WINE 2006)
- COST-ADT Doctoral School on Computational Social Choice (Estoril, Portugal, 9–14 April 2010)
- Summer School on Algorithmic Game Theory (Samos, Greece, 14–21 July 2012)
- Summer School on Matching Problems, Markets, and Mechanisms (Budapest, Hungary, 24–28 June 2013)
- Summer School on Fair Division (Grenoble, France, 13–17 July 2015)
- Workshop on Decision Making (Toulouse, France, 24–26 April 2017)
- Theoretical Aspects of e-Democracy (Toulouse, France, 27 April 2017)

Languages

- English: Certificate of Proficiency, University of Michigan
- French: Beginner–Intermediate (Level B1)

Interests

- Radio producer at the Radio Station of the University of Patras and ERT Radio

- Sports: basketball, football, ski

- Travel

- Cinema (film-making and video editing)