

ASIMAKIS K. LEROS

Assistant Professor

Department of Information and Communication Systems Engineering

University of the Aegean

CURRICULUM VITAE

January 2019

## PERSONAL INFORMATION

Date of birth: 24 November 1962  
 Home address: Solomou 22, Marousi 15126, Greece  
 Work address: Dept. of Information & Communication Systems Engineering,  
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## EDUCATION

PhD in Computer Engineering University of Patras, Greece	Feb. 1999
M.S. in Electrical and Computer Engineering University of Massachusetts, Amherst, MA	June 1988
Diploma in Electrical Engineering University of Patras, Greece	June 1985

## SCIENTIFIC AREA OF SPECIALIZATION

- Digital signal processing
- Telecommunications
- Statistical detection and estimation theory
- Modelling and simulation of discrete event dynamical systems

### Current research activities

- Development of signal processing algorithms for direction of arrival (DoA) estimation using acoustic sensor arrays
- Traffic modelling in a communications network node using statistical signal processing (Kalman filtering, mean-reverting stochastic processes)
- Modelling and prediction of air travel demand using statistical signal processing algorithms

## EMPLOYMENT HISTORY

### A. Academic

- |                                                                                                        |                       |
|--------------------------------------------------------------------------------------------------------|-----------------------|
| ➤ Department of Information and Communication Systems Engineering,<br>University of the Aegean, Greece |                       |
| <i>Tenured Assistant Professor</i>                                                                     | Feb. 2011 – present   |
| <i>Assistant Professor</i>                                                                             | Aug. 2007 – Feb. 2011 |
| <i>Lecturer</i>                                                                                        | Oct. 1998 – Aug. 2007 |

## Responsibilities:

- Participation in research activities in the areas of signal processing, system identification, target localization and tracking, modelling and simulation, and distance learning
- Teaching various courses in the following areas:
  - Introductory mathematics, probability and statistics
  - Computer science (programming, algorithms, simulation, information systems)
  - Electronics engineering (digital signal processing, telecommunications, networks)
- Supervision of undergraduate and graduate theses and senior projects in various areas of electronics and computer engineering including implementation and evaluation of DSP algorithms, reliability analysis, performance evaluation of computer networks etc.
- Administrative activities including:
  - Participation in the development of the department's first undergraduate curriculum
  - Participation in periodic assessment and modification of the department's undergraduate curriculum as a member of the curriculum committee
  - Departmental responsible for the Erasmus program (mobility of staff and students), and for bilateral agreements for student exchange
  - Departmental responsible for the implementation of the European Credit Transfer System (ECTS)
  - Member of the departmental evaluation committee

- Hellenic Air Force Academy, Dekelia, Greece  
*Adjunct Assistant Professor* Sep. 1998 – Feb. 1999  
 Responsibilities: Teaching a one-semester course on simulation

- Department of Informatics, Technological Educational Institution (TEI) of Athens, Greece  
*Adjunct Assistant Professor* Sep. 1989 – June 1999  
 Sep. 2006 – June 2011  
 Sep. 2017 – present

## Responsibilities:

- Teaching, mainly laboratory courses, in the following areas:
  - Computer architecture, assembly language programming, microcomputers and microcontrollers
  - Signals and systems, telecommunications
  - Computer literacy, introduction to programming languages
- Supervision of senior (last-year) projects in the areas of simulation of various processor architectures, applications of microcontrollers etc.

- Dept. of Electrical and Computer Engineering,  
 University of Massachusetts, Amherst, MA  
*Teaching Assistant* Sep. 1985 – Dec. 1986  
 Responsibilities: Laboratory courses, tutoring

**B. Professional**

- Lambda Technologies and Associates, Athens Nov. 1995 – Sep. 1997  
Responsibilities:
  - Participation in European funded research projects in the area of transport telematics
  - Development software for simulation and reliability analysis of production lines
  - Applications of neural networks
- Impetus Consultants S.A., Athens Sep. 1992 – Nov. 1995  
Responsibilities:
  - Participation in European funded research projects in the area of transport telematics
  - Development of freight and fleet management systems
- Hellenic Air Force Computing Center Apr. 1991 – Dec. 1992  
Responsibilities: Development and maintenance of various applications (compulsory military service)
- InDeCon Ltd, Athens Jan. 1990 – Feb. 1991  
Responsibilities:
  - Participation in European funded research projects in the areas of robotics and automatic control
  - Development of software libraries for scientific computation

**TEACHING EXPERIENCE****A. Courses that I have designed***Computer Literacy* (Univ. of the Aegean, 1998-2000)

A course with emphasis on lab exercises introducing non-computer science majors to word processing, spreadsheets, presentation software and web browsing. The course was based on the European Computer Driver's License (ECDL) standard.

