HELLENIC REPUBLIC
National and Kapodistrian University of Athens
EST. 1837

DEPARTMENT OF INFORMATICS & TELECOMMUNICATIONS

Scientific Research

Excellence, Distinctions, Innovation

Prof. Antonis Paschalis
Chair of the Department

2018

Department Identity

The Department of Informatics and Telecommunications started as an interdisciplinary program of undergraduate studies of the Departments of Physics and Mathematics in 1986 and became an independent Department in 1989

It is a member of the 7 Departments of the School of Sciences of the National and Kapodistrian University of Athens

Supports the following curricula:

- ✓ undergraduate with 6 specializations
- ✓ 3 postgraduate
- ✓ Ph.D.

Participates in 8 interdisciplinary postgraduate study programs

Graduates :

USP: 2.952 PSP: 1.577 Ph.D.: 312

Vision

The Department of Informatics and Telecommunications aims to be an international point of reference with respect to both quality of education and research excellence at international level.

Our vision is based on common goals and mutual commitments between the academic staff, the students and the administrative and technical staff of the Department:

- ✓ among the best in the development of cutting-edge technologies and scientific and social exploitation of knowledge
- ✓ among the best in research and international collaborations
- ✓ among the pioneers in social supply in scientific and technological fields related to our cognitive subjects

Member of INFORMATICS EUROPE

Educational Goals – Undergraduate Studies

The DIT Department offers a modern undergraduate curriculum, based on Information Science curriculums (Computer Science and Engineering), jointly proposed by leading international scientific organizations:

- ✓ **Association for Computing Machinery (ACM) και**
- ✓ **Institute of Electronics and Electrical Engineers (IEEE) - Computer Society**

enriched with an up to date course cycle in Telecommunications and Signal Processing

Bachelor's degree that certifies, apart from basic knowledge in Information Technology and Telecommunications, focused knowledge in cross-sector specializations, where the Department has acquired excellence in research at international level:

- ✓ **Theoretical foundations**
- ✓ **Data and knowledge management**
- ✓ **Software**
- ✓ **Hardware and architecture**
- ✓ **Telecommunications and networking**
- ✓ **Signal and information processing**

Interdisciplinary Postgraduate Study Programs

The DIT Department offers modern post graduate studies:

- ✓ **MSc in Informatics with specializations in**
  - Computer Science Foundations and Applications
  - Data, Information and Knowledge Management
  - Computer Systems: Software and Hardware
- ✓ **MSc in Computer, Telecommunicatios and Network Engineering with specializations in**
  - Computer Engineering
  - Telecommunications and Signal Processing
  - Computer Networking
- ✓ **MSc in Information and Communication Technologies**

Postgraduate Study Programs

The DIT Department offers modern postgraduate studies:

- ✓ **MSc in Algorithms, Logic, and Discrete Mathematics**
- ✓ **MSc in Data Science and Information Technologies with specializations in**
  - ➢ **Big data and Artificial Intelligence**
  - ➢ **Bioinformatics – Biomedical data science**
- ✓ **MSc in Management and Economics of Telecommunication Networks and Information Systems**
- ✓ **MSc in Telecommunications and Network Secured Systems**

The DIT Department supports 4 postgraduate study programs offered by other departments

