Athina Georgara

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Surname: Georgara (Γεωργαρά)
Given name: Athina (Αθηνά)
Nationality: Greek
Languages: Greek (native), English

Athina Georgara completed her undergraduate studies and acquired a diploma degree at the school of Electrical and Computer Engineering in Technical University of Crete (September, 2017). She acquired an M. Sc. in Electronic and Computer Engineering in Technical University of Crete (August 2019) under the supervision of associate professor Georgios Chalkiadakis. Currently, Athina is a PhD candidate in Autonoma University of Barcelona, in the Artificial Intelligence Research Institute under the supervision of professors Carles Sierra and Juan A. Rodríguez-Aguilar. Her PhD studies are funded by the consulting company *Enzyme Advising Group*, where she was employed during her studies until March 2023. Thereafter, Athina was employed by Artificial Intelligence Research Institute, CSIC, to participate in the VALAWAR European Project. Her interests in research lie in Team Formation in Multiagent Systems, Trustworthy and Explanable Intelligence Systems, and Algorithmic Game Theory. During the academic years (2017-2018) and (2018-2019), Athina was a teaching assistant for the courses of multi-agent systems and artificial intelligence in the school of EECE at TUC. Moreover, Athina voluntarily participated as organizer assistant in the 1^{st} international summer school of *Artificial Intelligence & Games*, and the 19^{th} Advanced Course on AI: *Artificial Intelligence for Multi-Agent Worlds* summer school. Athina is also an active member of GOGS, a reading group designed for exploring several artificial intelligence, machine learning and game theory topics.

Education

IIIA-CSIC / Autonoma University of Barcelona **Barcelona, Spain**
Industrial PhD in collaboration with Enzyme Advising Group *Nov 2019–currently*
Title : *"Trustworthy Task Allocation for Human Teams"*

The Collider **Barcelona, Spain**
OnCampus Lean LaunchPad 2020 *Oct 2020–Dec 2020*
An *Entrepreneurship programme* of Mobile World Capital Barcelona in collaboration with Generalitat de Catalunya Department d'Empressa i Coneixement and Catalunya Emprèn.

Traversal Competencies (Catalan Industrial Doctorates 2022 edition) **Barcelona, Spain**
Knowledge Innovation Market (KIM) *Sep 2022–Dec 2022*

Technical University of Crete **Chania, Greece**
M.Sc. in Electronic and Computer Engineering, Grade 9.17 *Oct 2017–Aug 2019*
Title : *"Hedonic Games in the Real World: machine learning and theoretical extentions"*

Technical University of Crete **Chania, Greece**
Diploma in Electrical and Computer Engineering, Grade* 8.02 *Sept 2011–Sept 2017*
Title : *"A Serious Game Approach to Promote Cooperative Civic Actions at Local Level"*

**The Diploma in ELECTRICAL AND COMPUTER ENGINEERING of the SCHOOL OF ELECTRICAL AND COMPUTER ENGINEERING, Technical University of Crete, is an Integrated Master Degree, level 7 of the National and European Qualification Framework (Hellenic Ministry of Education Decree134328/Z1, FEK B' 3987, 14/09/2018).*

Industry

Enzyme Advising Group **Barcelona, Spain**
Consultant [Software Engineer] *Sept 2019–Mar 2023*
work on Artificial Intelligence Innovations

Publications

Full Papers

Learning Hedonic Games via Propabilistic Topic Modeling: A. Georgara, T. Ntiniakou, and G. Chalkiadakis. In Proc. of 16th European Conference on Multi-Agent Systems (EUMAS'18), December 2018, Bergen, Norway

Extracting Hidden Preferences Over Partitions in Hedonic Cooperative Games: A. Georgara, D. Troullinos, and G. Chalkiadakis. In Proc. of 12th International Conference on Knowledge Science, Engineering and Management (KSEM'19), August 2019, Athens, Greece. **Best Student Paper Award winner**

Hedonic Utility Games: A. Georgara, and G. Chalkiadakis. In Proc. of 11th Hellenic Conference On Artificial Intelligence (SETN'20), September 2020, Athens, Greece.