*Microprocessors and Microcontrollers Lab* (TEI-Athens, 1999-2000)

A set of lab exercises based on the Intel 80196 microcontroller design kit and the MCS-96 macro assembler.

*Probability and Statistics* (Univ. of the Aegean, 2000-present)

A first-year course for computer science majors. The course syllabus has been revised several times following the shifting requirements of the department curriculum, and is currently the first part of a two-course module.

*Signals and Systems* (Univ. of the Aegean, 2000-present)

A third-year course with lab, designed for computer science majors rather than electrical/electronics engineers. The emphasis is on Fourier analysis, both in the continuous and discrete case. Lab exercises involve programming in Matlab.

*Digital Signal Processing* (Univ. of the Aegean, 2001-present)

A fourth-year theoretical course. Since it is intended for computer science majors, the course emphasis has shifted from filter design to topics such as FFT algorithms, Kalman filtering, and pattern recognition. Matlab is used extensively in weekly assignments and course projects.

*Information Theory* (Univ. of the Aegean, 2002-2005)

A fourth-year theoretical course introducing entropy, source coding, and error control (block and convolutional codes) to computer science majors. A graduate course covering more advanced coding algorithms evolved out of this course.

*Information Hiding* (Univ. of the Aegean, 2004-2005)

A 6-7 week module, part of the graduate course Network Security II, which covered steganography and watermarking algorithms.

*Performance Evaluation and Simulation* (Univ. of the Aegean, 2007-present)

A fourth-year course covering performance evaluation of computer systems and networks. Both mathematical models (Markov processes and queueing systems) and simulation analysis are covered. The course eventually split into an undergraduate source focusing mostly on simulation, and a graduate course on performance evaluation of networks.

*Digital Communications* (Univ. of the Aegean, 2014-present)

A fourth-year course covering A/D conversion, digital modulation, source coding, and error-control coding. Lab exercises are mainly in Simulink.

**B. Graduate courses that I have taught**

- Information Hiding / Network Security (2 half-semester at the University of the Aegean)
- Information Theory (3 semesters at the University of the Aegean)
- Performance Evaluation of Computer Networks (5 semesters at the University of the Aegean)

**C. Undergraduate courses that I have taught**

- Algorithms and Complexity (2 semesters at the University of the Aegean)
- Computer Literacy (for non-computer science majors, 3 semesters at the University of the Aegean, 2 semesters at the TEI Athens)
- Data Structures (1 semester at the University of the Aegean)
- Digital Communications (3 semesters at the University of the Aegean)
- Digital Signal Processing (12 semesters at the University of the Aegean)
- Discrete Mathematics (8 semesters at the University of the Aegean)
- Information Systems Design and Implementation (1 semester at the University of the Aegean)
- Information Theory (3 semesters at the University of the Aegean)
- Introduction to Programming (for non-computer science majors, 2 semesters at the TEI Athens)
- Performance Evaluation of Computer Systems (5 semesters at the University of the Aegean)

- Probability and Statistics (10 semesters at the University of the Aegean)
- Project Management (1 semester at the University of the Aegean)
- Signals and Systems (12 semesters at the University of the Aegean)
- Simulation (8 semesters at the University of the Aegean, 1 semester at the Hellenic Air Force Academy)
- Stochastic Processes (4 semesters at the University of the Aegean)

**D. Laboratory courses**

- Assembly Language Programming (19 semesters at the TEI Athens, 1 semester at the University of Massachusetts)
- Computer Architecture (3 semesters at the TEI Athens)
- Microprocessors and Microcontrollers (21 semesters at the TEI Athens)
- Operating Systems (1 semester at the University of the Aegean)
- Signals and Systems (4 semesters at the University of the Aegean, 2 semesters at the TEI Athens)
- Telecommunications (6 semesters at the TEI Athens)

