

**CONTACT INFORMATION**      **For online security purposes, full contact information is available only on request.**  
 an.liapis@gmail.com

**EDUCATION**      **IT University of Copenhagen**, Copenhagen, Denmark

PhD candidate, September 2011–2014

- Thesis Topic: Searching for Sentient Design Tools for Game Development
- Thesis Supervisor: Associate Professor Georgios N. Yannakakis
- Thesis Focus: Search-Based Procedural Content Generation, Computer-Aided Design

M.Sc., Information Technology, March 2011      GPA: 11.25 (7-step scale) <sup>1</sup>

- Study Programme: Media Technology and Games
- Specialty Line: Technology
- Thesis Topic: Optimizing Game Elements Based on Aesthetic and Performance Principles and Affected by Player Preferences
- Thesis Supervisor: Associate Professor Georgios N. Yannakakis

**National Technical University of Athens**, Athens, Greece

Diploma, Electrical and Computer Engineering, June 2007      GPA: 7.62 (10 scale) <sup>2</sup>

- Specialty Direction: Information Technology
- Thesis Topic: Human-Machine Interaction with a Focus on Character Animation
- Thesis Supervisor: Professor Stefanos Kollias

**POSITIONS**      **Lecturer** (October 2015 - Present), Institute of Digital Games, University of Malta, Msida, Malta.

**Postdoctoral Fellow** (September 2014 - September 2015), Institute of Digital Games, University of Malta, Msida, Malta.

**PROJECTS**      Co-PI of the Horizon 2020 project ENVISAGE: ENhance VIRTUAL learning Spaces using Applied Gaming in Education (project no: 731900)

Co-PI of the Horizon 2020 project CrossCult: Empowering reuse of digital cultural heritage in context-aware crosscuts of European history (project no: 693150)

Research Support Officer with the FP7 ICT project C2Learn: Creative Emotional Reasoning Computational Tools Fostering Co-Creativity in Learning Processes (project no: 318480)

Affiliated with the FP7 Marie Curie CIG project AutoGameDesign: Autonomous Computational Game Designers - Transforming Exploration via Deep Learning, Novelty Search and Emotive Modelling (project no: 630665)

Research Associate with the FP7 ICT project SIREN: Social games for conflict Resolution based on natural interaction (project no: 258453)

**RESEARCH INTERESTS**      Computer-aided design (AI-assisted design, mixed-initiative design, co-creativity)  
 Artificial intelligence (computational creativity, agent control, steering behaviors, reinforcement learning)

<sup>1</sup>ECTS Equivalent: A (Excellent)

<sup>2</sup>ECTS Equivalent: B (Very Good)

Procedural content generation (level generation, visual asset creation, digital aesthetics)

User modeling (designer modeling, player decision modeling, procedural personas)

Artificial evolution (neuroevolution, constrained optimization, novelty search, genetic algorithms)

Machine learning (neural networks, deep learning, gradient search)

**PERSONAL SKILLS AND COMPETENCES** **Languages:** Greek (native), English (proficient), French (proficient), German (basic), Danish (beginner).

**Computer Programming:** C, C++, Java, C# / XNA, OpenGL, Actionscript 3, Pascal, Processing, Python, Prolog, Visual Basic, TorqueScript, VRML, Fortran, PHP, JavaScript, HTML.

**Desktop Applications:** Microsoft Office, Autodesk 3DS Max, Ulead Photoimpact, Adobe Illustrator, Adobe Flash, Adobe Photoshop, Mathworks Matlab.

**Game Engines:** Unreal Engine 3, Ogre SDK, Unity 3D, Torque Game Engine.

**PUBLICATIONS (BOOK CHAPTERS)** Shaker, N., Liapis, A., Togelius, J., Lopes, R. and Bidarra, R.: "Constructive generation methods for dungeons and levels" In Procedural Content Generation in Games: A Textbook and an Overview of Current Research, Springer, 2016.

Liapis, A., Smith, G. and Shaker, N.: "Mixed-initiative Content Creation" In Procedural Content Generation in Games: A Textbook and an Overview of Current Research, Springer, 2016.

**PUBLICATIONS (JOURNALS)** Liapis, A., Yannakakis, G.N., Alexopoulos, C. and Lopes, P.: "Can Computers Foster Human Users' Creativity? Theory and Praxis of Mixed-Initiative Co-Creativity," Digital Culture & Education (DCE), 8 (2). 2016.

