Merkouris Papamichail Computer Scientist

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Heraklion, Greece

Scientific interests

Algorithms, Computability Theory, Discrete Mathematics, Computational Logic

Education

2022 – Present	**UOC** – Heraklion, Greece
	PhD in Computer Science.
2020 – 2022	**NKUA, NTUA** – Athens, Greece
	MSc in Algorithms, Logic and Discrete Mathematics, *GPA: 9.13*.
2014 – 2020	**NKUA** – Athens, Greece
	BSc in Computer Science, *GPA: 7.67*

Selected Courses

- *Theory of Algorithms & Complexity*: Algorithmic Operational Research, Advanced Algorithms, Combinatorial Optimazation, Algorithmic Graph Theory, Algorithmic Game Theory, Approximate Algorithms, Parametrized Complexity.

- *Computability theory*: Theory of Computation, Computational Complexity, Theory of Recursion, Mathematical Logic.

- *Discrete Mathematics*: Graph Theory, Mathematics for Computer Science, Theory of Linear Programming.

- *Theory of Programming Languages*: Principles of Programming Languages, Logic Programming, Types and Programming Languages.

- *Algorithms & Applications:* Computational Geometry, Machine Learning, Algorithms in Structural Bioinformatics, Knowledge Representation and Reasoning.

MSc Thesis

2021 – 2022	**Sorting & Selection Problems in Partially Ordered Sets**
	Advisor: prof. Stavros Kolliopoulos.
	permalink: https://pergamos.lib.uoa.gr/uoa/dl/object/3232651
	"Pergamos" repository.
	The presentation of the Master's Thesis is available here.

BSc Thesis

2020	**Introduction to Matroid Theory**
	Advisor: prof. Stavros Kolliopoulos.
	permalink: https://pergamos.lib.uoa.gr/uoa/dl/object/2925849
	"Pergamos" repository.

Publications

2022   **Implementating the Adaptation Procedure in Misinformation Games**
M.Papamichail, C. Varsos, G. Flouris - SETN 2022
The paper was a result of my work as intern in the Institute of Computer Science,
FORTH (see bellow). https://dl.acm.org/doi/10.1145/3549737.3549781.

Internship

2021 – 2022   **Graduate Research Assistant**
Institute of Computer Science, FORTH
Heraklion, Greece
The Implementation was written mainly in Python. We also utilized the Answer Set
Programming Language Clingo, and the software package for computation of Nash
equilibria Gambit. We also implemented a parallel algorithm, achieving the optimal
parallelization; thus improving on our first algorithm. The source code of the project
is available here.

Teaching Assistanship

Spring 2022   **Algorithms and Complexity**
Computer Science Department, University of Crete
As teaching assistant, I undertake some of the tutoring lectures of the undergraduate
course on Algorithms & Complexity. The slides of the presentations are available
here, in Greek.

Membership

2022 – 2023   **Hellenic Society of Artificial Intelligence**
In 2022 I was accepted as a member of the Hellenic Society of Artificial Intelligence.

Programming Languages

Imperative Programming: C++, Python.

Scientific Computations: Octave, Matlab.

Declarative Programming: Clingo, Prolog, Haskell, Ocaml.

Operating Systems: Linux.

Markdown Languages: LaTeX.

Selected Presentations and Reports

Fall 2022   **Four-Color Theorem: A problem that remained open for over a century**

For the master's course on Technical Writing in English. A simplified presentation of the classical computer science result, the For-Color Theorem due to K. Appel and W. Hanken. The presentation is available here.

Spring 2021   **Parametrized Two-Player Nash Equilibrium**

For master's course on Parametrized Algorithms and Complexity. Presentation of Danny Hemerlin et al. paper *"Parametrized Two-Player Nash Equilibrium"*, 2011. The presentation and report are available here.

Spring 2021   **On the Parametrized Complexity of Red-Blue Points Separation**

For master's course on Parametrized Algorithms and Complexity. Presentation of Édouard Bonnet et al. paper *"On the Parametrized Complexity of Red-Blue Points Separation*, 2017. The presentation and report are available here.