**E. Courses taught as a teaching assistant**

- Probability and Statistics (1 semester at the University of Massachusetts)
- Signal Theory (1 semester at the University of Massachusetts)

**F. Course Notes (in Greek)**

- “Assembly Language Programming” (with D. Kehayas), TEI Athens, 1995.
- “Probability and Statistics,” University of the Aegean, 2008.
- “Digital Signal Processing,” University of the Aegean, 2009.
- “Performance Evaluation,” University of the Aegean, 2009.
- “Signals and Systems,” University of the Aegean, 2015.

**G. Other courses that I could teach**

- Image Processing
- Pattern Recognition

**H. Supervision or co-supervision of undergraduate theses**

Approximately 30 diploma theses (one or two-semester senior-year projects) at the TEI Athens, University of Patras and University of the Aegean in various applications of digital signal processing, automatic control, performance evaluation, simulation, and microcontroller applications.

**I. Supervision or co-supervision of PhD dissertations**

- S.S. Pappas, “Order and Parameter Estimation in Time Series Using Multimodel Partitioning,” University of the Aegean, 2008.
- I.K. Giannopoulos, “Traffic Modelling in Computer Networks Using Statistical Signal Processing,” expected to conclude in 2019.
- K. Tsaramirsis, “Signal Processing Algorithms in Virtual Reality Applications,” work in progress.

## **PARTICIPATION IN FUNDED RESEARCH & DEVELOPMENT PROJECTS AND STUDIES**

- “MARIE: Mobile Autonomous Robots for Industrial Environments”, 4 year project, DG XIII ESPRIT II (1989-1992).
- “FOCUS: Front ends for Open and Closed User Systems”, 4 year project, DG XIII ESPRIT II (1989-1992).
- “FRAME: Freight Management in Europe”, 3 year project, DG XIII Transport Telematics (DRIVE II), 1992-1994.
- “CITRA: Corridor Initiative for Transit Route through the Alps”, 3 year project, DG XIII Transport Telematics (1992-1994).
- “EWTIS: European Water Traffic Information System”, 3 year project, DG XIII ENS (1992-1994).
- “ARTIS: Advanced Road Transport Informatics in Spain”, 3 year project, DG XIII Transport Telematics (1992-1994).
- “SAMOVAR: Safety Assessment Monitoring On-Vehicle with Automatic Recording”, 3 year project, DG XIII Transport Telematics (1992-1994).
- “RUNES: Rural Networking for European SMEs”, 3 year project, DG XIII ORA (1992-1994).
- “CORD (Task Force on Evaluation, Working Group on Hazardous Goods Monitoring and Control)”, DG XIII Transport Telematics (1993-1994), 2 year study. Programme: FP3-DRIVE II. Project ID: V2056. Role in the project: Development of guidelines for the assessment of transport telematics applications in the area of monitoring and control of hazardous goods transport.
- “ISSE: Institute for continuing and complementary education”, Greek national 2 year project (1998-1999) funded by the General Secretariat for Research and Development.
- “SENSE: Smart Embedded Network of Sensing Entities”, 3 year IST project (2006-2007).
- ACRITAS (Advanced Coordination Center Information Technologies & Applications for Border Security), 2 year national project funded by the Greek Ministry of the Interior / Center for Security Studies (2014-2015).
- “Understanding diversity in Rhodes,” European Economic Area Grant GR07/3635, Dec. 2015 – Aug. 2016.

## **FOREIGN LANGUAGES**

- English (fluent)
- Spanish (fair)

## **MEMBERSHIPS**

Member, IEEE (Signal Processing, Automatic Control Societies)

## PUBLICATIONS

### A. Dissertation

- [1] A.K. Leros, *Adaptive Estimation Algorithms for Passive Target Tracking* (in Greek). Doctoral dissertation, Dept. of Computer Engineering and Informatics, University of Patras, Greece, 1998.

### B. Book chapters

- [1] N.V. Nikitakos, A.K. Leros, and S.K. Katsikas, "On the dynamic motion of a towed array in the ocean," in *Recent Advances in Information Science and Technology*, N. E. Mastorakis (Ed.), World Scientific Publ., pp. 257 - 263, 1998.