Holmgård, C., Liapis, A., Togelius, J., Yannakakis, G.N., and Togelius, J.: "Evolving models of player decision making: Personas versus clones," Entertainment Computing, 2015.

Liapis, A., Yannakakis, G.N., and Togelius, J.: "Constrained Novelty Search: A Study on Game Content Generation," Evolutionary Computation 21(1), 2015, pp. 101–129. **ISI impact factor: 3.733<sup>3</sup>**

Liapis, A., Yannakakis, G.N., and Togelius, J.: "Adapting models of visual aesthetics for personalized content creation," IEEE Transactions on Computational Intelligence and AI in Games 4(3), 2012, pp. 213–228. **ISI impact factor: 1.694**

**PUBLICATIONS (CONFERENCES)** Sacco, O., Liapis, A. and Yannakakis, G.N.: "A Holistic Approach for Semantic-Based Game Generation," in Proceedings of the IEEE Conference on Computational Intelligence and Games (CIG). 2016.

Gravina, D., Liapis, A. and Yannakakis, G.N.: "Constrained Surprise Search for Content Generation," in Proceedings of the IEEE Conference on Computational Intelligence and Games (CIG). 2016.

Karavolos, D., Liapis, A. and Yannakakis, G.N.: "Evolving Missions to Create Game Spaces," in Proceedings of the IEEE Conference on Computational Intelligence and Games (CIG). 2016.

Yannakakis, G.N. and Liapis, A.: "Searching for Surprise," in Proceedings of the International Conference on Computational Creativity. 2016.

<sup>3</sup>ISI impact factors calculated at the date of publishing.

Lopes, P., Liapis, A. and Yannakakis, G.N.: "Framing Tension for Game Generation," in Proceedings of the International Conference on Computational Creativity. 2016.

Barros, G.A.B., Liapis, A., and Togelius, J.: "Murder Mystery Generation from Open Data," in Proceedings of the International Conference on Computational Creativity. 2016.

Lim, C., Liapis, A., and Harrell, D.F.: "Discovering Social and Aesthetic Categories of Avatars: A Bottom-Up Artificial Intelligence Approach Using Image Clustering," in Proceedings of the International Joint Conference of DiGRA and FDG. 2016.

Barros, G.A.B., Liapis, A., and Togelius, J.: "Playing with Data: Procedural Generation of Adventures from Open Data," in Proceedings of the International Joint Conference of DiGRA and FDG. 2016.

Gravina, D., Liapis, A., and Yannakakis, G.N.: "Surprise Search: Beyond Objectives and Novelty," in Proceedings of the Genetic and Evolutionary Computation Conference. ACM, 2016.

Liapis, A.: "Exploring the Visual Styles of Arcade Game Assets," in Proceedings of Evolutionary and Biologically Inspired Music, Sound, Art and Design (EvoMusArt). Springer, 2016.

Lopes, P., Liapis, A., Yannakakis, G.N.: "Targeting Horror via Level and Soundscape Generation," in Proceedings of the AAAI Artificial Intelligence for Interactive Digital Entertainment Conference, 2015.

Liapis, A., Yannakakis, G.N.: "Refining the Paradigm of Sketching in AI-Based Level Design," in Proceedings of the AAAI Artificial Intelligence for Interactive Digital Entertainment Conference, 2015.

Cachia, W., Liapis, A., Yannakakis, G.N.: "Multi-Level Evolution of Shooter Levels," in Proceedings of the AAAI Artificial Intelligence for Interactive Digital Entertainment Conference, 2015.

Liapis, A., Hoover, A.K., Yannakakis, G.N., Alexopoulos, C., Dimaraki, E.V.: "Motivating Visual Interpretations in Iconoscope: Designing a Game for Fostering Creativity," in Proceedings of the 10th Conference on the Foundations of Digital Games, 2015.

Liapis, A., Holmgård, C., Yannakakis, G.N., Togelius, J.: "Procedural Personas as Critics for Dungeon Generation," in Applications of Evolutionary Computation, vol. 9028, LNCS. Springer, 2015. **(Best Paper Award of the EvoGAMES track)**

Zhang, J., Tarnby, R., Liapis, A., Risi, S.: "DrawCompileEvolve: Sparking Interactive Evolutionary Art with Human Creations," in Evolutionary and Biologically Inspired Music, Sound, Art and Design (EvoMusArt), vol. 9027, LNCS. Springer, 2015.