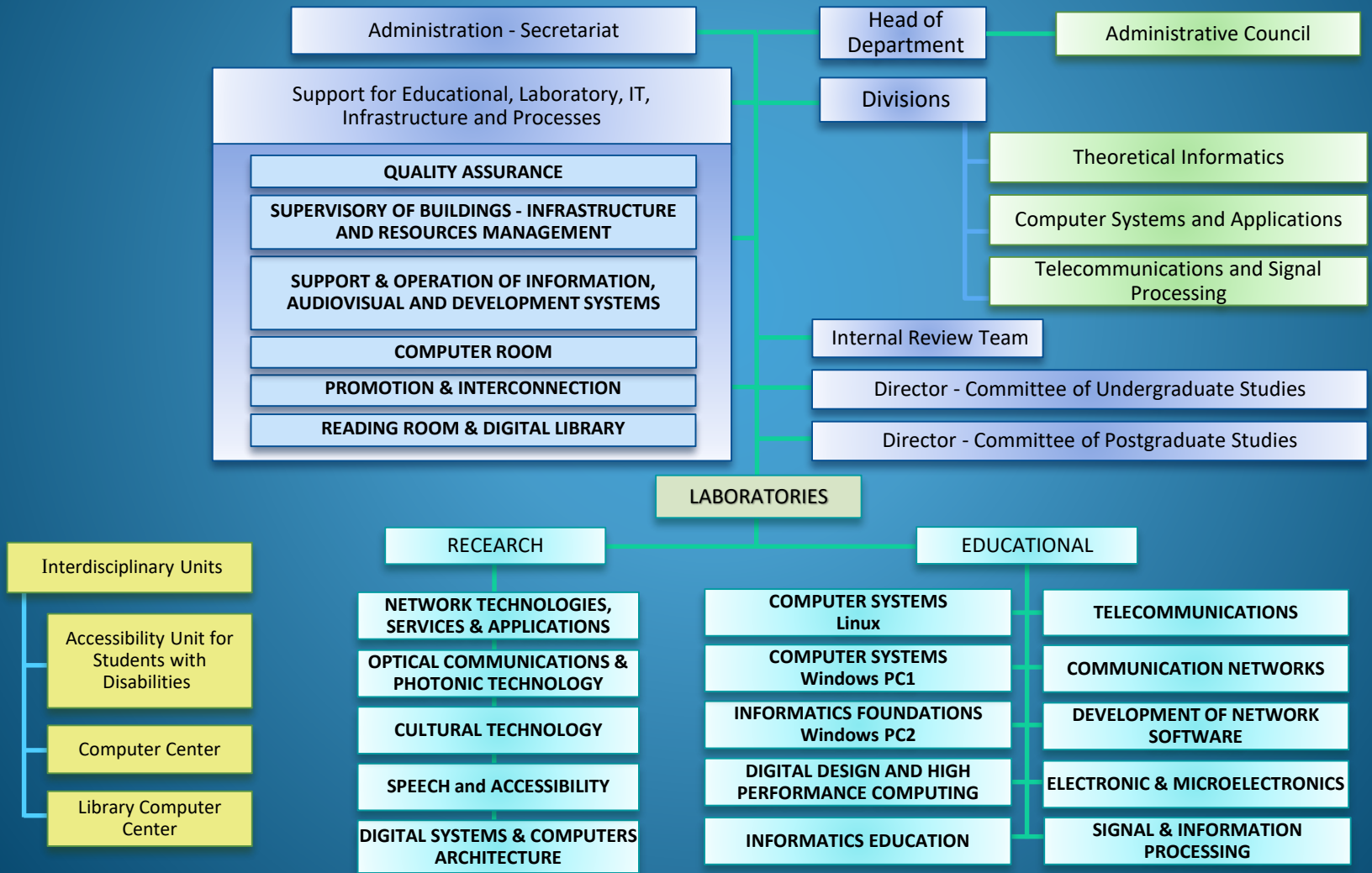
Department Evaluation

The Committee responsible for the External Evaluation of the Department of Informatics & Telecommunications (May 2011), consisted of five university professors from abroad, states:

"Overall, the committee felt that this is an excellent Department, one of the best in the country (certainly the best among 4-year programmes in the subject of study) that deserves support and encouragement by the Greek State and the National Kapodistrian University of Athens"

According to the annual evaluation carried out by ARWU, the Department of Informatics and Telecommunications of NKUA was ranked in the top 100 departments worldwide for the period 2009 - 2011