### C. Peer-reviewed journals

- [1] S.K. Katsikas, A.K. Leros, and D.G. Lainiotis, "Passive tracking of a maneuvering target: An adaptive approach," *IEEE Transactions on Signal Processing*, vol. 42, no. 7, pp. 1820-1825, July 1994.
- [2] S.K. Katsikas, A.K. Leros, and D.G. Lainiotis, "Underwater tracking of a maneuvering target using time delay measurements," *Signal Processing (Elsevier)*, vol. 41, no. 1, pp. 17-29, Jan. 1995.
- [3] N.V. Nikitakos, A.K. Leros, and S.K. Katsikas, "Towed array shape estimation using multimodel partitioning filters," *IEEE Journal of Oceanic Engineering*, vol. 23, no. 4, pp. 380-384, Oct. 1998.
- [4] S.S. Pappas, A.K. Leros, and S.K. Katsikas, "Joint order and parameter estimation of multivariate autoregressive models using multi-model partitioning theory," *Digital Signal Processing (Elsevier)*, vol. 16, no. 6, pp. 782-795, Nov. 2006.
- [5] A.K. Leros and V.C. Moussas, "Performance analysis of an adaptive algorithm for DOA estimation," *IAENG International Journal of Computer Science* vol. 38, no. 3, pp. 309-313, 2011. Enhanced version of conference article [D16].
- [6] I.K. Giannopoulos, A.P. Leros, A.K. Leros and G. Tsaramirsis, "A stochastic model with an adaptive proportional controller for the evolution of user-router bandwidth demand for quality of service (QoS) aspects," *Ad Hoc & Sensor Wireless Networks*, vol. 30, pp. 65-81, 2016.

### D. Peer-reviewed conference proceedings

- [1] S.K. Katsikas, A.K. Leros, and D.G. Lainiotis, "Passive tracking of a maneuvering target: An adaptive approach," in *Proc. 5th European Signal Processing Conference (EUSIPCO 90)*, Barcelona, Spain, Sep. 1990, vol. 3, pp. 1887-1890.



- [2] A.K. Leros, N.V. Nikitakos, and S.K. Katsikas, "An adaptive technique for towed array shape estimation," in *Proc. 3rd European Conference on Underwater Acoustics*, Heraklion, Greece, June 1996, vol. 2, pp. 1043-1048.
- [3] N.V. Nikitakos, A.K. Leros, and S.K. Katsikas, "Multiple source localization using partitioning algorithms," in *Proc. IEEE Oceans '98 Conference*, Nice, France, Sep. 1998, vol. 3, pp. 1418-1421.
- [4] A.K. Leros and S.K. Katsikas, "Adaptive tracking of a maneuvering target by a towed array using multimodel partitioning algorithms," in *Proc. 5th International Conference on Information Systems Analysis and Synthesis (ISAS '99)*, Orlando, FL, July 1999, Vol. VI, pp.500-507.
- [5] A.K. Leros, "Estimation of a discontinuous bias term in linear systems," in *Proc. 1st International Conference on Scientific Computing and Computational Engineering (1st IC-SCCE)*, Athens, Greece, June 2004.
- [6] S.K. Katsikas, S.D. Likothanassis, A.K. Leros, and V.C. Moussas, "An adaptive algorithm for multiple source detection," in *Proc. 1st International Conference on Scientific Computing and Computational Engineering (1st IC-SCCE)*, Athens, Greece, June 2004.
- [7] A. Platis, C. Lambrinoudakis, and A.K. Leros, "A probabilistic model for evaluating the operational cost of PKI-based financial transactions," presented at the *1st European PKI Workshop (EuroPKI 2004)*, Samos, Greece, June 2004. Published in *Springer Lecture Notes in Computer Science "Public Key Infrastructure"*, S.K. Katsikas, S. Gritzalis, and J. Lopez (Eds.), vol. LNCS 3093, pp. 149-159.
- [8] V.C. Moussas, S.D. Likothanassis, S.K. Katsikas, and A.K. Leros, "Adaptive on-line multiple source detection," in *Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2005)*, Philadelphia, PA, March 2005, vol. IV, pp. 1029-1032.
- [9] C. Lambrinoudakis, A. Platis, and A.K. Leros, "A PKI security reliability assessment methodology," in *Proc. European Safety & Reliability Conference (ESREL 2005)*, Gdynia, Poland, June 2005, vol. II, pp. 1229-1234.
- [10] S.S. Pappas, A.K. Leros, and S.K. Katsikas, "Multivariate AR model order identification using partitioning theory," in *Proc. IEEE/EURASIP 12th Int. Workshop on Systems, Signals and Image Processing*, Chalkis, Greece, Sep. 2005, pp. 51-55.
- [11] S.S. Pappas, A.K. Leros, and S.K. Katsikas, "Multivariate AR model order estimation with unknown process order," presented at the *10th Panhellenic Conference on Informatics (PCI 2005)*, Volos, Greece, Nov. 2005. Published in *Springer Lecture Notes in Computer Science "Advances in Informatics"*, P. Bozanis and E.N. Houstis (Eds.), vol. LNCS 3746, pp. 787-797.