Hoover, A.K., Cachia, W., Liapis, A., Yannakakis, G.N.: "AudiolnSpace: Exploring the Creative Fusion of Generative Audio, Visuals and Gameplay," in Evolutionary and Biologically Inspired Music, Sound, Art and Design (EvoMusArt), vol. 9027, LNCS. Springer, 2015.

Holmgård, C., Liapis, A., Togelius, J., Yannakakis, G.N.: "Personas versus Clones for Player Decision Modeling," in Proceedings of the International Conference on Entertainment Computing (ICEC), 2014.

Liapis, A., Yannakakis, G.N. and Togelius, J.: "Designer Modeling for Sentient Sketchbook," in Proceedings of the IEEE Conference on Computational Intelligence and Games (CIG), 2014. **(Best Paper Award)**

Preuss, M., Liapis, A., and Togelius, J.: "Searching for Good and Diverse Game Levels," in Proceedings of the IEEE Conference on Computational Intelligence and Games (CIG), 2014. **(Best Paper Nominee)**

Holmgård, C., Liapis, A., Togelius, J., Yannakakis, G.N.: "Evolving Personas for Player Decision Modeling," in Proceedings of the IEEE Conference on Computational Intelligence and Games (CIG), 2014.

Liapis, A., Yannakakis, G.N. and Togelius, J.: "Computational Game Creativity," in Proceedings of the Fifth International Conference on Computational Creativity, 2014.

Yannakakis, G.N, Liapis, A., Alexopoulos, C.: "Mixed-Initiative Co-Creativity" in Proceedings of the 9th Conference on the Foundations of Digital Games, 2014.

Holmgård, C., Liapis, A., Togelius, J., Yannakakis, G.N.: "Generative Agents for Player Decision Modeling in Games," in Poster Proceedings of the 9th Conference on the Foundations of Digital Games, 2014.

Liapis, A., Yannakakis, G.N., and Togelius, J.: "Towards a Generic Method of Evaluating Game Levels," in Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment, 2013. (**Best Student Paper Award**)

Liapis, A., Martínez, H.P., Togelius, J. and Yannakakis, G.N.: "Adaptive Game Level Creation through Rank-based Interactive Evolution," in Proceedings of the IEEE Conference on Computational Intelligence and Games (CIG), 2013. (**Best Paper Nominee**)

Liapis, A., Yannakakis, G.N., and Togelius, J.: "Enhancements to Constrained Novelty Search: Two-Population Novelty Search for Generating Game Content," in Proceedings of Genetic and Evolutionary Competition Conference (GECCO), 2013. (**Best Paper of the DETA/Self\* Track**)

Liapis, A., Martínez, H.P., Togelius, J. and Yannakakis, G.N.: "Transforming Exploratory Creativity with DeLeNoX," in Proceedings of the Fourth International Conference on Computational Creativity, 2013.

Liapis, A., Yannakakis, G.N., and Togelius, J.: "Sentient Sketchbook: Computer-Assisted Game Level Authoring," in Proceedings of the 8th Conference on the Foundations of Digital Games (FDG), 2013.

Liapis, A., Yannakakis, G.N., and Togelius, J.: "Sentient World: Human-Assisted Procedural Cartography," in Proceedings of Evolutionary and Biologically Inspired Music, Sound, Art and Design (EvoMusArt), vol. 7834, LNCS. Springer, 2013, pp. 180-191.

Liapis, A., Yannakakis, G.N., and Togelius, J.: "Generating Map Sketches for Strategy Games," in Proceedings of Applications of Evolutionary Computation, vol. 7835, LNCS. Springer, 2013, pp. 264-273.

Liapis, A., Yannakakis, G.N., and Togelius, J.: "Optimizing Visual Properties of Game Content through Neuroevolution", in Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), 2011.

Liapis, A., Yannakakis, G.N., Togelius, J.: "Neuroevolutionary constrained optimization for content creation," in Proceedings of the IEEE Conference on Computational Intelligence and Games (CIG), 2011, pp. 71-78.

PUBLICATIONS  
(WORKSHOPS)

Liapis, A., Yannakakis, G.N.: "Boosting Computational Creativity with Human Interaction in Mixed-Initiative Co-Creation Tasks," in Proceedings of the ICCG workshop on Computational Creativity and Games. 2016.