Structure - Organization



Human Resources & Teaching Work

21 Professors + 8 Emeritus Prof.

8 Associate Professors

7 Assistant Professors

17 LTS, 5 STLS, 6 AS

The Department offers yearly 170 courses in Undergraduate & Graduate Programs

- ✓ 84 laboratory courses
- ✓ 20 tutorial courses
- ✓ 4.160 laboratory hours
- ✓ 1.092 hours of practical training (assistantship)

240 Dissertation & Diploma Theses completed each year

Infrastructures

- ✓ 3 Amphitheaters (300, 100, 100 seats)
- ✓ 6 Teaching rooms
- ✓ 3 Meeting rooms
- ✓ 1 Reading room
- ✓ 5 Αυτοτελή Laboratories
- ✓ 10 Independent Laboratories
- ✓ Computer Room

Support for live broadcast classroom lectures

Ability to view recorded lectures on the Internet










Honors - Awards

4 IEEE Fellows (2013 , 2010, 2008, 2007)
ACM Fellow(2004)
EURASIP Fellow (2011)
Member of Academia Europea (2011)
Member of Royal Society of Edinburgh (2009)

14 Best Paper Award
8 Best Student Paper Award
3 PhD Thesis Award

Gödel Prize from ACM SIGART for introducing what is today known as the "price of anarchy", the first quantitative measure of the degree of inefficiency of equilibria in game theory (2012)

IEEE Signal Processing Society - Education Award (2014)
Athanasios Papoulis Award for Sustained Fundamental Contributions to Research and Education in Signal Processing and Machine Learning (2014)
Xanthopoulos-Pnevmatikos Award for Excellence in Teaching (ITE) (2006)

2017 Satellite & Space Communication Distinguished Service Award

2 Golden Core Member from IEEE Computer Society (2002, 2005)
Continues/Meritorious Service Award from IEEE CS (2005, 2007, 2013)
Meritorious Service Award from EURASIP (2014)
ACM SIGMOD Contributions Award (2017)

Research Excellence Funding

- 1 European Research Council (ERC) Advanced Grant
  - ALGAME (Algorithms, Games, Mechanisms, and the Price of Anarchy)
- 3 European Research Council (ERC) Starting Grants
  - SPADE: Sophisticated Program Analysis, Declaratively
  - PPP: Protecting and Preserving Human Knowledge for Posterity
  - CODAMODA: Controlling Data Movement in the Digital Age
- 1 Marie Curie Chair Program
  - MMng: Architecting Next-Generation Multimedia Systems
- Yahoo Faculty Research and Engagement Program Award (2015)
- IBM Faculty Award (2016)
- Google Faculty Research Program Award (2017)

