

CURRICULUM VITAE

Dr. Ing. Prof. KIMON P. VALAVANIS

Fellow, AAAS

PROFESSOR AND CHAIR

and

PROFESSOR AND INTERIM CHAIR

Electrical & Computer Engineering

Computer Science

School of Engineering & Computer Science (SECS)

SECS

University of Denver (DU)

DU

Clarence M. Knudson Hall, Room 300

John Greene Hall, 116

Denver, CO 80208-1500

Denver, CO 80208-4310

Phone/Fax: (303) 871-2586 / (303) 871-2194

(303) 871-2283 / (303) 871-3010

kimon.valavanis@du.edu, kvalavan@du.edu

kvalavan@cs.du.edu

<http://www.ece.du.edu/kvalavanis>

KS&P Technologies

President and CEO

president@ksp-technologies.com

www.ksp-technologies.com

Personal Information :

Citizenship: US Citizen, and Native of Greece

Home Address:

The Boulevard, 150 W, 9th Avenue, Unit 3411

Denver, CO 80204

E-mail: kvalavanis@gmail.com

CAREER OBJECTIVES

To seek challenging positions in the Computer and Systems Engineering domain that require educational, research and development, leadership, entrepreneurial, organizational and managerial skills. To lead and enhance University Departments and Colleges, research and development centers, and develop interdisciplinary programs emphasizing research cooperation and collaboration between academe, government and industry, facilitating technology transfer from the laboratories to the market. To seek challenging research and management positions in nationally/internationally recognized industrial/federal research and development centers. To establish high-tech startup companies to develop and market novel and cost-effective solutions for unmanned systems applications, and automation. To create successful start-up companies and commercialize high technology laboratory prototypes.

Curriculum Vitae Outline

PART I: Career Summary - Professional and Administrative Experience
PART II: Research Publications and Experience
PART III: Funding Record
PART IV: Academic and Teaching Experience
PART V: Professional Activities

Last Updated, November 2010

Kimón P. Valavanís, Vitae

PART I

EDUCATION

- **Rensselaer Polytechnic Institute (RPI)** Troy, NY
PhD, Computer and Systems Engineering, 1986.
M.Sc., Electrical Engineering, 1984.
- **National Technical University of Athens (NTUA)** Greece
Diploma in Electrical Engineering (5 years of study); minor in Electronic Engineering and Electric Power Systems, 1981.
- **Registered Electrical/Mechanical Engineer (PE)**, Technical Chamber of Greece (March 1982).
- **Languages:** English, French, Greek (native).

RESEARCH INTERESTS

Renewable Energy Systems

- Solar and Wind Energy Systems;
- Smart Grid; integration, monitoring, diagnostics, security;

Unmanned Systems

- Unmanned Aircraft Systems (UAS) integration into the National Airspace System (NAS): safety levels, risk analysis, reliability assessment, classification and certification procedures;
- Information/sensor fusion, sensor based control of UAS, Autonomous Underwater Vehicles (AUVs), Unmanned Ground Vehicles (UGVs);
- Guidance, navigation, control and collision avoidance of unmanned systems;
- Parameter identification, estimation, modeling, control of small scale unmanned rotorcraft;
- Integrated Control & Diagnostics; Hardware/Software -in-the-loop verification and validation;
- Swarm Formation Control and coordination of UGVs, UAS and UGV-UAS teams;
- UGV-based take off/landing platforms for unmanned helicopter launch and recovery on the move;
- FPGA-based autopilot/microcontroller designs, across unmanned platforms suitable;
- Integrating and prototyping multi-mission/special purpose unmanned helicopters;
- Energy / power optimization for unmanned systems.

Distributed Intelligence Systems

- Mathematical modeling, control and coordination, integrated control and diagnostics, computational complexity, decision making, performance evaluation of distributed / robotic systems and random topology and complexity production systems;
- Control, coordination and performance evaluation of network controlled distributed systems;
- Petri Net / Hybrid Petri Net / Modular Petri Net Theory and Applications;
- Generalized System Theory.

Applications

- Networks and Telecommunication Systems; Wireless Sensor Networks;
- Discrete Event Dynamic Systems, FMS, CIM Systems, Power Systems;
- C⁴I system performance evaluation;
- Manufacturing agility metrics and performance evaluation;
- Distributed networked virtual reality and multimedia applications for multi-user environments (functional-, interconnection-, agent- based models, QoS evaluation);
- Machine Vision (color image enhancement, noise removal, segmentation, classification);
- Unmanned vehicle based traffic monitoring and emergency response;
- Modeling, analysis and prediction of traffic patterns based on statistical profiles derived from UAS-based real-time video data;
- Sensor based navigation of skid steering mobile robots;
- Cooperation and coordination of robots treated as mobile, autonomous agents;

- Virtual environment based modeling, control and simulation of robotic manipulators, mobile robots, UAS, AUV, UGV, and CIM systems.

HONORS & AWARDS

- Fellow, AAAS:** Elected Fellow of the *American Association for the Advancement of Science* in November of 2009.
- Fulbright Scholar:** *Senior Lecturing & Research Award* (2001), Faculty of Electrical Engineering and Computing, Department of Telecommunications, University of Zagreb, Croatia.
- July 1998 – 2003:** *Distinguished Lecturer*, IEEE Robotics and Automation Society.
- Since November 1995:** *Life Member, Upsilon Pi Epsilon (YPIE) - the International Honor Society for the Computing Sciences.*
- 1994 – 08/2000:** *A-CIM/[TC]²/BORSF Regents Professor in Manufacturing*, University of Louisiana at Lafayette (UL at Lafayette), USA.
- 1987-1990:** *Analog Devices Career Development Chair for Assistant Professors*, Dept. of Electrical and Computer Engineering, Northeastern University, Boston.

Biography Listings

- Marquis *Who's Who in the Media and Communications*, 1st Edition, New Providence, NJ07974.
- Marquis *Who's Who in the World*, 12th Edition, New Providence, NJ 07974.
- Marquis *Who's Who in America*, 48th Edition, New Providence, NJ 07974.
- *Dictionary of International Biography*, 23rd Edition, International Biographical Centre, Cambridge CB2, 3QP, England.
- Marquis *Who's Who in Science and Engineering*, 2nd Edition, Reed Reference Publishing, Wilmette, Illinois 60091.
- *Men of Achievement*, 16th Edition, International Biographical Centre, Cambridge CB2, 3QP, England.

PATENTS

- **Provisional Patent through DU:** “*Intelligent Self-Leveling Nodal and Docking System*”, EFS ID: 8798032, Application Number: 61411635, International Application Number: N/A, Confirmation Number: 1639.
- **In Greece:** “*Design of Autonomous Navigation System for UAVs*”; Patent number 1004873, International Classification G01C 21/34, G08G 5/04. Approved: April 2005. [Complete system with a PCB board, controller, interfaces, microprocessors, converters, sensors, for plug-in, -out missions.]

PROFESSIONAL EXPERIENCE

GUEST/ADJUNCT/SABBATICAL/VISITING PROFESSOR POSITIONS

- May-June '04:** *Visiting Professor; European Union PhD Research Program in Italy;* Dipartimento di Ingegneria Informatica, Gestionale e dell' Automazione, Università Politecnica delle Marche, Ancona, Italy.
- Sabbatical, '03:** *Visiting Professor,* Computer Science and Engineering, Center for Robot Assisted Search and Rescue, University of South Florida, Tampa, FL.
- Since 12/1997:** *Guest Professor,* Faculty of Electrical Engineering and Computing, Department of Telecommunications, University of Zagreb, Croatia.

FACULTY & ADMINISTRATIVE POSITIONS

- Since 7/1/2009:* Professor and Interim Chair, Department of Computer Science, University of Denver.
- Since 9/1/2008:* Professor and Chair, Department of Electrical and Computer Engineering, University of Denver.
- Dean's Strategic Planning Committee
 - Dean's New SECS Building Committee
 - Director, *DU Unmanned Systems Laboratory, (DU²SL)*
 - Graduate Program Coordinator
- 8/2003-8/2008:* Professor, Computer Science and Engineering, University of South Florida.
- Director, *Unmanned Systems Laboratory*, 2006 – August 2008.
 - Faculty Associate, Center for Urban Transportation Research (CUTR).
 - Faculty Associate, Clean Energy Research Center (CERC).
 - Managing Director, National Institute for Applied Computational Intelligence (NIACI), 2006-May 2008.
 - Deputy Director, *Center for Robot Assisted Search and Rescue (CRASAR)*, August 2003 - summer 2005.
- 1999-2003:* Professor, Director, Laboratory of Intelligent Systems and Robotics, Department of Production Engineering & Management, Technical University of Crete, Chania, Greece.
- Director, *Graduate Studies*, Department of Production Engineering & Management, Technical University of Crete.
 - Chair, University Technical Council, Technical University of Crete.
- July 1995 – 1999:* Professor and Graduate Faculty of Computer Engineering, Center for Advanced Computer Studies (CACCS), UL at Lafayette.
- 1995 – 1998:* Associate Director for Research, Apparel-Computer Integrated Manufacturing Center, UL at Lafayette.
- 1993 –10/1995:* Associate Director for Research in Robotics and Automation, Apparel Computer Integrated Manufacturing Center, UL at Lafayette.
- 1991 – 1995:* Associate Professor and Graduate Faculty of Computer Engineering, Center for Advanced Computer Studies (CACCS), UL at Lafayette.
- 1986 – 1990:* Assistant Professor and Director, Robotics Laboratory, Department of Electrical and Computer Engineering, Northeastern University.
- 1987 – 1990:* National Technological University (NTU) Instructor (through the Northeastern University TV network), Boulder, Colorado.
- 1982 – 1985:* Research Associate and Teaching Assistant at the Robotics and Automation Laboratory, Department of Electrical, Computer, and Systems Engineering, Rensselaer Polytechnic Institute, Troy NY.
- 1975 – 1981:* Instructor, Learning Centers, Athens, Greece.

EXECUTIVE BOARD & MEMBER POSITIONS

- **2010:** Member, AHEPA, Denver Chapter.
- **2004 – 3/2006:** Managing Director, “American Foundation for Greek Language and Culture”, AFGLC, Tampa Office; <http://www.afglc.org>.

TECHNICAL AND CONSULTING EXPERIENCE

- **5/2010:** Founder, President and CEO of *KS&P Technologies, LLC*, www.ksp-technologies.com, a High-Tech startup company focusing developing cutting edge technologies in robotics and automation.