- [12] V.C. Moussas and A.K. Leros, "Design of a multiple model simulation test-bed for a common-based comparison of tracking filters", in *Proc. 2nd International Conference on Experiments, Process, System Modelling, Simulation and Optimization (EpsMsO)*, Athens, Greece, 4-7 July, 2007.
- [13] V.C. Moussas, A.K. Leros, and S.K. Katsikas, "Adaptive DOA source location using acoustic sensor arrays," in *Proc. 3rd International Conference on Scientific Computing and Computational Engineering (3rd IC-SCCE)*, Athens, Greece, July 2008.
- [14] A.K. Leros, "Estimation of a discontinuous bias term in linear systems," in *Proc. IASTED 12th International Conference on Intelligent Systems and Control (ISC 2009)*, Cambridge, MA, November 2009, pp. 252-259.
- [15] A.K. Leros and V.C. Moussas, "Performance analysis of an adaptive algorithm for DOA estimation," presented at the *2011 International Conference of Signal and Image Engineering (ICSIE 2011)*, Imperial College, London, U.K., July 6-8, 2011.
- [16] A.K. Leros and V.C. Moussas, "Performance of the MMPF algorithm for DOA estimation under sensor failures," in *Proc. IASTED 13th International Conference on Intelligent Systems and Control (ISC 2011)*, Cambridge, U.K., July 2011.
- [17] I.K. Giannopoulos, A.K. Leros, and A.P. Leros, "Qualitative assessment of traffic in computer networks", presented at the *MIC-Telecom 2013*, Barcelona, Spain, December 20-22, 2013.
- [18] I.K. Giannopoulos, A.K. Leros, and A.P. Leros, "A model for the evolution of router bandwidth demand using an adaptive PID controller," presented at the *2015 International Conference of Signal and Image Engineering (ICSIE 2015)*, Imperial College, London, U.K., July 1-3, 2015. Published in the *IAENG Lecture Notes in Engineering and Computer Science – Proc. of the 2015 World Congress in Engineering*, vol. I, pp. 547-551.

#### **E. Other scientific and technical publications**

- [1] N.V. Nikitakos, A.K. Leros, and S.K. Katsikas, "On the dynamic motion of a towed array in the ocean," in *Proc. 2nd IMACS International Conference on Circuits, Systems and Computers (CSC '98)*, Piraeus, Greece, Oct. 1998, vol. 1, pp. 310-316.
- [2] N.V. Nikitakos, A.K. Leros and S.K. Katsikas, "Target estimation using multimodel partitioning techniques," in *Proc. 5th WSES International Conference on Circuits, Systems, Communications and Computers (CSCC 2000)*, Rethymno, Greece, July 2000, pp. 7131-7135.
- [3] A.P. and A.K. Leros (Eds.), "Guidelines for the Assessment of Transport Telematics in Hazardous Goods Management and Control," final report of the

Task Force on Evaluation of Transport Telematics Applications, vol. 5 of Deliverable ACO7, July 1994.

## **AWARDS**

Best Paper Award: 2015 International Conference of Signal and Image Engineering (ICSIE 2015) organized by the International Association of Engineers (IAEng) – paper [D18] above.