Fall 2021   **Non-monotone Submodular Maximization under Matroid and Knapsack Constraints**

For the master's course on Approximate Algorithms. Presentation of Jon Lee's, et al. paper *"Non-monotone Submodular Maximization unde Matroid and Knapsack Constraints"*, 2009. The presentation and report are available here.

Spring 2020   **On the Maximal Number of Disjoint Circuits of a Graph**

For the master's course on Algorithmic Grapth Theory. Presentation of P. Erdös and L. Pösa paper *"On the Maximal Number of Disjoint Circuits of a Graph"*, 1961. The presentation and report are available here (in Greek).

Fall 2020   **Approximation Algorithms for Orienteering and Discounted-reward TSP**

For the master's course on Combinatorial optimazation. Presentation of the paper of Avrium Blum's et al. on *"Approximation Algorithms for Orienteering and Discounted-reward TSP"*, 2003. Comparison with the paper of Samir Khuller et al. on *"Analyzing the Optimal Neighbohood: Algorithms for Partial and Budget Connected Dominating Set Problems"*, 2019. The presentation and report are available here (in Greek).

Fall 2020   **Amortized Analysis**

For the master's advanced course on Algorithms & Complexity. A presentation of the elementary notions of Amortized Analysis. The presentation is available here (in Greek).

Spring 2018   **Maximum Flow – Minimum Cut**

For the bachelor's course on Advance Topics in Algorithms. A presentation of the classical Max Flow – Min Cut problem and the related algorithm. The presentation is available here.

Fall 2018   **Colourful Caratheodory Theorem**

For the bachelor's course on Computational Geometry. Presentation of the papers *"Computational Aspects of the Colorful Caratheodory Theorem"*, by Wolfrang Mulzer, et al., 2015, and the paper *"Colorful Linear Programming and its Relatives"*, by Impre Barany et al., 1997. The presentation and report are available here (in Greek).

Selected Programming Projects

Fall 2022   **Lambda Calculus Type Checker & Interpreter in OCaml**

For the postgraduate course on Types and Programming Languages, of Computer Science Department, University of Crete. The source code is available here.

Fall 2021   **Algorithms' implementations in C++**

For the master's advanced course on Algorithms & Complexity. The project's code and documentation is available here.

Spring 2020   **NMR-structure prediction in Matlab/Octave**

For the master's course on Algorithms in Structural Bioinformatics. A protein structure prediction based on previous work by I. Emiris and G. Nikitopoulos on *"Molecular Conformation Search by Distance Matrix Pertubation"*, 2003. Our contribution was based on closed scource code, so it is available for the reviewer, after contacting the author of this resume. The report of the above project is available here.

Fall 2019   **Constraint problems in ECLiPSe Prolog**

For the bachelor's course on Logic Programming. The project's code and documentation is available here.

Spring 2018   **Bank simulation in C++**

For the bachelor's course on System Programming. A bank simulation that handles bitcoin transactions. A project about data structures implementation in C++. The project's code and documentation is available here.

Spring 2018   **P2P interprocess comunication in C++**

For the bachelor's course on System Programming. A project about inter-process communication in Linux OS. The project's code and documentation is available here.

Spring 2018   **Dropbox-like application in C++**

For the bachelor's course on System Programming. A project about multi-threading and network sockets in Linux OS. The project's code and documentation is available here.

Fall 2018   **Bitcoin recommendation system in C++**

For the bachelor's course on Software Development for Algorithmic Problems. Bitcoin recommendation system, on real-life twitter data. A project about Clustering, Sentiment Analysis and Local Sensitive Hashing. The project's code and documentation is available here.

Spring 2017   **Classifiers in Matlab/Octave**

For the bachelor's course on Machine Learning. Implementation of k-Near Neighbours, Euclidean and Naive Bayesian Classifiers. The project's code and documentation is available here.

Fall 2017   **Game solver in Haskell**

For the bachelor's course on Principles of Programming Languages. A solver for the game "Rush hour". The project's code and documentation is available here.