- **9/2007-12/2008:** Co-Founder, Managing Member and CTO of *Archytas Unmanned Systems, LLC* (<http://www.archytasus.com>).
- **March 2003 – March 2006:** Founder of a research consortium (from SBIR) to design and develop integrated controllers for autonomous navigation of unmanned vehicles. Responsible for technical agenda, technology transfer, intellectual rights, business plan. (Initial funding received from EU/Greek Secretariat for Research and Technology -GSRT).
- **1999 – 2003:** Consultant for EADS - 3SIGMA S. A. (former STN ATLAS-3SIGMA S. A.) Responsible for R&D division set up, management and activities coordination, new project initiatives and funding. Leader, company–TUC projects management. Duties included enhancing autonomous UAV performance, new VTOL design specifications and development, UAV jet engine design for enhanced performance. (**E**uropean **A**eronautics, **D**efense and **S**pace Company – EADS).
 - Participant with EADS - 3SIGMA S. A. in the WEAG (**W**estern **E**urope **A**rmament **G**roup) meetings for establishing civilian UAV specifications.
 - Participant with EADS - 3SIGMA S. A. and speaker in the EURO UVS (**U**nmanne**D** **V**ehicle **S**ystems).
- **1997-2001:** Consultant, Ericsson - Nikola Tesla, Croatia, (through the University of Zagreb). Networked virtual reality environments, simulation, and QoS specifications.
- **1987-1989:** Consultant and co-founder, GNOSITEK INC., Boston, MA: Consulting in design of robotic and automation systems; Development of total solution robotic systems for specific applications (package handling, distribution, palletizing); Robot market analysis; New product development and marketing.
- **1981- Present:** Consultant of Private Companies, Athens, Greece: Consulting in manufacturing systems, automation, robotics, technology transfer, production planning and management, start-up companies and economic development.

UNIVERSITY AND DEPARTMENT ADMINISTRATIVE EXPERIENCE

UNIVERSITY OF DENVER

UNIVERSITY COMMITTEES

- *Member*, University committee to establish policies for admitting graduate students who have completed three-year undergraduate degrees (as per the *Bologna Agreement*).

CS DEPARTMENT

- *Since 7/1/2009* – Interim Chair. Focusing on:
 - Evaluating CS department current status, reviewing degrees, programs and research focus areas.
 - Close collaboration with the CS Industrial Advisory Board (IAB) to enhance undergraduate/graduate curricula to reflect and account for recent changes and advancements in the field.
 - Establishing common course thematic sequence courses between CS and Computer Engineering (CpE).
 - Promoting multidisciplinary/interdisciplinary research initiatives to attract funding.
 - Recruitment of good quality students.

ECE DEPARTMENT

- *Since 9/1/2008* – *Chair*
 - ✚ Completed successfully ABET in October of 2010. Positive observations/comments on the strengths of the undergraduate common curriculum (enhanced) the Mechatronic Systems Engineering (MSE) concentration (new) and the collaboration between CS and CpE.
 - ✚ Created a new undergraduate program in MSE; it is a concentration leading to a BSEE-MSE degree.

- ✚ Established a new PhD program in Mechatronic Systems Engineering (MSE), which started on September 1, 2010. (Note: DU is the only University in the U.S. that offers BS, M.Sc, and PhD degrees in MSE!)
- ✚ Established a PhD in ECE, effective September 1, 2010.
- ✚ Completed enhancements in undergraduate curricula to include courses in Business Law, Engineering Entrepreneurship, Technology Transfer, Patents & IP Rights, and Ethics throughout the curriculum.
- ✚ Created a new focus area in Electric Power and Energy Systems at the undergraduate and graduate levels focusing on renewable energy systems, sustainability, SmartGrid optimization and security.
- ✚ Evaluated all PhD degree programs and recommended changes to the Qualifying Exams to reflect breadth/ depth of knowledge in core, two area-specific and research specialization areas.
- ✚ Created and established the undergraduate Control Systems Laboratory (for educational purposes, coupled with teaching analog, digital and adaptive control), and the Unmanned Systems Laboratory (for research purposes).
- ✚ Improved computational facilities within ECE.
- ✚ Initiated closer collaboration with the Industrial Advisory Board (IAB) members and industry.
- ✚ Coordinating multidisciplinary/interdisciplinary research initiatives between Universities.
- ✚ Research funding increased 400% in one year, from \$600K to almost \$2.5M. Number of submitted proposals also increased accordingly.
- ✚ Graduate student numbers increased by 45% in one year.
- ✚ **DU²SL**: Supervising a team of 10 PhD students and 5 undergraduate students.

UNIVERSITY OF SOUTH FLORIDA (SEPTEMBER 2003 – AUGUST 2008)

College of Engineering

- *August 2004-2008*: Member, University Research Misconduct Committee (College of Engineering, COE, representative).
- *August 2004-2007*: Member, University Research Council – Representative, COE.

Department of Computer Science and Engineering

- Director, Unmanned Systems Laboratory, 2006 – August 2008;
- Managing Director, National Institute for Applied Computational Intelligence;
- Deputy Director, CRASAR (and chief financial officer summer 2003 - summer 2005);
 - Responsible for project management, research agenda development, human resources management, raising sustainable funding, budget allocation and related issues, acting as the liaison person to industry, Local, State and Federal authorities. Number of employees – on average – 20 PhD candidate students, 5 undergraduate students, 10 affiliated faculty members, two Visiting Faculty / Researchers, 2 Research Scientists.
- Chair, Infrastructure Committee, 2007 – 2008;
- Chair, Faculty Evaluation Committee, 2005-2007;
- Chair, Awards Committee, 2004-2005;
- Member, Faculty Search Committee, 2004-2005;
- Member, CSE Infrastructure Committee, 2003-2004, 2005-2007;
- Member, CSE Graduate Studies Committee, 2003-2004;
- Member, Tenure and Promotion (T&P) Committee, 2003-2008.

TECHNICAL UNIVERSITY OF CRETE (1999-AUGUST 2003)

- Chair, University Technical Council (the council that coordinates, approves and monitors campus-building improvements, new buildings, university property investments, etc., in

cooperation with the City authorities, Ministry of Education, and reports to the University Senate).

- Director, Department Graduate Studies (responsible for the modernization and improvement of the graduate studies in view of the new rules and regulations imposed by the European Union). Developed and introduced an enhanced graduate curriculum that became effective in the 2002-2003 Academic Year.
- Member, Curriculum Development Committee
- Chair and Member, Tenure and Promotion (T&P) Committee.
- Member of Greek Universities T&P committees (external evaluator).
- Member of hiring recommendations and evaluation committee.

UNIVERSITY OF LOUISIANA AT LAFAYETTE (1990-1998)

- Member CACS Governing Board (1997-1998).
- Chair, CACS Research Committee (1997-98).
- Member, Faculty Senate (1995 - 1998).
- A-CIM Associate Director for Research (1995-1998). Responsible for funding, projects management and coordination, liaison between University, Industry Federal and State Government (10 affiliated faculty members, 5 Research / Visiting Scientists, 20 graduate students, 1 technician, staff of 5).
- Member, University Academic Research Council (1996 -1997) – committee that recommended new potential research opportunities as well as key directions for overall University enhancement.
- Chair, Faculty Search Committee (1995 -97).
- Member, CACS Executive Committee (1995 - 97).
- Chair, CACS Ph.D. Qualifying Exams Committee (1992 -1996).

PROFESSIONAL SOCIETIES ADMINISTRATIVE EXPERIENCE

2008: Created the *International Symposium on Unmanned Aerial Vehicles*, an annual conference with industrial, private sector, federal and state government, and university participation. The meeting has been renamed *International Conference on Unmanned Aircraft Systems (ICUAS)*, <http://www.uasconferences.com>. Springer has become Sponsor of ICUAS publishing a special Volume per year since 2008.

Since August 2006: **Journal of Intelligent and Robotic Systems (published by Springer)**
Editor-in-Chief: Reorganized the journal: proposed enhanced scope to include Unmanned Systems; organized Journal after IEEE Transactions publications and Automatica; introduced new editorial board, introduced editorials, educational papers, emphasizing special issues; increased the number of issues from 12 to 16 per year, published in four volumes;

2006-12/2008 **IEEE Systems, Man and Cybernetics (SMC) Society**
Editor-in-Chief, IEEE SMC eNewsletter: responsible for editing, material collection, and layout, production and dissemination. Working with the SMC Board of Governors and Executive / Technical Committees.

2006-2010: **IEEE Robotics and Automation Society (RAS)**
Co-Chair/Chair (2009) of the Aerial Robotics and Unmanned Aerial Vehicles Technical Committee.

2005-2009: *Member,* IEEE Robotics and Automation Society Awards Committee.

1996-12/2005: *Member,* Financial Activities Board.

Member, Publications Committee.

- Editor-in-chief*, IEEE RAS Magazine (two consecutive 5-year terms; stepped down, December 31, 2005).
- 2003:** *Member*, committee to create the new IEEE Transactions on Automation Sciences and Engineering (T-ASE).
- Since 1998:** **Mediterranean Control Association (MCA)**
Vice President, Administration
Member, MCA Board
Member, MCA conference steering committee

NATIONAL – INTERNATIONAL PANELS & COMMITTEES

- **2011:** *European Union Invitation* to be an evaluator of IP and STREP projects in Brussels in March of 2011.
- **2010:** *European Union*: Evaluator of IP and STREP projects, *7th European Union (EU) Framework Programme for research and technology development (FP7) – Information and Communication Technologies (ICT-2009.2.1 Cognitive Systems and Robotics)*, Brussels. Member of the Hearing Committee panel, Luxemburg.
- **2010:** NSF evaluator and panelist, Expedition in Computing Program, April 5-7, 2010.
- **2009:** *European Union*: Evaluator of IP projects, *7th European Union (EU) Framework Programme for research and technology development (FP7) – Information and Communication Technologies (ICT-2009.2.1 Cognitive Systems and Robotics)*, Brussels.
- **2006:** Appointed as *Scientific Project Reviewer* in the research evaluation process, financed by the *Ministry of Science, Education and Sports of the Republic of Croatia*.
- **2001-2002:** (*In Greece*) *National Committee* for the evaluation of Greek University Engineering Programs. *Member*, evaluation committee of Greek Secretariat of Research and Technology (GSRT).
- **1999:** NSF evaluator and panelist (SBIR/STTR) on Sensing and Control, Division of Design and Manufacturing, Directorate of Engineering.
- **1994-1997:** *Member* (through the University of Louisiana A-CIM Center) of the *Defense Logistics Agency* of the Department of Defense (DLA / DOD) *Apparel Research Network (ARN)*.
- **1994-1997:** *Committee Member*, DLA / DOD, *ARN Pre-production and Production Focus Group (PPFG)*. Objective: Develop a national road map for research projects relevant to the DLA ARN mission.
- **1992:** NSF panel in Instrumentation for Research in Computer, Information Science and Engineering, Division of Cross Disciplinary Activities in the CISE Directorate, Washington D.C.