Holmgård, C., Liapis, A., Togelius, J., Yannakakis, G.N.: "Monte-Carlo Tree Search for Persona Based Player Modeling," in Proceedings of the AIIDE workshop on Player Modeling, 2015.

Liapis, A.: "Map Sketch Generation as a Service," in Proceedings of the AIIDE workshop on Experimental AI in Games, 2015.

Lopes, P., Liapis, A., Yannakakis, G.N.: "Sonancia: Sonification of Procedurally Generated Game Levels," in Proceedings of the ICCG workshop on Computational Creativity & Games, 2015.

Abela, R., Liapis, A., Yannakakis, G.N.: "A Constructive Approach for the Generation of Underwater Environments," in Proceedings of the FDG Workshop on Procedural Content Generation, 2015.

Barros, G.A.B., Liapis, A., Togelius, J.: "Data Adventures," in Proceedings of the FDG Workshop on Procedural Content Generation, 2015.

Risi, S., Zhang, J., Taarnby, R., Greve, P., Piskur, J., Liapis, A., Togelius, J.: "The Case for a Mixed-Initiative Collaborative Neuroevolution Approach," in Proceedings of the ALIFE workshop on Artificial Life and the Web, 2014.

Togelius, J., Nelson, M.J., Liapis, A.: "Characteristics of Generatable Games," in Proceedings of the FDG Workshop on Procedural Content Generation, 2014.

Liapis, A., Yannakakis, G.N., Togelius, J.: "Designer Modeling for Personalized Game Content Creation Tools," in Proceedings of the AIIDE Workshop on Artificial Intelligence & Game Aesthetics, 2013.

Liapis, A., Yannakakis, G.N., Togelius, J.: "Limitations of Choice-Based Interactive Evolution for Game Level Design," in Proceedings of the AIIDE Workshop on Human Computation in Digital Entertainment, 2012.

## AWARDS

**Best Reviewer Award** at the Artificial Intelligence and Interactive Digital Entertainment conference, 2015.

**Best Paper Award** at the European Conference on the Applications of Evolutionary Computation [EvoGames track] for the paper "Procedural Personas as Critics for Dungeon Generation", 2015.

**Best Paper Award** at the Computational Intelligence and Games conference for the paper "Designer Modeling for Sentient Sketchbook", 2014.

Nominated for Best Paper Award at the Computational Intelligence and Games conference for the papers "Searching for Good and Diverse Game Levels", 2014.

**Best Student Paper Award** at the Artificial Intelligence and Interactive Digital Entertainment conference for the paper "Towards a Generic Method of Evaluating Game Levels", 2013.

**Best Paper Award** at the Genetic and Evolutionary Computation Conference [DETA/Self\* track] for the paper "Enhancements to Constrained Novelty Search: Two-Population Novelty Search for Generating Game Content", 2013.

Nominated for Best Paper Award at the Computational Intelligence and Games conference for the paper "Adaptive Game Level Creation through Rank-based Interactive Evolution", 2013.

**European Learning Game of 2013** award: SIREN (Social games for conflict Resolution based on natural interaction). Games and Learning Alliance Network of Excellence, 2013.

Make Something Unreal competition, 2009.

- Educational Category: **1st Place** (IT University of Copenhagen, contribution from The Witching Hour).
- Best FPS Mod: Finalist (project: The Witching Hour).
- Best Level for a Mod: Honorable Mention (project: The Witching Hour).

TEACHING  
EXPERIENCE**IT University of Copenhagen**, Copenhagen, Denmark

Guest Lecturer: Procedural Content Generation **Fall 2014**  
 Guest Lecturer: Procedural Content Generation **Fall 2013**  
 Co-lecturer: Modern AI for Games **Fall 2012**  
 Co-lecturer: Advanced Topics in Game Technology **Fall 2012**  
 Co-lecturer: Modern AI for Games **Fall 2011**  
 Co-lecturer: Procedural Content Generation **Fall 2011**  
 Teaching Assistant: Modern AI for Games **Fall 2010**

Co-supervisor of 3 M.Sc. Theses (Andrea Distler, Konstantinos Kontostathis, Jinhong Zhang & Rasmus Enemark Taarnby).

Co-supervisor of 2 small projects (Konstantinos Kontostathis, Lasse Jørgensen).