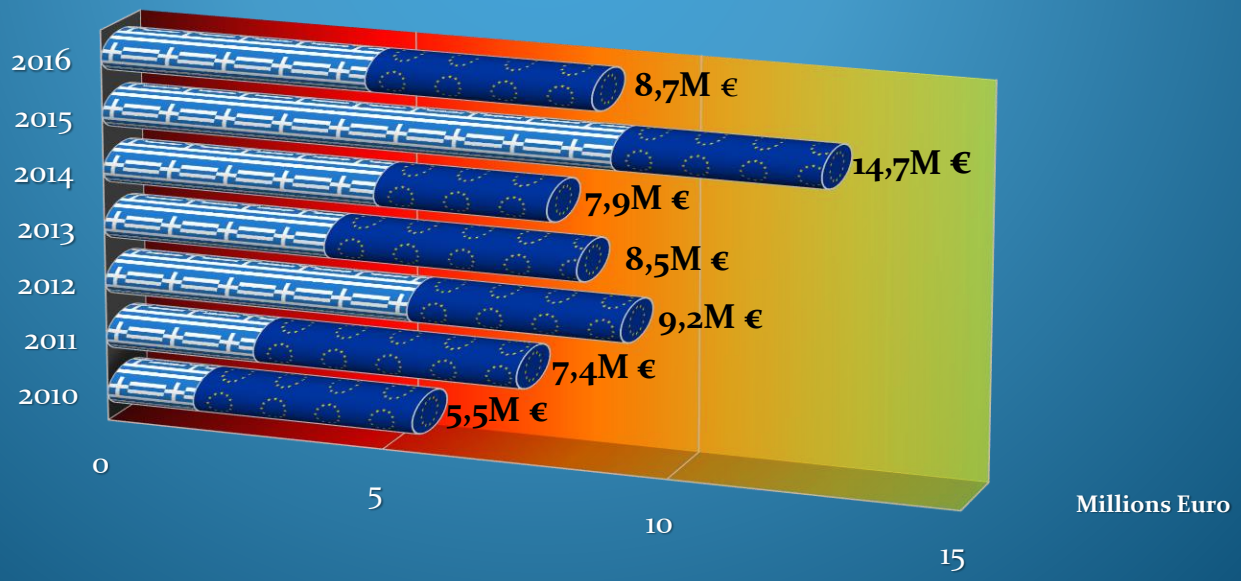
Research Excellence Funding

- 9 Projects of Action Excellence I & II
  - **ART-IN-SPACE:** Adaptive, Robust to Threats, Immune to Nonlinearities, Sparse Opportunistic Cognitive Radio
  - **ASSURANCE:** Adaptive Sparsity-Aware Distributed Learning with Applications to Cognitive Radio
  - **CONECT:** Chaos Optical Networks: from Sensing to Cryptography
  - **ESPRESSO:** Exploiting Structure in Polynomial Equation and System Solving for Geometric and Game Modelling
  - **FINER:** Towards Fully Integrated Elections and Referendum Systems
  - **MMD:** Mining Mobility Data
  - **Morph-PL:** Advanced Programming Languages with Class Morphing
  - **SCARE:** Scalable Reasoning and Query Processing for Linked Geospatial Data
  - **SCORPIUS:** Single-Chip Radiation Tolerant Dynamically Reconfigurable Payload Data Processing Units for Future Space Applications
  - **StochSoCs:** Flexible Systems on Chip for Parallel Stochastic Simulation of large biochemical networks in Systems Biology

Funding

- ✓ Total Research and Development 61.685.200 € (2010-2016)
- ✓ 219 active Research Projects in 2016
- ✓ The research funding of the Department constitutes 18% - 20% of the total research funding of NKUA
- ✓ In absolute numbers, the Department contributes about 8M € annually to the NKUA and over 4M € per year in the Greek economy (foreign exchange)

Total Research and Development Funds



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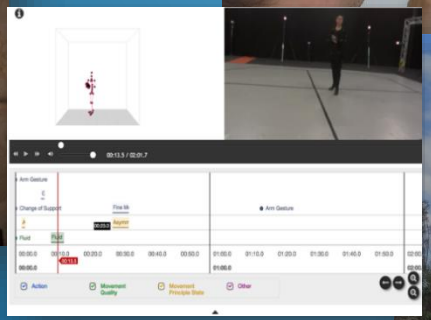
Digital Applications for Culture and the Creative Industries