PART II

RESEARCH PUBLICATIONS

BOOKS AND EDITED BOOKS

1. K. P. Valavanis, G. J. Vachtsevanos (Editors), Handbook of Unmanned Aerial Vehicles (UAVs), with emphasis on: UAV History and Fundamentals, UAV Technologies, UAV Integration into the National Airspace, Applications, Who is who in UAVs, Future Trends, Springer (to be published in 2012).
2. K. Dalamagkidis, K. P. Valavanis, L. A. Piegl, On Integrating Unmanned Aircraft Systems in to the National Airspace System: Issues, Challenges, Operational Restrictions, Certification, and Recommendations, Second Edition (to be published by Springer in 2011).
3. K. P. Valavanis (Editor), Unmanned Aerial Vehicles, Selected Papers from the 3rd UAV Symposium held in Dubai, June 2010 (in print, to be published in early 2011).
4. I. A. Raptis, K. P. Valavanis, Linear and Nonlinear Control of Small-Scale Unmanned Helicopters, International Series on Intelligent Systems, Control and Automation: Science and Engineering, Volume 45, Springer 2011.
5. K. P. Valavanis, R. Beard, P. Oh, A. Ollero, L. Piegl, H. D. Shim, Editors, Unmanned Aircraft Systems – 2nd International Symposium on Unmanned Aerial Vehicles, UAV'09, Springer, 2010.
6. K. P. Valavanis (Editor), Applications of Intelligent Control to Engineering Systems, International Series on Intelligent Systems, Control and Automation: Science and Engineering, Volume 39, Springer, 2009.
7. K. P. Valavanis, P. Oh, L. A. Piegl, Editors, Unmanned Aircraft Systems - International Symposium on Unmanned Aerial Vehicles, UAV'08, Springer, 2009.
8. K. Dalamagkidis, K. P. Valavanis, L. A. Piegl, On Integrating Unmanned Aircraft Systems in to the National Airspace System: Issues, Challenges, Operational Restrictions, Certification, and Recommendations, International Series on Intelligent Systems, Control and Automation: Science and Engineering, Volume 36, Springer, 2009.
9. G. Atsalakis, K. Valavanis, K. Zopounidis, Stock Market Forecasting Techniques (in Greek), Klidarithmos (ISBN 978-960-461-121-8), 2008.
10. K. P. Valavanis (Editor), Advances in Unmanned Aerial Vehicles: State of the Art and the Road to Autonomy, International Series on Intelligent Systems, Control and Automation: Science and Engineering, Volume 33, Springer, 2007.
11. J. Balic, K. P. Valavanis, N. C. Tsourveloudis, E. Ioannidis, Intelligent Manufacturing Systems: Programming and Control, University of Maribor Publications, 2003.
12. B. Siciliano, K. P. Valavanis (Editors), Control Problems in Robotics and Automation, Lecture Notes in Control and Information Sciences, Vol. 230, Springer-Verlag, 1998.
13. K. P. Valavanis, G. N. Saridis, Intelligent Robotic Systems: Theory, Design and Applications, Kluwer Academic Publishers, 1992.

Ph.D. Thesis: K. P. Valavanis, A Mathematical Formulation for the Analytical Design of Intelligent Machines, RPI, 1986.

M.Sc. Thesis: K. P. Valavanis, On the Real-time Control of a VAX-11/750 Computer Controlled PUMA-600 Robot Arm, RPI, 1984.

Diploma Thesis: K. P. Valavanis, Protection of Electric Power Transmission Lines with Digital Relays: An Algorithm for Short Circuit Detection, Identification and Isolation, National Technical University of Athens, 1981. (In Greek)

EDITED CONFERENCE PROCEEDINGS

1. K. P. Valavanis, P. J. Antsaklis, Z. Kovacic, K. J. Kyriakopoulos, Proceedings of the 15th Mediterranean Conference on Control and Automation, (CD-ROM and Book of Abstracts), June 2007.
2. K. P. Valavanis, F. Lewis, S. Bogdan, K. J. Kyriakopoulos, Proceedings of the 11th Mediterranean Conference on Control and Automation, (CD-ROM and Book of Abstracts), June 2003.
3. K. P. Valavanis, D. Gracanin, M. Matijasevic, R. Kolluru, Proceedings of the 1st International Advanced Robotics Programme Workshop on Autonomous Underwater Vehicles for Shallow Water and Coastal Environments, University of Louisiana at Lafayette, April 1998.
4. K. P. Valavanis, F. L. Lewis, K. S. Barber, C. Abdallah, Proceedings of the 10th IEEE International Symposium on Intelligent Controls, Monterey, CA, IEEE Control Systems Society Press, August 1995.
5. K. P. Valavanis, G. N. Saridis, A. Pascoal, P. Lima, F. L. Pereira, Proceedings of the International Program Development in Undersea Robotics and Intelligent Control (URIC): A Joint U.S./Portugal Workshop, University of Louisiana at Lafayette, May 1995.
6. K. P. Valavanis, G. N. Saridis, F. Lewis, G. Stavrakakis, N. Koussoulas, K. Kyriakopoulos (Editors), Proceedings of the 2nd IEEE Mediterranean Symposium on New Directions in Control and Automation, Chania, Crete, June 1994.
7. M. A. Bayoumi, L. Davis, K. P. Valavanis (Editors), Proceedings of the Workshop on Computer Architectures for Machine Perception (CAMP'93), IEEE Computer Society Press, December 1993.
8. A. C. Sanderson, A. A. Desrochers, K. Valavanis (Editors), Proceedings Fourth IEEE International Symposium on Intelligent Controls, IEEE Computer Society Press, September 1989.

BOOK CHAPTERS

1. G. Atsalakis, K. P. Valavanis, C. Zopounidis, D. Nezis, “*Time Series Based House Sale Value Market Forecasting Using Genetically Evolved Neural Networks*”, in J. Wang and S. Wang (Editors) Business Intelligence in Economic Forecasting: Technologies and Techniques, pp: 265-282, Information Science Reference, 2010.
2. R. Garcia, L. Barnes, K. P. Valavanis, *Design of a Hardware and Software Architecture for Unmanned Systems: A Modular Approach*, in K. P. Valavanis (Editor), Applications of Intelligent Control to Engineering Systems, ISCA, Volume 39, Springer, 2009.
3. M. Kontitsis, K. P. Valavanis, *Designing a Real-time Vision System for Small Unmanned Rotorcraft: A Minimal and Cost-effective Approach*, in K. P. Valavanis (Editor), Applications of Intelligent Control to Engineering Systems, ISCA, Volume 39, Springer, 2009.
4. A. Tsalatsanis, K. P. Valavanis, A. Yalcin, *UGV Localization Based on Fuzzy Logic and Extended Kalman Filtering*, in K. P. Valavanis (Editor), Applications of Intelligent Control to Engineering Systems, ISCA, Volume 39, Springer, 2009.
5. K. P. Valavanis, M. Kontitsis, *A Historical Perspective on Unmanned Aerial Vehicles*, in K. P. Valavanis (Editor), Advances in Unmanned Aerial Vehicles: State of the Art and the Road to Autonomy, ISCA, Volume 33, Springer, 2007.
6. I. A. Raptis, K. P. Valavanis, *Airplane Basic Equations of Motion and Open-Loop Dynamics*, in K. P. Valavanis (Editor), Advances in Unmanned Aerial Vehicles: State of the Art and the Road to Autonomy, ISCA, Volume 33, Springer, 2007.
7. M. Castillo-Effen, C. Castillo, W. Moreno, K. P. Valavanis, *Control Fundamentals of Small Helicopters: A Survey*, in K. P. Valavanis (Editor), Advances in Unmanned Aerial Vehicles: State of the Art and the Road to Autonomy, ISCA, Volume 33, Springer, 2007.
8. W. Alvis, C. Castillo, M. Castillo-Effen, W. Moreno, K. P. Valavanis, *A Tutorial Approach to Small Unmanned Helicopter Controller Design for Non-aggressive Flights*, in K. P. Valavanis (Editor), Advances in Unmanned Aerial Vehicles: State of the Art and the Road to Autonomy, ISCA, Volume 33, Springer, 2007.

9. I. K. Nikolos, N. C. Tsourveloudis, K. P. Valavanis , *Evolutionary Algorithm Based Path Planning for Multiple UAV Cooperation*, in K. P. Valavanis (Editor), Advances in Unmanned Aerial Vehicles: State of the Art and the Road to Autonomy, ISCA, Volume 33, Springer, 2007.
10. R. D. Garcia, K. P. Valavanis, *A Modular On-Board Processing System for Small Unmanned Vehicles*, in K. P. Valavanis (Editor), Advances in Unmanned Aerial Vehicles: State of the Art and the Road to Autonomy, ISCA, Volume 33, Springer, 2007.
11. K. P. valavanis, G. J. Vachtsevanos, P. J. Antsaklis, *The Road Ahead*, in K. P. Valavanis (Editor), Advances in Unmanned Aerial Vehicles: State of the Art and the Road to Autonomy, ISCA, Volume 33, Springer, 2007.
12. N. Tsourveloudis, L. Doitsidis, K. Valavanis, “*Autonomous Navigation of Unmanned Vehicles: A Fuzzy Logic Perspective*”, Cutting Edge Robotics, pp: 291-310 (ISBN 3-386611-038-3), 2005.
13. J. A. Katsigiannis, P. S. Georgilakis, A. T. Souflaris, K. P. Valavanis, “*Diagnosing Transformer Faults with Petri Nets*”, Lecture Notes in Artificial Intelligence, Springer, Vol. LNAI 3025, pp. 420-431, May 2004. (Initially presented at the Third Hellenic Conference on Artificial Intelligence, Samos, Greece.)
14. N. D. Hatzigrygiou, N. A. Fountas, K. P. Valavanis, “*Petri Net Models in the Restoration of Power Systems Following System Collapse*”, in C. T. Leondes (Editor) Knowledge Based Systems: Techniques and Applications, Vol. 4, pp: 1190-1223, Academic Press, 2001.
15. S. R. Malladi, K. P. Valavanis, M. C. Mulder, “*Control and Coordination of a Redundant Manipulator*”, in Intelligent Control Systems: Theory and Applications, pp: 702-731, M. M. Gupta and N. K. Sinha (Editors), IEEE Press, 1995.
16. K. P. Valavanis, S. G. Tzafestas, “*Expert Systems in Intelligent Robotics and Control*”, in Expert Systems in Engineering Applications, pp: 259-268, S. Tzafestas (Editor), Springer Verlag, 1993.
17. A. I. Kokkinaki, K. P. Valavanis, S. Tzafestas, “*A Survey of Expert System Tools and Engineering Based Expert Systems*”, in Expert Systems in Engineering Applications, pp: 367-378, S. Tzafestas (Editor), Springer Verlag, 1993.
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122. J. Zheng, K. P. Valavanis, J. Gauch, "*Object Extraction for Color Robotic Vision Systems*", Proceedings of the 6th IEEE International Symposium on Intelligent Control, pp: 449-456, Arlington, VA, USA, August 1991.
123. K. P. Valavanis, G. Seetharaman, M. Bayoumi, M. Mulder, "*On a Distributed Intelligence Materials Handling System*", Proceedings of the IFAC International Symposium on Distributed Intelligence Systems, pp: 217-222, Arlington, VA, USA, August 1991.
124. K. P. Valavanis, "*An Intelligent Robotic System with Low Level Diagnostic Intelligence Capabilities*", Proceedings of the 13th IMACS World Congress Special Sessions, Dublin, Ireland, July 1991. (Short paper)
125. K. P. Valavanis, "*Stability Analysis of the PUMA Robot Under Model Mismatch*", Proceedings of the 13th IMACS World Congress Special Sessions, Dublin, Ireland, July 1991. (Short paper)
126. C. A. Protopapas, B. K. Papadias, A. V. Machias, K. P. Valavanis, "*Introduction to Intelligent Power Systems*", Proceedings of the Third International Symposium on Expert System Applications to Power Systems, Tokyo, Japan, April 1991.
127. K. P. Valavanis, J. Zheng, J. Gauch, "*On Impulse Noise Removal in Color Images*", Proceedings of the IEEE International Conference on Robotics and Automation, pp: 144-149, Sacramento, CA, USA, April 1991.
128. H. Stellakis, K. P. Valavanis, "*Fuzzy Logic Based Modeling of the Organizer of Intelligent Robotic Systems*", Proceedings of the 29th IEEE Conference on Decision and Control, Hawaii, December 1990.
129. K. P. Valavanis, T. B. Larsson, S. P. Gardner, "*Stability Evaluation of the PUMA - 560 Robot Arm*