Building Contrastive Explanations for Multi-Agent Team Formation: In Proc. of 21st International Conference on Autonomous Agents and Multiagent Systems (AAMAS'22), May 2022, Auckland, NZ.

ε-MC nets: A Compact Representation Scheme for Large Cooperative Game Settings: E. Streviniotis, A. Georgara, and G. Chalkiadakis. In 15th International Conference on Knowledge Science, Engineering and Management (KSEM'22), August 2022, Virtual Event, Singapore.

Allocating teams to tasks: an anytime heuristic competence-based approach: A. Georgara, J.A. Rodriguez-Aguilar, and C. Sierra. In 19th European Conference on Multi-Agent Systems (EUMAS'22), September 2022, Düsseldorf, Germany.

Short Papers

Towards a competence-based approach to allocate teams to tasks: A. Georgara, J.A. Rodriguez-Aguilar, and C. Sierra. (Extended Abstract). In Proc. of 20th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'21), May 2021, Virtual Event, UK.

A succinct representation scheme for cooperative games under uncertainty: E. Streviniotis, A. Georgara, and G. Chalkiadakis. (Extended Abstract). In Proc. of 20th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'21), May 2021, Virtual Event, UK.

An Anytime Heuristic Algorithm for Allocating Many Teams to Many Tasks: A. Georgara, J.A. Rodriguez-Aguilar, C. Sierra, O. Minch, R. Kazhamiakin, A.P. Aprosio, and J.C. Pazzaglia. (Extended Abstract). In Proc. of 21st International Conference on Autonomous Agents and Multiagent Systems (AAMAS'22), May 2022, Auckland, NZ.

Privacy-Aware Explanable Team Formation: A. Georgara, J.A. Rodriguez-Aguilar, and C. Sierra. In the 24th International Conference on Principles and Practice of Multi-Agent Systems (PRIMA'22), November 2022, Valencia, Spain.

Workshop Papers

TAIP: an anytime algorithm for allocating student teams to internship programs: A. Georgara, C. Sierra, and J.A. Rodriguez-Aguilar. In 11th International Workshop on Optimization and Learning in Multiagent Systems (OptMas'20), May 2020, Auckland, New Zeland.

Edu2Com: an anytime algorithm to form student teams in companies: A. Georgara, C. Sierra, and J.A. Rodriguez-Aguilar. In Harvard CRCS Workshop on AI for Social Good (AI4SG), July 2020.

A Fair Dynamic Pricing Policy for the Hotel Industry: E. Streviniotis, A. Georgara, F. Bistaffa, and G. Chalkiadakis. In 5th Games, Agents and Incentives Workshop (GAIW'23), May 2023, London, UK.

Journals

The AI4Citizen pilot: Pipelining AI-based technologies to support school-work alternation programmes: A. Georgara, R. Kazhamiakin, O. Minch, A.P. Aprosio, J.C. Pazzaglia, J.A. Rodriguez-Aguilar, and C. Sierra. In Applied Intelligence Journal. (2023)

Projects Participation

AI4EU: A European AI On Demand Platform and Ecosystem **2019-2021**
The AI4Citizens Pilot (work-package T6.2)
Aims to develop a European AI ecosystem, bringing together the knowledge, algorithms, tools and resources available and making it a compelling solution for users.

TAILOR **2020-2022**
Foundations of Trustworthy AI - Integrating Reasoning, Learning and Optimization
Aims to build a strong academic-public-industrial research network with the capacity of providing the scientific basis for Trustworthy AI leveraging and combining learning, optimization and reasoning for realizing AI systems that incorporate the safeguards that make them in reliable, safe, transparent and respectful of human agency and expectations.

Yoma Operational Research **2022-2023**
Empowering African youth on their journey from learning-to-earning.
Aims to support African countries in developing learning-to-earning opportunities by involving local youth under the impetus of UNICEF.

VALAWAI **2023**
Value-Aware Artificial Intelligence
Works towards the development of a toolbox to build Value-Aware AI resting on two pillars: An architecture for consciousness inspired by the Global Neuronal Workspace model, and a foundational framework for moral decision-making.