Embodied interaction for teaching dance



WHOLODANCE

Research and applications for digital cultural heritage

EMOTIVE
Storytelling for cultural heritage
www.emotiveproject.eu

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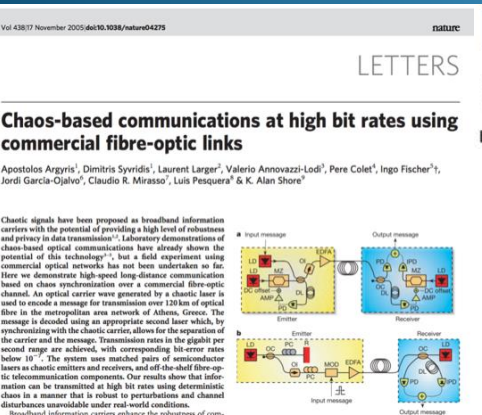
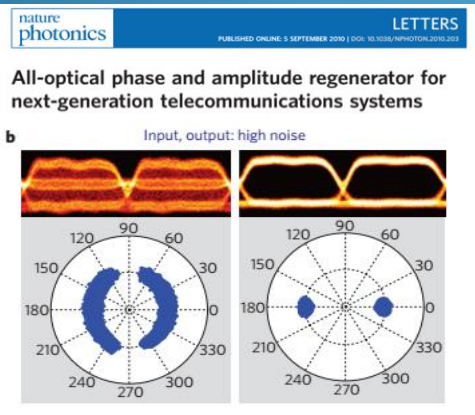
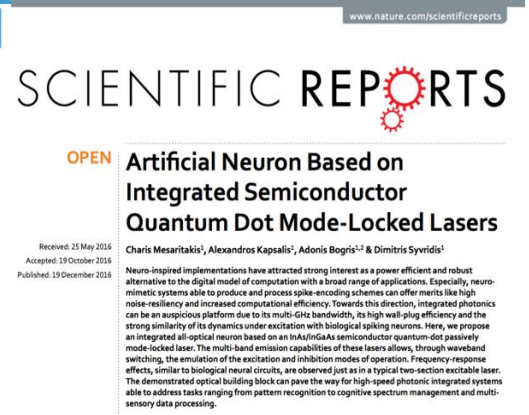
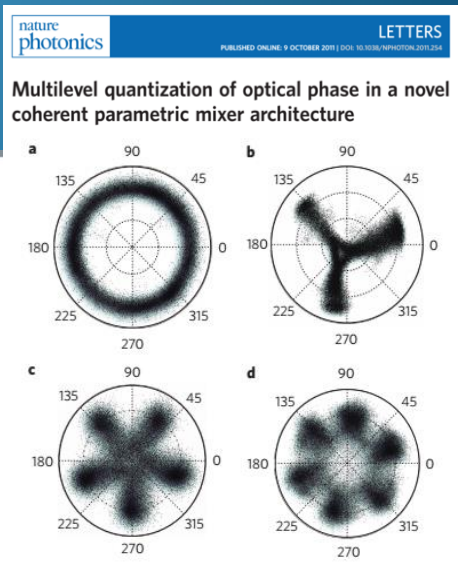
Photonic Technology & Optical Communications

- ✓ **Photonic driven Physical Security**: Photonic Encryption based on Chaotic Laser Pairs, Synchronized Chaotic Laser Networks, Unclonable Secure Optical Cryptosystems (TR35 World's Top Innovators Award, MIT, USA)
- ✓ **Photonic driven Ultra-Fast Communications**: Ultra-High Speed Fiber Optic Communication Systems, Design and experimental evaluation of high performance telecomm components (quantum-dot/ micro-disk emitters)
- ✓ **Photonic Driven Computation & Neuromimitism**: Ultra-Fast Neural Networks based on Photonic Components, Ultra-Fast Real-Time Signal Prognosis, Neuromimetic Photonics based on Quantum-Dots









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Pan-European Robotics Test Fields Network

Mobile IoT Research
Coordinator: ΕΚΠΑ

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Space Technology Designed in Greece

- ✓ **Hardware Accelerator** for **On-Board Image Data Compression** for the ASPIICS Coronagraph System of the ESA PROBA-3 mission
- ✓ Cutting-edge technology high-speed hardware accelerator IP Cores for CCSDS real-time **data and image compression for optical and hyperspectral sensors**, **channel coding for near-earth and deep-space communications** and **authenticated encryption** targeting space-grade FPGAs
- ✓ Collaboration with **AIRBUS** in the development of the next generation **High-Speed Integrated Satellite Data System**

esa
European Space Agency