- Under Model Mismatch*", Proceedings of the SPIE Conference in Intelligent Robotics in Space, Boston, MA, USA, November 1990. (Invited paper)
130. J. Zheng, K. P. Valavanis, J. Gauch, "*The Object Extraction Using Color Information in Computer Vision*", Proceedings of the International Conference on Automation, Robotics and Computer Vision, ICARCV, Singapore, September 1990.
 131. M. M. Kokar, C. Anderson, T. Dean, K. Valavanis, W. Zadrozny, "*Knowledge Representations for Learning Control*", Proceedings of the 5th IEEE International Symposium on Intelligent Control, pp: 389-399, Philadelphia, PA, USA, September 1990.
 132. C. A. Jacobson, K. P. Valavanis, "*Review of the 4 - Parameter Controller Approach for FDI Problems*", Proceedings of the 5th IEEE International Symposium on Intelligent Control, pp: 577-582, Philadelphia, PA, USA, September 1990.
 133. K. P. Valavanis, G. N. Saridis, "*A Review of Intelligent Control Based Methodologies for the Modeling and Analysis of Hierarchically Intelligent Systems*", Proceedings of the 5th IEEE International Symposium on Intelligent Control, pp: 15-20, Philadelphia, PA, USA, September 1990.
 134. K. P. Valavanis, S. J. Carelo, "*Efficient Organization Level Planning for Robotic Assemblies and Intelligent Robotic Systems*", Proceedings of the IEEE American Control Conference, June 1990.
 135. K. P. Valavanis, C. A. Jacobson, B. Gold, "*An Application of the 4 - parameter Controller to the Robot Payload Variation Problem*", Proceedings of the 28th IEEE Conference on Decision and Control, pp: 2658-2663, Tampa, FL, USA, December 1989.
 136. P. Yuan, K. P. Valavanis, "*Design of an Intelligent Robotic System Organizer via Expert System Techniques*", Proceedings of the SPIE/Intelligent Controls Conference, pp: 121-135, Cambridge, MA, USA, November 1988.
 137. P. Yuan, K. P. Valavanis, "*Design of an Intelligent Robotic System Using Microprocessor Based Configuration and Logic Design Techniques*", Proceedings of the 3rd IEEE International Symposium on Intelligent Control, pp: 615-622, Arlington, VA, USA, August 1988.
 138. K. P. Valavanis, "*Knowledge Based (Expert) Systems versus Intelligent Machines*", Proceedings of IMACS 88, Paris, France, July 1988.
 139. J. S. Ahuja, K. P. Valavanis, "*Modified Petri Nets for Comprehensive Modeling of Flexible Manufacturing Systems*", Proceedings of IMACS 88, Paris, France, July 1988.
 140. J. S. Ahuja, K. P. Valavanis, "*A Hierarchical Modeling Methodology for Flexible Manufacturing Systems Using Extended Petri Nets*", Proceedings of the 1988 International Conference on Computer Integrated Manufacturing, pp: 350-356, RPI, Troy, NY, USA, May 1988.
 141. K. P. Valavanis, G. N. Saridis, "*Information Theoretic Modeling of Intelligent Robotic Systems, Part I: The Organization Level*", Proceedings of the 26th IEEE Conference on Decision and Control, pp: 618-626, Los Angeles, CA, USA, December 1987.
 142. K. P. Valavanis, G. N. Saridis, "*Information Theoretic Modeling of Intelligent Robotic Systems, Part II: The Coordination and Execution Levels*", Proceedings of the 26th IEEE Conference on Decision and Control, pp: 627-633, Los Angeles, CA, USA, December, 1987.
 143. G. N. Saridis, K. P. Valavanis, "*On the Theory of Intelligent Controls*", Proceedings of the SPIE/Intelligent Controls Conference, pp: 488-495, Boston, MA, USA, November 1987.
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 145. G. N. Saridis, K. P. Valavanis, "*Mathematical Formulation of the Organization Level of an Intelligent Machine*", Proceedings of the IEEE Robotics and Automation Conference, pp: 267-272, San Francisco, CA, USA, April 1986.
 146. M. B. Leahy, K. P. Valavanis, G. N. Saridis, "*The Effects of Dynamic Models on Robot Control*", Proceedings of the IEEE Robotics and Automation Conference, pp: 49-54, San Francisco, CA, USA, April 1986.
 147. M. B. Leahy, L. M. Nugent, K. P. Valavanis, G. N. Saridis, "*Efficient Dynamics for a PUMA-600*", Proceedings of the IEEE Robotics and Automation Conference, pp: 519-524, San Francisco, CA, USA,

- April 1986.
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 149. P. P. Bonissone, K. P. Valavanis, "*A Comparative Study of Different Approaches to Qualitative Physics Theories*", Proceedings of the 2nd Conference on Artificial Intelligence Applications, pp: 236-243, Miami, FL, USA, December 1985.
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 151. G. N. Saridis, K. P. Valavanis, "*Information Theoretic Approach for Knowledge Engineering and Intelligent Machines*", Proceedings of the IEEE American Control Conference, pp: 1098-1103, Boston, MA, USA, June 1985.
 152. K. P. Valavanis, M. B. Leahy, G. N. Saridis, "*Real-Time Evaluation of Robot Control Methods*", Proceedings of the IEEE Robotics and Automation Conference, pp: 644-649, St. Louis, MO, March 1985.
 153. K. P. Valavanis, G. N. Saridis, "*On the Comparison of Robot Control Methods by Simulation*", Proceedings of the Optimization Days, Montreal, Canada, May 1984.
 154. G. N. Saridis, K. P. Valavanis, "*Intelligent Robotic Control*", Proceedings of the IEEE MELECON Conference, C10.04, Athens, Greece, May 1983.
 155. G. N. Saridis, K. P. Valavanis, "*Application of Optimal Control Theory to the Unimation PUMA Arm*", Proceedings of the IEEE Conference on Systems Man and Cybernetics, pp: 253-256, Seattle, WA, October 1982. (Invited)

TECHNICAL REPORTS (UNTIL 1992)

1. S. Ramaswamy, K. P. Valavanis, S. P. Landry, "*A Summary of Failure Types and Accommodation Techniques in Manufacturing Systems*", CACS Technical Report, TR 92-1-4 1992.
2. G. K. Gavini, K. P. Valavanis, "*A Review of Coordinated Multiple Robot Manipulators*", CACS Technical Report, TR 92-1-1, ULL 1992.
3. G. Seetharaman, K. P. Valavanis, M. Bayoumi, M. Mulder, "*A Hybrid Range Intensity Sensor for Dynamic Scene Analysis and Sensor Fusion*", CACS Technical Report, TR 91-1-12, ULL, May 1991.
4. S. Ramaswamy, K. P. Valavanis, "*Review of Robot Programming Languages*", CACS Technical Report, TR 91-2-2, ULL 1991.
5. S. Ramaswamy, K. P. Valavanis, S. P. Landry, "*Modeling and Analysis of a Materials Handling CIM System Using Extended Petri Nets*", CACS Technical Report, TR 91-1-6, ULL 1991.
6. S. Surka, K. P. Valavanis, "*Efficient Cellular Automata for Edge Relaxation*", Technical Report RL-TR-1987-05.
7. S. Surka, K. P. Valavanis, "*Edge Segmentation by Cooperative Grouping Processes*", Technical Report RL-TR-1987-06.
8. M. B. Leahy, L. M. Nugent, K. P. Valavanis and G. N. Saridis, "*Efficient PUMA Manipulator Jacobian Calculation and Inversion*", TR-RAL-76, RPI, 1986.
9. M. B. Leahy, K. P. Valavanis, L. M. Nugent and G. N. Saridis, "*Efficient Dynamics for a PUMA-600*", TR-RAL-63, RPI, January 1986.
10. M. B. Leahy, K. P. Valavanis, G. N. Saridis, "*Evaluation of Dynamic Models for Robot Control*", TR-RAL-57, RPI, May 1986.
11. M. B. Leahy, K. P. Valavanis, G. N. Saridis, "*Real-Time Evaluation of Robotic Control Methods*", TR-RAL-42, RPI, October 1984.
12. M. B. Leahy, K. P. Valavanis, "*Software for Real-Time Control of a VAX-11/750 Computer Controlled PUMA-600 Robot*", TR-RAL-37, RPI, July 1984.
13. M. B. Leahy, K. P. Valavanis, "*A VAX Computer Controlled PUMA-600 Robot Arm: Software Manual*", TR-RAL-33, RPI, 1984.

14. K. P. Valavanis, G. N. Saridis, "*Review of the Phase I ITA System. Evaluation of the Strategic Planner and the Tactical Planner*", submitted to the Martin Marietta Corporation through the Center of Manufacturing Productivity and Technology Transfer, RPI, 1984.
15. G. N. Saridis, K. P. Valavanis, "*Final Report of the ORNL Work Order 19X-43358V Research for the Organization of CESAR*", RAL, RPI, 1983.
16. K. P. Valavanis, "*Controlling the PUMA-600 Robot Arm with and without using VAL*", TR-RAL-16, RPI, May 1983.
17. K. P. Valavanis, "*Unimate PUMA Manipulator Manual*", TR-RAL-3, RPI, March 1982.

RESEARCH & DEVELOPMENT EXPERIENCE – PROJECT MANAGEMENT

Since 9/1, 2008 (U of Denver):

- Transferred research equipment to DU, and established the DU Unmanned Systems Laboratory, *DU²SL*.
- Designing a universal landing platform (patented).
- Designing sense-and-avoid systems for small UAVs, including rotorcraft.
- Designing and building the next generation of multi-purpose unmanned ground vehicles and light-weight unmanned helicopters.
- Designing and developing universal navigation controllers based on XMOS technology, emphasizing parallelism of operations.
- Designing complex multivariable controllers and nonlinear (backstepping) controllers for unmanned rotorcraft (with guaranteed stability).
- Designing and implementing a nonlinear model predictive controller with a recurrent neural network for on-line/real-time accommodation of helicopter failures leading to a vertical autonomous autorotation landing. Extensions to manned helicopters.
- Multiple unmanned helicopter autonomous navigation and collision avoidance in the presence of failures, including see and avoid systems.
- Developing the 6th generation of miniature autonomous navigation controllers for aerial and ground vehicles.
- Designing a universal landing platform for light-weight helicopters, also serving as a refuel/recharge station.
- Built a helicopter system for pipeline inspection.
- SmartGrid monitoring and security.