Teaching Experience

[COMP-517] Multi-Agent Systems **2017-2018**
School of Electcial and Computer Engineering, Technical University of Crete *Chania, Greece*
Teaching assistant; course taught by Dr. G. Chalkiadakis

[COMP-517] Multi-Agent Systems **2018-2019**
School of Electcial and Computer Engineering, Technical University of Crete *Chania, Greece*
Teaching assistant; course taught by Dr. G. Chalkiadakis

[COMP-417] Artificial Intelligence **2018-2019**
School of Electcial and Computer Engineering, Technical University of Crete *Chania, Greece*
Teaching assistant; course taught by Dr. G. Chalkiadakis

Reviewing Experience

OptLearnMAS 21 **2021**
The 12th Workshop on Optimization and Learning in Multiagent Systems

CCIA 22 **2022**
The 24th International Conference of the Catalan Association for Artificial Intelligence

HHAI 22 **2022**
The 1st Hybrid Human Artificial Intelligence

Computers and Operations Research **2022-2023**
Journal

PAAMS 23 **2023**
21th International Conference on Practical Applications of Agents and Multi-Agent Systems

Public Presentations

A serious approach to promote cooperative civic actions at local level **2017**
Technical University of Crete, (Diploma thesis defence)
Chania, Greece

Hedonic games in the real world: machine learning and theoretical extentions **2019**
Technical University of Crete, (M.Sc. thesis defence)
Chania, Greece

Extracting Hidden Preferences Over Partition in Hednic Cooperative Games **2019**
12th International Conference on Knowledge Science, Engineering and Management (KSEM'19)
Athens, Greece

TAIP: an anytime algorithm for allocating student teams to internship programs **2020**
11th International Workshop on Optimization and Learning in Multiagent Systems (OptMas'20)
Online

Edu2Com: an anytime algorithm to form student teams in companies **2020**
In Harvard CRCS Workshop on AI for Social Good (AI4SG)
Online

Hedonic Utility Games **2020**
11th Hellenic Conference On Artificial Intelligence (SETN'20)
Online

ε-MC nets: A Compact Representation Scheme for Large Cooperative Game Settings **2022**
15th International Conference on Knowledge Science, Engineering and Management (KSEM'22)
Online

Building contrastive explanations for multi-agent team formation **2022**
21st International Conference on Autonomous Agents and Multiagent Systems (AAMAS'22),
Online

Building contrastive explanations for multi-agent team formation **2022**
IIIA Seminar
Barcelona, Spain

EduTeams: A tool based on Artificial Intelligence for team building in the classroom **2022**
VISION AI Open Day 2022
Brussels, Belgium

Allocating teams to tasks: an anytime heuristic competence-based approach **2022**
19th European Conference on Multi-Agent Systems (EUMAS'22)
Düsseldorf, Germany

Privacy-aware explanable team formation **2022**
24th International Conference on Principles and Practice of Multi-Agent Systems (PRIMA'22)
Valencia, Spain

Explanations in team formation scenarios **2022**
Toulouse Workshop on Explanation and Epistemic Reasoning
Toulouse, France

A fair dynamic pricing policy for the hotel industry **2023**
5th Games, Agents and Incentives Workshop (GAIW'23)
London, UK

Posters

Towards a competence-based approach to allocate teams to tasks **2021**
20th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'21)
Online

A succinct representation scheme for cooperative games under uncertainty **2021**
20th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'21)
Online

An anytime heuristic algorithm for allocating many teams to many tasks **2022**
21st International Conference on Autonomous Agents and Multiagent Systems (AAMAS'22)
Online

Languages

Greek
Native

Certificate Of **Proficiency in English**
University of Michigan *2009*

Interests of Research

- Team Formation in Multi-agent Systems
- Explainable AI, Explainability and Privacy
- Optimization, Combinatorial Optimization Problems
- Algorithmic and Cooperative Game Theory
- Machine Learning: Supervised, Unsupervised & Reinforcement Learning

Programming Languages & Framework

- **Fluent**: Python, Java, C, Matlab
- **Familiar**: C++, Javascript, SQL
- **Familiar OS**: Linux, Windows
- **Framework**: CPLEX-IBM, Git, PyCharm