**University of Malta**, Msida, Malta

Lecturer: Computational Game Creativity **Spring 2017**  
 Co-lecturer: Affective Computing and Player Experience **Spring 2017**  
 Co-lecturer: Data Mining and Game Analytics **Spring 2017**  
 Co-lecturer: Game Development **Spring 2017**  
 Lecturer: Prototyping for Game Designers **Fall 2016**  
 Lecturer: Computational Game Creativity **Spring 2016**  
 Co-lecturer: Game Development **Spring 2016**  
 Lecturer: Prototyping for Game Designers **Fall 2015**  
 Guest Lecturer: Advanced Game AI (BSc level) **Fall 2015**  
 Co-lecturer: Experience Design **Spring 2015**  
 Guest Lecturer: Game AI Revisited **Spring 2015**  
 Guest Lecturer: Advanced Game AI (BSc level) **Fall 2014**  
 Guest Lecturer: Game AI Revisited **Spring 2014**  
 Guest Lecturer: Game Technology **Fall 2012**

Supervisor of 2 M.Sc. Theses (Casper Boserup, Edward Bamblar), co-supervisor of 1 B.Sc. Thesis (Georgi Beshovski).

## REVIEWER

Reviewer for the following journals: IEEE Transactions on Systems, Man, and Cybernetics; IEEE Transactions on Evolutionary Computation; IEEE Transactions on Computational Intelligence and Games; IEEE Transactions on Human-Machine Systems; Neural Computing and Applications; Artificial Intelligence Journal; Entertainment Computing; Signal, Image and Video Processing.

Member of the Program Committee for AI and Interactive Digital Entertainment (2014–2016); Foundations of Digital Games (2014–2016); IEEE Conference on Computational Intelligence and Games (2013–2016); ACM Genetic and Evolutionary Computation Conference (2014–2016); International Conference on Computational Creativity (2015–2016); International Conference on Evolutionary and Biologically Inspired Music, Sound, Art and Design (2014–2016); Bio-inspired Algorithms in Games (2015–2016); AIIDE Workshop on Experimental AI in Games (2014–2016); FDG Workshop on Procedural Content Generation (2012, 2015–2016); Computer Science and Electronic Engineering Conference (2015–2016).

ORGANIZATIONAL  
ACTIVITIES

Guest editor of the special Issue on AI-based and AI-assisted Game Design in IEEE Transactions on Computational Intelligence and Games.

Publication chair of the 6th International Conference on Computational Intelligence in Music, Sound, Art and Design – EvoMusArt (2017).

Local chair for the IEEE Conference on Computational Intelligence and Games (2016).

Organizer of the 2nd ICCG workshop on Computational Creativity and Games (2016).

Organizer of the 2nd AIIDE workshop on Experimental AI in Games (2015).  
Organizer of the 6th FDG workshop on Procedural Content Generation in games (2015).  
Organizer of the SETN tutorial and special session on Game Artificial Intelligence (2014).  
Organizer of the First AIIDE workshop on Artificial Intelligence & Game Aesthetics (2013).  
Student helper in the 8th Conference on the Foundations of Digital Games (2013) and IEEE Conference on Computational Intelligence and Games (2010).

ARMED SERVICE Mandatory armed service has been fulfilled (February 2008).

OTHER SERVICES Local organizer of the Global Game Jam Malta (2014-2017) and the Mediterranean Game Jam (2015).

Intro guide for new students in the Media Technology and Games program (2010).

Participant in the Nordic Game Jam (2009 and 2010) and Global Game Jam Malta (2016).

#### GAMES

**The Witching Hour Game:** A multiplayer First-Person Horror/Survival game with asymmetrical power levels between the mortal team and the ghost team and team-swaps on death. The ghosts are invisible and invulnerable, but lose the game when time runs out and thus must possess mortal bodies causing the mortal player to become a ghost. Developed using the Unreal 3 Engine.

**The One Game:** 2D experimental mini-game collection around the notion of one (as a number and as a symbol), including physics and logic puzzles. Written in XNA 3.0 (C#).

**The Lobbyist:** Multi-player satiric mini-game on large corporations' indifference to environmental pollution, inspired by the prisoner's dilemma. Written in Processing.

**KeeKeeReeKoo:** Experimental game using motion capture and colorful outfits, with the player simulating a chicken (includes flapping wings and pecking). Written in Processing.

REFERENCES Available upon request.