2003 - 2008: USF

- Safety, airworthiness, risk analysis and certification procedures for unmanned aerial vehicles;
- Derivation and prototyping of an emergency landing system (in addition to back up systems) for unmanned aerial vehicles: minimizing impact and collateral damage;
- Unmanned vehicle swarms, formation control of UGVs (2-D environment);
- Formation control of UGV - UAV teams (3-D environment);
- Traffic monitoring and management using unmanned helicopters;
- Mathematical modeling, prediction, and evaluation of traffic patterns based on real-time, dynamic, visual data acquired from unmanned helicopters;
- Teams of heterogeneous aerial, ground vehicles:
 - Modeling / control (local, supervisory); design, testing, implementation of controllers
 - Coordination and diagnostics (monitoring and failure accommodation)
 - Sensor fusion, design and testing of vision systems with IR / NIR cameras
 - Hardware and software architectures
 - Sensor networks / ad-hoc networks
- Design of a “custom-made” VTOL-mobile robot system with landing platform;

- Design of vision systems for miniature unmanned aerial vehicles with strict payload limitations;
- Design / building / testing unmanned ground vehicles using off the shelf components: integrating sensor suites, vision and servo controllers for fully autonomous navigation;
- Communication – control of swarms of ground robots: cooperation and collaboration in the presence of communication failures;
- Simulation and visualization environments for robot controller testing and multiple vehicle coordination;
- Parameter identification and estimation for derivation of accurate models of miniature unmanned VTOL vehicles;
- Intelligent sensors;
- Design of autonomous computer-controllers for UAV and VTOL vehicles;
- Energy efficient robot systems;
- Fault tolerance and integrated control and diagnostics for unmanned vehicles;
- Petri Nets and their applications to hybrid systems, production systems and electric power systems.

1999 – 2003: Technical University of Crete (All funded projects)

- Modeling, real-time, sensor-based control and autonomous navigation with collision avoidance of unmanned aerial vehicles (UAV). Enhancement of flying and operational capabilities.
- Built a custom made mobile robot.
- VTOL design specifications and control architecture.
- Flight simulator environment with multiple UAV / VTOL capabilities and interface with controllers.
- Autonomous, fuzzy-logic based navigation including collision avoidance of Underwater Vehicles.
- Developing a modular hardware and software control architecture for UAV “plug-in” missions.
- Designing a cost-effective small jet engine for UAVs.
- Coordinated sensor-based control and navigation of a fleet of skid-steering mobile robots in indoor and outdoor dynamic environments including moving obstacles.
- Modeling, analysis and synthesis of generic manufacturing cells (assembly, disassembly and production line) for production systems (CIM, FMS) control and performance evaluation based on maximization of throughput and minimization of work-in-process (WIP). A fuzzy logic perspective.
- Petri Net based system modeling and control. Applications in CIM systems, FMS, Electric Power Systems (reliability study, failures, diagnostics).
- Reliability and Performance Evaluation of Electric Power Systems.

1997- 2001: Research project collaboration with the Department of Telecommunications, University of Zagreb, and Ericsson – Nikola Tesla, Croatia.

- Agent-based modeling of distributed intelligence systems: mobile / intelligent agents for computer communication networks.
- Development of a formal model of a Networked Virtual Reality service. VR and multimedia based simulation and performance evaluation of distributed systems.
- Theoretical studies and experimental verification of flexible call and service processing models. Definition of application/user level Quality of Service (QoS) requirements and measurements.

1991-1999: Research Projects, University of Louisiana at Lafayette: Robotics and Automation Laboratory (RAL) and Virtual Reality and Multimedia Laboratory (VRML)

I. Distributed and Hierarchical Systems Modeling, Analysis, Synthesis and Performance Evaluation; System Error Identification and Recovery; Planning and Scheduling of Discrete Event Dynamic Systems

- Algorithms and grammars for integrated control and diagnostics of dynamic systems (automated manufacturing systems, DEEDS, robotic assemblies), including fault or error or failure detection, identification, handling, accommodation and recovery. Petri Net models for integrated control and diagnostics of dynamic systems.
- Modeling and scheduling of planning systems based on multi agent coordination, collaboration and group theory. Integration with error recovery mechanisms.
- Petri Net based modeling, simulation and control of asynchronous concurrent systems, more specifically discrete event dynamic systems (DEEDS), which include Flexible Manufacturing Systems (FMS), computer systems, communication protocols, etc.
- Developed several classes of Petri Nets (like Hierarchical Time-Extended Petri Nets, H-EPNs, Parameterized Petri Nets, PPNs) for the hierarchical decomposition and composition of complex systems. Automated Petri Net based techniques for synthesis of complex dynamic systems.

II. Multi-system Coordination and Control

- Supervisory Control: Design of a three level software and hardware architecture (supervisory controller) for real-time control of an integrated work cell consisting of several robot arms, sensors, conveyors and mobile platforms.
- Simultaneous motion control of multiple robot systems: Utilizing coordinated control methods to coordinate the motion of robot arms (PUMA, AdeptOne and AdeptThree) in an overlapping workspace environment, avoiding collisions.

III. Robotics, Mobile Robotics, Underwater Vehicles and Computer Vision

- Robot parameter identification and derivation of simplified dynamic models for real-time control of PUMA and AdeptOne / AdeptThree robots
- Identification of AdeptOne / AdeptThree joint and link parameters using least squares curve fitting algorithms to derive simplified dynamic models for real-time sensor-based control. Testing and Implementation of PID Controllers.
- Integration of add-on modules (suction unit controllers, reconfigurable grippers, real-time bi-directional adjustable speed conveyor belt controllers) with the original AdeptOne and AdeptThree robot controllers.
- Designed special purpose fixed size and reconfigurable grippers to handle (pick and place) limp material without any deformation and/or distortion. Building and testing of prototypes.
- Designed efficient fuzzy logic based controllers for suction generation, regulation and coordination of fixed size and reconfigurable robotic grippers.
- Vision-based robot control system for handling moving objects on a variable speed conveyor belt. Utilizing the Adept Vision systems to derive parameters and features of objects to assist in training and recognition.
- Derived algorithms based on artificial potential field theory (potential panel methods) for mobile robot navigation in 2-D and 3-D environments in the presence of obstacles.
- Derived algorithms using Electrostatic Potential Fields for mobile robot navigation in 2-D dynamic environments (with arbitrarily moving obstacles).
- Derived and implemented a combined Electrostatic Potential Field / Two layer Fuzzy Logic Inference Engine Controller for mobile robot navigation in 2-D dynamic environments (with arbitrarily moving obstacles).
- Mobile robot navigation in 2-D dynamic environments (with arbitrarily moving obstacles) using Neural Networks.
- Sonar sensor based mobile robot navigation and environment mapping.

- Developed algorithms using multiple Total Color Difference (TCD) measures and thresholds for object identification. This measure considers both luminance and chrominance variations for object recognition.
- Developed a color visual monitoring system for image segmentation and classification based on color texture. Applications include wetlands monitoring and underwater robotics.
- Derived techniques and methods to solve problems related to object recognition and obstacle avoidance in domains like wetlands, shallow water fisheries, and deep-water polluted environments.
- Derived new sensor-based, modular hybrid control architecture (using QNX, STD-32 STAR) to replace the original Phantom S2 ROV controller. Converting the ROV to an AUV. Tested fuzzy logic based control techniques for ROV/AUV navigation.
- Mobile and autonomous agent based modeling of robotic fleets: cooperation and coordination issues.

IV. Interactive Graphical Simulation (Virtual Reality and Multimedia) Applications

- Utilized and developed interactive graphical simulation tools for visualization of various systems to facilitate analysis and design.
- Integrated Virtual Reality, Robotics and Multimedia technologies for research projects in Telerobotics, Telepresence, Teleoperation, and Virtual Manufacturing.
- Virtual reality based navigation of underwater vehicles.
- Distributed networked virtual reality and multimedia applications for multi user environments: Case studies in mobile robotics and underwater vehicles.

Other Completed Research Projects (1991 – 94)

- Established the Robotics and Automation Laboratory (RAL) within CACS.
- Developed the research agenda in robotics and automation at the A-CIM Center.
- Developed algorithms for planning and scheduling in automated manufacturing systems.
- Built an integrated CIM and Apparel - CIM work cell environment.
- Automated color defect recognition and identification in fabric material.
- Analysis, synthesis, diagnostics and control of automated manufacturing systems using hierarchical, timed extended Petri nets (H-EPNs) and Parameterized Petri nets (PPNs).
- Established the Intelligent Robotic Systems Laboratory (IRSL) at CACS.
- Designed a hybrid range - intensity sensor with error detection and recovery capabilities for introspective vision.
- Designed architecture for multisensory robotic systems.
- Sensor based control and coordination of redundant appendages based on composite (time and energy) performance measures.
- Modeled and simulated intelligent material handling systems.
- Noise removal techniques from color images (median filters, median vector filters, median type filters, and other nonlinear filters).
- Hierarchical planning and scheduling in robotic systems, assemblies and flexible manufacturing systems with parameterized Petri nets (PPNs).
- Manipulator payload sensitivity analysis and design of robust robotic controllers using the 4 - parameter controller approach. Stability analysis of manipulators with PD/PID controllers.

1986 – 1990: COMPLETED RESEARCH PROJECTS WHILE AT NORTHEASTERN UNIVERSITY

- Modeled the organization level of intelligent robotic systems using Expert System techniques.

- Developed an Expert System in Turbo Pascal.
- Modeled and simulated the performance of Flexible Manufacturing Systems using the Theory of extended Petri nets. Developed a simulation software package in Turbo Prolog.
 - Interfaced an IVS-100, Analog Devices Vision System with a 3600 Symbolics Lisp Machine, to develop a high-level 3-D vision system.
 - Interfaced a PUMA-260 robot arm MARK-II Series, with a MICRO VAX-II computer for real-time closed loop manipulator control.
 - Completed Research Projects January, 1982 - December 1985
 - Completed the doctoral research in the area of hierarchically intelligent control systems. Developed a mathematical formulation for the analytical design of autonomous intelligent machines operating in uncertain environments (Ph.D. Thesis).
 - Supervised a team project related to the study of the dynamics of a PUMA-600 arm to define the dominant terms governing the performance of each individual joint.
 - Static friction and coupling effects were considered, and different control algorithms tested in real-time.
 - Compared the performance of different approaches to Qualitative Physics Theories.
 - Developed a Computer controlled robotic system for real-time control of general-purpose manipulators, by interfacing a Unimation PUMA-600 robot arm to a VAX-11/750 computer, via a modified arm controller. Implemented and tested various control algorithms in real-time.
 - Developed the software for an Expert System on the IBM-3033 (MTS) computer for troubleshooting the Unimation PUMA-600 robot arm.
 - Operated Computer Aided Control System Design (CACSD) packages. Designed controls for several multivariable control systems.

PART III

FUNDING RECORD

SINCE SEPTEMBER 1, 2008 (DU)

1. “*MRI Development: Heterogeneous, Autonomic Wireless Control Networks for Scalable Cyber-Physical Systems*”, NSF; Amount: \$2,211,778; Period: 8/1/09-7/31/12 (Co-PI).
2. “*Collaborative Research: I/UCRC for Safety, Security and Rescue*”, NSF; Award Amount: \$500,890 (\$275K from NSF, \$55K per year for 5 years, 1 year at a time, \$225,890 in cost sharing); Period Covered: 5 Years, effective August 1 2009. (Co-PI)
3. “*Collaborative Research: I/UCRC: Safety Security Rescue Research Center (SSR-RC)*”, National Science Foundation (NSF), *Transfer Grant Amount: \$129,365.00*. Period: 9/1/8008-7/31/2010.

