Georgios Methenitis

Nationality: Hellenic (Greek)
Date of Birth: 10 October 1988
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Education

Sep. 2012 to Nov. 2014 **Master of Artificial Intelligence** (2-year M.Sc.)
University of Amsterdam

Thesis: Evolution of soft robots by novelty search.

In association with the Advanced Concepts Team, ESA-ESTEC.

Abstract Soft robotics is a vivid research field on the science and engineering aspects of soft materials in mobile machines. Recent development in soft robotics and evolutionary optimization have shown the ability to simultaneously evolve the morphology and locomotion of soft robots. Generative encoding coupled with neural evolution of augmented topologies shows promising results. Novelty search, unlike traditional optimization methods does not aim to optimize the objective but instead looks for novelty. Novelty search rewards diversity and leads to a variety of solutions, mimicking natural evolution. Apart from the performance comparison between novelty and fitness based search, this thesis shows that new locomotion patterns can be produced by the former while different types of selection algorithms for fitness and novelty based evolution are studied. In addition, a method to combine both is proposed. Finally, the objective-wise performance is tested under variant gravity conditions leading into a taxonomy of possible locomotion strategies given different gravity levels. **Grade** 9.0/10.0. Online version.

Sep. 2006 to Aug. 2012 **Electronic and Computer Engineering** (5-year Diploma)
Technical University of Crete

Thesis: Player Behavior and Team Strategy for the RoboCup 3D Simulation League.

Abstract A complete team design for the RoboCup 3D Simulation League focusing on the multi-agent aspect of the game, the player behavior, team strategy, and team coordination. The proposed approach was based on first sharing and fusing information about the game state and then decomposing the global coordination problem for 11 players to smaller coordination problems over dynamically-determined subsets of players adhering to an adaptive global team formation. **Grade** 10.0/10.0. Online version.

Sep. 2003 to Jul. 2006 **High School Education**, *Lyceum of Psachna, Evia, Greece*

Selected Courses

Technical University of Crete

- Autonomous Agents
- Machine Vision
- Wireless Telecommunication Systems and Networks
- Structured Programming
- Object-oriented Programming
- Operating Systems
- Computational Science

University of Amsterdam

- Autonomous Agents
- Advanced Topics in Autonomous Agents
- Machine Learning - Pattern Recognition & Principles and Methods
- Intelligent Multimedia Systems
- Multimedia Information Systems
- Information Retrieval
- Language Processing
- Computer Vision

Technical Skills

Programming Languages

C++ (Boost, OpenCV, STL, PCL, Qt, CMake), Java, Python, C#, C, SQL, Scripting - Unix, HTML/CSS, LaTeX

Computer and OS

Proficient in GNU/Linux (Arch, Debian, RedHat), Microsoft Windows, MacOS

Software

Microsoft and other Office Tools, Eclipse IDE, NetBeans, Qt Creator, Matlab, MySQL, MS Visual Studio, NAO Choregraphe, NaoQI, Urbi

Robot Platforms and Simulators

Aldebaran NAO, Sony AIBO, Webots Robot Simulator, Spark, VoxCad

Research Interests

- Multi-Agent Systems (Learning / Collaboration / Competition)
- Machine Learning (Deep Learning, Reinforcement Learning, Un-Supervised Learning)
- Evolutionary Algorithms & Robotics
- AI in game development
- Computer Vision
- *Other fields of interest:* Computational Theory, Algorithms and Complexity, Robotics (Motion Control, Kinematics)

Work Experience

Jun. 2014 to Sep. 2014 — **Advanced Concepts Team**, ESA-ESTEC

Position: Internship

Project: Thesis: *Evolution of soft robots by novelty search.*

Description: During my 3-month internship at the Advanced Concepts Team under the European Space Agency, I worked on my master thesis supervised by the scientific coordinator and a research fellow of the team. The evolution of the morphologies of soft robotic structures by novelty search and a generative encoding, alongside with the effect of gravity conditions in the evolved shapes were investigated.

Jan. 2013 to Mar. 2014 — **Dutch Nao Team**, UvA

Position: Software Developer - Main Programmer / Programming Coordinator

Description: Robocup SPL is a league where robot (Aldebaran NAOs) players compete in football matches autonomously, depending only on their sensors (camera, sonar) and actuating to the environment using their motors. In these dynamical environments, agents are forced to use AI and computer vision techniques in order to perceive the environment correctly and decide their actions under a teamwork framework. As the main programmer in DNT, my job was both the design and the implementation of techniques for the code-base of the robots. I was also responsible for the coordination of the team in regards to the development of the code base.

Oct. 2013 to Feb. 2014 — **University of Amsterdam**

Position: Teaching Assistant

Course: C++ Programming Methods

Description: As a teaching assistant in the course C++ programming language, I was responsible for the lab-sessions held during the course, helping students learn and work with the C++ programming language.

Oct. 2013 to Feb. 2014 — **VicarVision**

Position: Internship

Project: Floor Boundaries-Plane and Camera Pose Estimation Using Human Detection for Surveillance Monocular Cameras

Description: Three dimensional estimation of a scene using video-frames taken by a monocular surveillance cameras is a challenging topic. In this project a human detector was used together with depth estimation methods for geometrical structures in the scene, as well as, a floor boundary detection module to extract three dimensional information of the scene.

Publications

Team Description Papers

P. De Kok, N. Girardi, A. Gudi, *et al.*, "Team description for robocup 2013 in eindhoven, the netherlands," *Proceedings of the 17th RoboCup International Symposium (May 2013)*, 2013

Projects

A. Gudi, P. de Kok, G. K. Methenitis, *et al.*, "Feature detection and localization for the robocup soccer spl," *Project report, Universiteit van Amsterdam (February 2013)*, 2013

Conference Proceedings

G. Methenitis, P. M. de Kok, S. Nugteren, *et al.*, "Orientation finding using a grid based visual compass," 2013

Competitions

April 2013 Participation with Dutch Nao Team in Iran Open 2013, Robocup, Standard Platform League, 3rd place.

July 2013 Participation with Dutch Nao Team in Robocup 2013, Robocup, Standard Platform League, finished in top-16 teams.

Languages

- Greek - Mother Tongue
- English
  - Michigan Lower Certificate in English, May 2009
  - Michigan Proficiency Certificate in English, November 2011
  - TOEFL Internet-Based-Test, Score: 93/120, July 2012
- German
  - Zertifikat Deutsch, July 2005
- Dutch
  - Basic familiarity, taking lessons

Other Interests - Extra Curriculum Activities

- Football, Running
- Movies, Science fiction & Scientific Books, Video Games
- Travelling

References

References can be provided upon request from current and previous employers, and senior academic staff at both the University of Amsterdam and Technical University of Crete.