Summer Schools Participation

AI & Games **Chania, Greece**
1^{st} *International Summer School of* Artificial Intelligence & Games *May 2018*
Organizer assistant

Icarus Drone School **Thes/niki, Greece**
Deep Learning & Computer Vision for Drone Imaging & Cinematography *August 2018*
Participant

Advanced Course on AI **Chania, Greece**
18^{th} *summer school on* Artificial Intelligence for Multi-Agent Worlds *July 2019*
Organizer assistant

Advanced School on Artificial Intelligence **Online**
22^{nd} *European Agent Systems Summer School* *July 2021*
Participant

Advanced Course on AI **Barcelona, Spain**
19^{th} *summer school on* Explainable AI *June 2022*
Participant

TAILOR **Barcelona, Spain**
2^{nd} *summer school on* Trustworthy AI *June 2022*
Participant

PhD thesis

Title: *Team Formation Methods for Dynamic Large-Scale Competence Based Problems*

Supervisors: Carles Sierra, Juan Antonio Rodríguez-Aguilar, and Luis Artiles Martinez

Abstract: In many practical applications, we notice a shift towards teamwork and collaboration. An individual alone may not have the complete skill set or the power to fulfil the requirements of a job on time. Instead, employing a group of people to join forces and carry out a given job may result in positive outcomes. However, forming *efficient* teams, i.e., putting together the right people that can efficiently work with each other, combine their skills, knowledge and expertise and fulfil the job assigned to them at the best possible quality, is a challenging task. A team's efficiency depends on various factors. First and foremost, it depends on the job or the task the team needs to carry out. It also depends on each team member's area and level of expertise, personality, personal preferences, motives and aspirations, interpersonal relations with the rest of the team, etc. This dissertation addresses the problem of forming *human teams*, and we contribute to the problem of allocating tasks for human teams by developing tools to aid the process.

First, we explore the several components that affect the behaviour and performance of individuals when they participate in a team. To do so, we thoroughly review the literature regarding teamwork and collaboration, considering research in the fields of Psychology and Social Sciences. Then, we formally model how to assess the impact of individuals' characteristics on a team's collective behaviour; and therefore determine the team's expected performance when they work on a specific job or task. Second, we

define the *non-overlapping many teams to many tasks allocation problem (NOMTMT-AP)*. This is the problem of forming non-overlapping teams so that each team is allocated to work on one task while each task is tackled by one team. Third, we develop a linear programming encoding for optimally solving the problem. However, as the number of agents and tasks grows, solving the problem optimally with the means of a linear program becomes inefficient. Thus, in addition, we develop an anytime heuristic algorithm, called *Edu2Com*, that yields high-quality solutions to the NOMTMT-AP.

Moreover, in an era where many hard and complex procedures are automated with the aid of artificial intelligence, the need for humans to understand the rationale behind AI decisions becomes imperative. Given an artificially intelligent tool for forming human teams, explaining why and how the tool is making certain decisions is essential. Adequate explanations for decisions made by an intelligent system do not just help describe how the system works; they also earn users' trust. Towards trustworthy team formation tools, in this dissertation, we also propose a general methodology for justifying why a team formation algorithm at hand formed certain teams and disregarded others. We devise an algorithm that wraps up any existing team formation algorithm and builds justifications regarding the teams formed without modifying the team formation algorithm. Our algorithm offers users a collection of commonly-asked questions within a team formation scenario and builds justifications as contrastive explanations. In addition, we investigate privacy issues upon providing explanations in the context of team formation.

These tools can be used in a good deal of real-life applications. For instance, in this work, we have employed our tools to aid teachers from student teams to undertake a school/university project, form teams in crowdsourcing events, and form teams of volunteers to carry out social impact tasks.

MSc thesis

Title: *Hedonic Games in the Real World: Machine Learning and Theoretical Extensions*

Supervisor: Georgios Chalkiadakis

url: https://bit.ly/3Vy6CXt

Diploma thesis

Title: *A serious game approach to promote cooperative civic actions at local level*

Supervisor: Georgios Chalkiadakis

url: https://bit.ly/3g4lTPl