JUNE 2003 – AUGUST 2008 (USF)

1. “*National Institute for Systems Testing and Productivity of the National Institute for applied Computational Intelligence*”, Department of the Navy, SPAWAR, Contract N00039-06-C-0062, \$1,6M; 2006 – December 11, 2007 (Valavanis – lead PI). Projects funded:
 - a. “*An Integrated Autonomous Unmanned Aerial Vehicle – Unmanned Ground Vehicle System Applicable to Military and Civilian Domains*”
 - b. “*Swarm-Based Formation Control of Multiple, Networked and Heterogeneous Unmanned Ground - Aerial Vehicles*”
 - c. “*Communication System and Network Design for Unmanned Systems: A Feasibility Study for Autonomous Underwater Vehicles*”
2. “*Collaborative Autonomous Unmanned Aerial – Ground Vehicle Systems for Field Operations*”, Army Research Office Contract W911NF-06-1-0069; Phase I Funds: \$385,212.00 for 12 months (PI: Valavanis). Subsequent phases to follow in 2008.
3. “*Real-time Video Data Collection Using Small Unmanned Helicopters for Traffic Monitoring, Analysis, Evaluation, Management and Network Planning*”, \$100,000.00 for 8 months, Hillsborough County, Traffic Department, FL (Co-PI).
4. “*High power, inexpensive vision system for miniature helicopters for traffic monitoring and emergency response*”, submitted to the FL High Tech Corridor Program. \$99,500.00 for 12 months (PI: Valavanis).
5. “*An Automated VTOL-Based Traffic Management, Monitoring and Emergency Response System*”, funded by DOT through CUTR, \$189,976.00 for 12 months (PI: Valavanis, Co-PIs: Hagen, Murphy).
6. “*Heterogeneous Unmanned Aerial-Ground Vehicle Collaboration and Coordination: Distributed Autonomy, Decision Making and Fault Tolerance*”, ONR Grant N00014-04-1-0487, \$442,500.00, May 2004-July 2005 (PI: Valavanis Co-PI: Murphy).
7. “*A Visual Environment for Design, Development, Testing and Evaluation of Aerial Vehicle Integrated Control and Diagnostics*”, funded by ONR/CSS, \$85,000.00 for 7 months (PI: Murphy, Co-PI: Valavanis).
8. “*Naval Automation and Information Management Technology; Research Focus: Distributed Sensor Fusion, UAV-UGV Navigation and Control*”, ONR Grant N00014-03-01-786, \$1,050,000.00, May 2003-July 2004 (PI: Murphy, Co-PIs: Valavanis, and Labrador).

1999-2003: Technical University of Crete

1. “*Stability of Unmanned Vehicle Flights: Control Techniques and Choice of Optimal Characteristics*”, funded by the Greek Secretariat for Research and Technology through the EU Funds Forum 2000-2006; total amount 100,000.00 euros.
2. “*Complete study for automating the olive oil kernel production – A sensor based fuzzy logic perspective*”, \$180,000.00 for 18 months (early 2004).
3. “*Development of an Integrated Hardware System for Autonomous Navigation of Unmanned Vehicles*”, submitted with EADS-3SIGMA S. A. (SBIR). 01 PRAXE-132, amount: \$55,000.00 for 18 months (funded in 2003).
4. “*Modeling, Analysis, Synthesis and Performance Evaluation of Random Topology Production Systems with Petri Nets*”, submitted in collaboration with the University of Maribor, Slovenia. Amount \$13,000.00 for one year (funded in 2003).
5. “*Awareness and Dissemination Activities for Advanced Control in Europe*” (ADACIE), IST-01-7-2B, Programme: IST, total amount: 196,600.00 €; TUC portion 24,000.00 €. (PI/PD: Prof. Pedro Albertos, Polytechnic University of Valencia, one of the Co-PIs, Prof. Kimon Valavanis).
6. “*Development of an Integrated Airborne Fire Detection System*”, funded by the Greek Secretariat for research and Technology through the EU Funds Forum 2000-2006. Members: EADS-3 SIGMA, Technical University of Crete (TUC), National Technical University of Athens (NTUA). 18 months, \$160,000.00. (PI/PD)
7. “*Development of a VTOL Unmanned Aerial Vehicle*” – Phase I, funded by the Greek Secretariat for research and Technology through the EU Funds Forum 2000-2006. Members: EADS-ATLAS-3 SIGMA, Technical University of Crete (TUC). 6 months, \$40,000.00. (PI/PD)
8. “*Development of a Turbo-Jet Engine for an Unmanned Aerial Platform*” – Phase I funded by the Greek Secretariat for research and Technology through the EU Funds Forum 2000-2006. Members: EADS-3 SIGMA, Technical University of Crete, 6 months, \$40,000.00. (PI/PD)
9. “*Hierarchical Intelligent Control of Production Systems: A Fuzzy Logic Perspective*”, funded by the Greek Secretariat for research and Technology through the EU Bilateral Agreements Program Greece – Slovenia 2000-2002. Members: Technical University of Crete (TUC) and University of Maribor, 18 months \$15,000.00 each member.
10. “*Development of an Intelligent Autonomous Navigation System for Unmanned Aerial Vehicles*”, funded by the Greek Secretariat for research and Technology through the EU Funds Forum 1994 - 1999, No. 99BE118. Members: STN ATLAS-3 SIGMA, Technical University of Crete (TUC), National Technical University of Athens (NTUA). 18 months \$210,000.00. (PI/PD)
11. “*Robust Methodologies for the Integration of a Fleet of Commercially Available Mobile Robots: Application to the Inspection and Security of Office Buildings*”, funded by the Greek Secretariat for research and Technology through the EU Funds Forum 1994 – 1999. Members: TUC, NTUA and U of Patras (UP). 18 months \$120,000.00. (TUC PI/PD)

1997-2001: In Collaboration with the Department of Telecommunications, University of Zagreb, Croatia

12. “*Call and Service Processing for Advanced Network Architectures*”, funded by the Croatian Ministry of Science and Technology, Project No. 036030. Phase I: 5/1997 - 8/2000, Phase II: 9/2000-12/2001.
13. “*Networked Virtual Reality*”, funded by Ericsson Nikola Tesla, Project No. R00101. Duration: 11/1999-10/2001

Other Funded Research Collaboration Projects with Greek Universities (role as Research Scientist) while being a faculty in the US (before 1999)

14. “*Improvement and Better Utilization of Transmission Lines of Electric Power Systems*”, funded by the Greek Secretariat for research and Technology through the EU Funds Forum 1994 – 1999 (1996 – 1998 – ΠΕΝΕΔ 1996). NTUA Division of Electric Power Systems.
15. “*Neuro - Fuzzy Robust Control of Intelligent Autonomous Robotic Systems*”, funded by the Greek Secretariat for research and Technology through the EU Funds Forum 1994 – 1999 (1996-98 - ΠΕΝΕΔ – 1996). NTUA, Division of CS.
16. “*Diagnosis and Identification of Failures in Industrial Systems with Hierarchical Extended Petri Nets*”, funded by the Greek Secretariat for research and Technology through the EU Funds Forum 1994 – 1999 (1996-98, ΠΕΝΕΔ – 1996). University of Patras, Dept. of ECE.

1991-1999: Funded projects while at the University of Louisiana at Lafayette

17. “*Intelligent Machines for the Job Floor*”, Board of Regents Support Fund (BORSF), Industrial Ties Research Subprogram (ITRS), \$475,000 (\$125K from the state, \$350K as matching funds) for three years, 1999-2002 (Co-PI).
18. “*Modeling, Design and Prototyping of a Multi-degree of Freedom Robotic Gripper System for Limp Material Manipulation*”, National Science Foundation (NSF DMII-9701533); amount \$189,720.00 for two years (1997-1999).
19. “*International Advanced Robotics Programme (IARP) Workshop on AUVs for Shallow Waters and Coastal Environments*”, National Science Foundation (BES-9712565); amount \$49,976 for one year (1997-1998).
20. “*Design and Development of Automated Storage and Retrieval System*”, Stuller Settings, Inc.; amount: \$180,000.00 for one year (1998).
21. “*Reconfigurable Robotic Grippers for Handling Limp Material: an Attempt to Automate the U.S. Apparel Industry*”, Louisiana Education Quality Support Fund (LEQSF), Industrial Ties Component; amount: \$230,000.00 for three years (1996-1999).
22. “*Demand Activated Manufacturing Architecture (DAMA) Center Research Project*”, Department of Energy, ORNL; amount \$619,714.54 for 2 years (1996-1998).
23. “*Object Identification, Classification and Avoidance in 3-D Underwater Automated Surveillance*”, National Science Foundation, (BES 95-06771); amount: \$270,717.00 for three years (1995-1998).
24. “*International Program Development in Undersea Robotics and Intelligent Controls: A Joint U.S./Portugal Effort*”, National Science Foundation (NSF, BES 94-15748); amount \$52,675 for one year (1994-95).
25. “*Establishment of an Apparel Research Network (ARN)*”, Defense Personnel Support Center (DPSC-FPCA-1, BAA 93-01) DLA/DOD; initial amount \$350,000.
26. “*Establishment of the Multimedia and Virtual Reality Laboratory*”, Louisiana Education Quality Support Fund Enhancement Component; amount \$150,000.00 for 1 year.
27. “*Design of a Flat Plate Gripper for Apparel*”, Textiles and Clothing Technology Corporation, [TC]²; \$75,000.00 for 6 months (1994).
28. “*A Dynamic Resource Allocation System*”, Defense Logistics Agency of the DOD, DLA/DOD, DLA 900-91-C-1482, Phase III; amount \$190,272.46 for 1.5 years (1992-94).
29. “*Modeling of Hierarchical Systems and FMSs with Extended Petri Nets*”, Louisiana Educational Quality Support Fund, (LEQSF) Research and Development Component, LEQSF (1991-1993) RD-A-40; amount: \$53,240 for 2 years (1991-1993).
30. “*Modeling and Analysis of Hierarchically Intelligent Systems with Self-Organizing and Diagnostic Intelligence Capabilities*”, Louisiana Educational Quality Support Fund, (LEQSF)

- Research and Development Component, LEQSF (1991-1994) RD-A-43; amount: \$104,769 for 3 years (1991-1994).
31. “*IRSL: Intelligent Robotic Systems Laboratory*”, Louisiana Educational Quality Support Fund (LEQSF), Enhancement Component, LEQSF (1991-1992)-ENH-106; amount: \$110,000 for one year (1991-1992).
 - 35. “*Louisiana State Appropriated Funding*” for A-CIM; amount \$419,269 per year, every physical year (1993-1999). [**Total 6 years, approximately \$2,900,000.00.**]
 36. *University of Louisiana at Lafayette Research and Scientific Support Fund*, Equipment Grant, amount \$69,500, 1997.
 37. *University of Louisiana at Lafayette Grant: Robotics and Automation Laboratory (RAL)* Equipment, Enhancement Grant, January 1994, amount \$20,000.
 38. *Apparel-CIM Center: RAL* Equipment Grant (R-552), amount \$50,000, 1993.
 39. *Establishment of the Robotics Laboratory at the Center for Advanced Computer Studies*”, UL at Lafayette, Recruitment Grant 1991; amount: \$60,000.00.

1986-1990 while at Northeastern University

40. “*The Establishment of the Robotics and Automation Laboratory at Northeastern University*”, Analog Devices Research Grant, 1987 - 1990; amount \$135,000.00 (PI/PD).
41. *Northeastern University Equipment Grant*, amount \$38,000, 1986.

PART IV

TEACHING EXPERIENCE: GRADUATE AND UNDERGRADUATE COURSES TAUGHT

INVITED SHORT COURSES TAUGHT

Universita di Ancona, Italy

- “Unmanned Systems” (*a graduate level course offered to all PhD students in Italian Universities through the University of Ancona, College of Engineering*)
- “Mobile Robot Systems: Architectures and Control”, (taught in Bertinoro, Italy as part of the PhD summer school in robotics)

University of Zagreb (intensive, fast-track graduate courses)

- Agents and Agent Based Systems
- Petri Nets and Distributed Systems
- Concurrent Systems
- Digital Control (undergraduate)

IN UNIVERSITIES HOLDING TENURED POSITIONS

University of Denver

- Unmanned Aerial Systems (Taught at Lockheed Martin)
- Engineering Analysis and Topics (Taught at Lockheed Martin)
- Controls
- Advanced Robotics
- Digital Communications
- Digital Control
- Computer Networks

University of South Florida (Since Spring 2003)

- Introduction to Discrete Structures
- Computer System Design
- Advanced Robotics – New graduate course
- Applied Machine Intelligence (graduate) – New course
- Introduction to AI Robotics (graduate)

Technical University of Crete (1999-present)

- Reliability Theory
- Intelligent Control
- Mechatronics and Process Control
- Introduction to Robotics
- Applied Petri Nets (graduate)
- Advanced Robotics (graduate)

University of Louisiana at Lafayette and Northeastern (CACs, CS and ECE)

- Computer and Communication Networks
- Computer Systems Performance Evaluation
- Robotic and Automation Systems
- Robotic Vision and Sensors
- Special Topics in Machine Vision
- Special Topics in Robotics
- Intelligent Systems and Machines
- Artificial/Machine Intelligence

- Classical Control Theory
- Linear Systems Analysis (undergraduate)
- Digital Control Systems
- Stochastic Control Systems
- Computer Integrated Manufacturing Systems
- Digital Signal Processing
- Discrete Mathematics (undergraduate)

LIST OF GRADUATE & GRADUATED STUDENTS

CURRENT PHD CANDIDATES AT DU

Currently advising a group of eight PhD students.

UNIVERSITY OF SOUTH FLORIDA PHD GRADUATES

1. **Ioannis Raptis** (Advisor, Kimon Valavanis, Co-Advisor, Wilfrido Moreno)
Dissertation Title: Nonlinear and Linear Controller Design for Unmanned Rotorcraft.
2. **Kostas Dalamagkidis** (Advisor, Kimon Valavanis, Co-Advisor, Les Piegl)
Dissertation Title: Autonomous Vertical Autorotation for Unmanned Rotorcraft.
3. **Michael Kontitsis** (Advisor, Kimon Valavanis, Co-Advisor, Sudeep Sarkar)
Dissertation Title: Design and Implementation of an Integrated Dynamic Vision System for Autonomous Systems Operating in Uncertain Domains.
4. **Stelios Ioannou** (Co-Advisors, Elias Stefanakos, Kimon Valavanis)
Dissertation Title: Discrete Linear Constrained Multivariate Optimization for Power Sources of Mobile Systems.
5. **Carlos Castillo** (Co-Advisors, Wilfrido Moreno, Kimon Valavanis)
Dissertation Title: Fault-Tolerant Adaptive Model Predictive Control Using Joint Estimation Kalman Filters for Small-Scale Helicopters.
6. **Athanasios (Sakis) Tsalatsanis** (Co-advisors, Ali Yalcin, Kimon Valavanis)
Dissertation Title: Control of Autonomous Robot Teams in Industrial Applications.
7. **Anuj Puri**
Dissertation Title: Statistical Profile Generation of Real-Time UAV-based Traffic Data.
8. **Namir Aldawoodi** (Co-advisors, Kimon Valavanis, Rafael Perez)
Dissertation Title: An Approach to Designing an Unmanned Helicopter Autopilot Using Genetic Algorithms and Simulated Annealing.
9. **Wendy Alvis** (Co-advisors, Wilfrido Moreno, Kimon Valavanis)
Dissertation Title: Development of an FPGA Based Autopilot Hardware Platform for Research and Development of Autonomous Systems.
10. **Laura Barnes**
Dissertation Title: A Potential Field Based Formation Control Methodology for Robot Swarms.
11. **Richard Garcia**
Dissertation Title: Designing an Autonomous Helicopter Testbed: From Conception through Implementation.
12. **Mauricio Castillo-Effen** (Co-advisors, Wilfrido Moreno, Kimon Valavanis)
Dissertation Title: Cooperative Localization in Wireless Networked Systems.

1999-2003, ADVISOR / CO-ADVISOR OF GRADUATED PHD STUDENTS – TUC GREECE

1. George Atsalakis: *Stock Market Forecasting Techniques – A Neuro-Fuzzy Perspective.*

2. George Tsinarakis: *Supervisory Control and Performance Evaluation of Random Topology Manufacturing Systems with Hybrid Petri Nets.*
3. Vangelis Kanakakis: *Fuzzy Logic Based navigation of Underwater Vehicles.*

GRADUATED M.Sc. STUDENTS

1. M. Kontitsis: *A Machine Vision System for Surveillance from Unmanned Aerial Systems.*
2. E. Theodorou: *A Survey of Methods for Robot and Robot Team Localization in Initially Unknown / Known Environments.*
3. L. Doitsidis: *Navigation and Control of Skid-steering Autonomous Mobile Robots with Diverse Sensors.*
4. G. Tsinarakis: *Modeling, Analysis, Synthesis and Performance Evaluation of Production Systems with Several Classes of Petri Nets.*
5. G. Tsakiroopoulos: *Modeling of Electric Power Systems with Petri Nets.*

DIPLOMA THESIS STUDENTS

1. S. Smyrnis: *A feasibility study for preventive maintenance of Power plants: The case of the AHS in Megalopolis.*
2. E. Koraki: *Navigation and control of a skid steering mobile robot with genetic algorithms.*
3. A. Tsalatsanis: *The vision system of the ATRV-mini mobile robot: functionality and software library.*
4. D. Kapiris: *Navigation of the ATRV-mini mobile robot with sonar sensors.*

1986-1998: UNIVERSITY OF LOUISIANA AT LAFAYETTE & NORTHEASTERN UNIVERSITY

STUDENTS GRADUATED WITH A PH.D. (12)-ENGINEERING DEGREE (2), TOTAL 14.

1. **Maja Matijasevic** (In collaboration with the University of Zagreb)
Dissertation Title: Distributed Networked Multimedia and Virtual Reality Applications for Multi-User Environments
2. **Timothy M. Hebert**
Dissertation Title: Navigation of an Autonomous Vehicle Using a Combined Electrostatic Potential Field / Fuzzy Inference Approach
3. **Christophe Veltsos**
Dissertation Title: Automated Petri Net Synthesis for the Modeling and Analysis of Complex Dynamic Systems
4. **Georgios A. Demetriou**
Dissertation Title: A State Configured Hierarchical Architecture for the Control of an Autonomous Underwater Vehicle
5. **Ramesh Kolluru**
Dissertation Title: Modeling, Design, Prototyping and Performance Evaluation of a Sensor-Based Robotic Gripper System for Automated Limp Material Handling
6. **George Paschos**
Dissertation Title: Color and Texture Based Image Analysis: Segmentation and Classification
7. Yanjun Zhang
Dissertation Title: Potential Based Panel Method for Robot Motion Planning
8. **Angelika I. Kokkinaki**
Dissertation Title: A Dynamic Planning System for Automated Manufacturing Environments
9. **Denis Gracanin**
Dissertation Title: Fundamentals of Parameterized Petri Nets

10. **Srinivasan Ramaswamy**
Dissertation Title: Hierarchical Time - Extended Petri Nets (H-EPNs) for Integrated Control and Diagnostics of Multi Level Systems
11. **Srinivasa R. Malladi**
Dissertation Title: A Sensor-Based Path Planning Algorithm for Control and Coordination of Multi-jointed Robotic Appendages
12. **Jue Zheng**
Dissertation Title: Smoothing and Segmentation of Color Images in Computer Vision
13. **Barry Gold**
Eng. Deg. Thesis: Aspects of Trajectory Tracking Control of a Robot Arm
14. **Stefan Surka**
Eng. Deg. Thesis: Extracting Linear Image Features Using Directional Neighborhood Operators

STUDENTS GRADUATED WITH AN M.SC (THESIS/PROJECT OPTION, MORE THAN 40, SELECTIVE LIST FOLLOWS)

1. Leyla Cahut: *Thesis:* Resolution-Based Environment Mapping Using Sonar Sensors
2. Srinivas Ketha: *Thesis:* CAD/CAM Based Modeling, Analysis and Simulation of a Reconfigurable Robotic Gripper System
3. Timothy Hebert: *Thesis:* Sensor - Based Control of a Robotic Gripper
4. E. Chandra Sekhar: *Thesis:* Identification of Dynamic Parameters of AdeptOne Robot for Model-based Real-time Control
5. Michael Talley: *Thesis:* Real-time Control of a Variable Speed Conveyor Belt for an Object Tracking Robotic System
6. Anita Kishore: *Thesis:* A Graphical User Interface for Systems Modeling Using Colored Petri Nets
7. George Demetriou: *Project:* Simulation Studies of the RAL System with the SILMA Package
8. Majid Altuwaijri: *Project:* Software for Image Processing Algorithms
9. Thomas Larsson: *Thesis:* Stability Analysis of the PUMA-560 Robot Arm with PD and PID Controllers under Model Mismatch
10. Harris Stellakis: *Thesis:* Fuzzy Logic Based Modeling of the Organization Level of Intelligent Robotic Systems
11. Peter H. Yuan: *Thesis:* Design of an Intelligent Robotic System Organizer Via Expert System Techniques
12. Jaswinder S. Ahuja: *Thesis:* Advanced Petri Net Techniques for the Comprehensive Modeling, Analysis and Simulation of Flexible Manufacturing Systems
13. Socrates J. Carelo: *Thesis:* An Efficient Planning Technique for Robotic Systems

PART V

INTERNATIONAL CONFERENCE CHAIR ACTIVITIES

- *General Chair*, 2011 IEEE Multi Systems Conference, September 2011, Denver, CO, USA.
- *Conference Chair*, 16th IASTED International Conference on Robotics and Applications, June 2011, Vancouver, Canada.
- *General Chair*, 2011 IEEE International Conference on Unmanned Aircraft Systems, May 2011, Denver, CO, USA.
- *General Chair*, 3rd International Symposium on Unmanned Aerial Vehicles, Dubai, June 21-25 2010.
- *General Chair*, 1st International Symposium on Unmanned Aerial Vehicles, Orlando, FL, June 2008.
- *General Chair*, (with Dr. W. Gruver) 2008 International Conference on Distributed Human Machine Systems, Athens, Greece, March 2008.
- *General Chair*, (with Dr. Panos Antsaklis) 2007 Mediterranean Conference in Control and Automation (MCCA), Athens, Greece, June 2007.
- *Local Arrangements Chair*, 2006 IEEE International Conference in Robotics and Automation (ICRA 2006), Orlando, FL, USA.
- *Program Chair*, 2004 IEEE International Conference in Robotics and Automation (ICRA 2004), New Orleans, Louisiana.
- *General Chair*, (with Dr. Frank Lewis) 2003 Mediterranean Conference in Control and Automation (MCCA), Rhodes, Greece, June 2003.
- *General Chair*, (with Dr. Zoran Vukic) Mediterranean Conference in Control and Automation (MCCA), Dubrovnik, Croatia, June 2001.
- *U.S. Program Chair*, IEEE Conference on Control Applications (CCA), Trieste, Italy, September 1998.
- *General Chair*, International Advanced Robotics Programme (IARP); International Workshop on Autonomous Underwater Vehicles for Shallow Waters and Coastal Environments, Lafayette, LA, February 1998.
- *General Chair*, IEEE International Workshop on Control Problems in Robotics and Automation: Future Directions, San Diego, CA (CDC venue), December 1997.
- *Registration Chair*, 36th IEEE Conference on Decision and Control (CDC), San Diego, CA, December 1997.
- *Publicity Chair*, IEEE Conference on Computational Intelligence in Robotics and Automation, CIRA'97, Monterey, CA, July 1997.
- *Program Vice-Chair, Robotics*, ICTAI'96, 8th IEEE International Conference on Tools with Artificial Intelligence, Toulouse, France, November 1996.
- *Publicity Chair*, 1996 IEEE International Conference in Robotics and Automation, Minneapolis, MN, April 1996.
- *Local Arrangements Chair*, 34th IEEE Conference on Decision and Control (CDC), New Orleans, LA, December 1995.
- *General Chair*, 10th IEEE International Symposium on Intelligent Control, (ISIC'95) Monterey, CA, August 1995.
- *General Chair*, 2nd IEEE Mediterranean Symposium on New Directions in Control and Automation, Chania, Crete, Greece, June 1994.
- *Local Arrangements and Publications Chair* 1993 Workshop on Computer Architectures for Machine Perception (CAMP'93), New Orleans, LA, December 1993.
- *Vice Program Chair*, 4th International Conference on Tools With Artificial Intelligence, Arlington, VA, November 1992.
- *Program Cochairman*, 4th IEEE International Symposium on Intelligent Control (ISIC '89), Albany

NY, September 1989.

Conference Technical/Scientific Program Committees

- Organizing Committee, *NATO-ASI Advanced All-Terrain Autonomous Systems* Workshop, Cesme-Ismir, Turkey, August 13-24, 2010.
- Networked Robotics, IFAC Workshop, Golden, CO, October 2009.
- Conference on Telecommunications, ConTel 2009, Zagreb, Croatia, June 2009.
- Mediterranean Conference on Control and Automation, Thessaloniki, Greece, June 2009.
- IFAC Conference on Control Applications in Marine Systems, Croatia, September 2007.
- Conference on Telecommunications, ConTel 2007, Zagreb, Croatia, June 2007.
- European Control Conference, Greece, June 2007.
- Mediterranean Conference on Control and Automation, Ancona, June 2006.
- Conference on Telecommunications, ConTel 2005, Zagreb, Croatia, June 2005.
- Mediterranean Conference on Control and Automation, Cyprus, June 2005.
- Conference on Telecommunications, ConTel 2005, Zagreb, Croatia, June 2005.
- IEEE / JRS International Conference on Intelligent Robots and Systems (IROS), Las Vegas, 2003.
- MED'03, Rhodes, Greece, June 2003.
- Conference on Telecommunications, ConTEL 03, Zagreb, June 2003.
- IEEE International Conference on Robotics and Automation, Washington D.C., May 2002.
- 2002 Mediterranean Conference in Control and Automation (MCCA), Lisbon, Portugal, July 2002.
- Conference on Telecommunications, ConTEL 01, Zagreb, Croatia, June 2001.
- IEEE International Conference on Robotics and Automation, San Francisco, April 2000.
- Second World Manufacturing Congress, WMC'99, UK, September 1999.
- 14th IEEE International Symposium on Intelligent Control, Cambridge, MA, August 1999.
- Conference on Telecommunications, ConTEL 99, Zagreb, Croatia, June 1999.
- IEEE International Conference on Robotics and Automation, Detroit, May 1999.
- IEEE/JRS International Conference on Intelligent Robots and Systems (IROS), Canada, October 1998.
- IEEE International Conference on Robotics and Automation, Belgium, May 1998.
- IEEE International Conference on Systems, Man and Cybernetics, Orlando, FL, October 1997.
- Sixth International Conference on Intelligent Systems, Boston, MA, June 1997.
- Fifth IEEE Mediterranean Conference on Control and Systems, Paphos, Cyprus, July 1997.
- Conference on Telecommunications, ConTEL 97, Zagreb, Croatia, June 1997.
- 5th IEEE International Conference on Emerging Technologies and Factory Automation (EFTA 96) / Discrete Event / Hybrid Systems and Control Track, Hawaii, November 1996.
- 11th IEEE International Symposium on Intelligent Control, September 1996.
- Fourth IEEE Mediterranean Symposium on Control and Automation, Chania, Crete, June 1996.
- 1996 IEEE International Conference on Robotics and Automation, Minneapolis, MN, April 1996.
- Third IEEE Mediterranean Conference on Control and Automation, Cyprus, June 1995.
- Conference on Telecommunications, ConTEL 95, Zagreb, Croatia, June 1995.
- IEEE Conference on Systems, Man, and Cybernetics, San Antonio, Texas, November 1994.
- 7th International Conference on Parallel and Distributed Computing Systems, Las Vegas, October 1994.
- 9th IEEE International Symposium on Intelligent Control, August 1994.
- Conference on Telecommunications, Zagreb, Croatia, June 1994.
- Joint IEEE/IFAC Symposium on Computer Aided Control System Design, March 1994.
- 8th IEEE International Symposium on Intelligent Control, August 1993.
- Conference on Telecommunications, ConTEL 93, Zagreb, Croatia, June 1993.
- 7th IEEE International Symposium on Intelligent Control, August 1992.

- VLSI Workshop on Research and Education, Louisiana, April 1992.
- 1991 IEEE International Conference on Robotics and Automation.
- 1991 EURISCON, The European Robotics and Intelligent Systems Conference.
- 6th IEEE International Symposium on Intelligent Control 1991.

Conference Session Chairman (Selective)

- 17th Mediterranean Conference on Control and Automation, Thessaloniki, Greece, June 2009.
- 14th Mediterranean Conference on Control and Automation, Ancona, Italy, June 2006.
- IEEE International Conference on Robotics and Automation, Orlando, FL, May 2006.
- 9th Mediterranean Conference on Control and Automation, Croatia, June 2001.
- Conference on Telecommunications, ConTEL, Zagreb, Croatia, June 1999.
- 1999 IEEE International Conference on Robotics and Automation.
- IEEE/RJS International Conference on Intelligent Robotics and Systems, October 1998.
- 1998 IEEE International Conference on Robotics and Automation.
- Fifth IEEE Mediterranean Conference on Control and Systems, June 1997.
- 1997 IEEE International Conference on Robotics and Automation.
- Fourth IEEE Mediterranean Symposium on New Directions in Control and Automation, June 1996.
- World Automation Congress, ISRAM, France 1996.
- 1996 IEEE International Conference on Robotics and Automation.
- Third IEEE Mediterranean Symposium in Control and Automation, June 1995.
- Third International Conference on Automation, Robotics and Computer Vision, ICARCV '94, Singapore.
- 1994 IEEE International Symposium on Intelligent Control.
- 1994 Joint IEEE/IFAC Symposium on CACSD.
- 1993 IEEE International Symposium on Intelligent Control.
- IEEE Mediterranean Symposium on New Directions in Control Theory and Applications 1993, Crete, Greece.
- 1993 IEEE International Conference on Robotics and Automation.
- 1992 IEEE International Symposium on Intelligent Control.
- 1991 IEEE International Symposium on Intelligent Control.
- 1991 IEEE International Conference on Robotics and Automation.
- 13th IMACS World Congress on Computation and Applied Mathematics, Ireland, 1991.
- 1990 IEEE International Conference on Robotics and Automation.
- 1990 IEEE American Control Conference.
- 1990 SPIE Conference in Intelligent Robotics in Space.
- 1988 IEEE International Conference on Robotics Automation.
- 26th IEEE Conference on Decision and Control, 1987.

EDITORIAL BOARD APPOINTMENTS

- *May 1, 2006* *Editor-in-Chief, Journal of Intelligent and Robotic Systems*
- *1/2006-12/2008:* *Editor, IEEE SMC eNewsletter*
- *January 1996 – 12/2005* *Editor-in-chief, IEEE Robotics & Automation Magazine.*
- *2/ 1996 – 2/1999* *Associate Editor, IEEE Trans. in Robotics & Automation.*
- *10/ 1995 – Present* *Board of Editors, International Journal of Intelligent Control*

Systems.

- *January - December 1995* *Editor Elect*, IEEE Robotics & Automation Magazine.
- *1993 - Present* *Editorial Advisory Board*, International Series on Microprocessor Based and Intelligent Systems Engineering, Kluwer Academic Publishers.
- *1993 - 1995* *Associate Editor*, IEEE Robotics & Automation Magazine.
- *January 1992 – 12/2005* *Book Review Editor*, Journal of Intelligent and Robotic Systems.
- *September 1991 - 1992* *Managing Editor*, Journal of Intelligent and Robotic Systems.
- *Member, Editorial Board*, Journal of Intelligent and Robotic Systems.

GUEST EDITOR / SPECIAL ISSUES

“Unmanned Aerial Vehicles”, *IEEE Robotics and Automation Magazine*, September 2006. Editors, K. P. Valavanis and G. J. Vachtsevanos

“Underwater Robotics Technologies”, *IEEE Robotics and Automation Magazine*, Vol. 6, No. 2, June 1999. Editors: D. Gracanin and K. P. Valavanis.

“Theory and Applications of Intelligent Controls”, *Journal of Intelligent Control and Systems*, World Scientific Publishers, Editors: K. P. Valavanis and F. L. Lewis.

“Discrete Event Systems in Robotics and Automation”, *Journal of Robotics and Autonomous Systems*, Vol. 13, No. 3, October 1994, *Elsevier Science*. Editors: T. Sobh, K. P. Valavanis.

INTERNATIONAL PROGRAM DEVELOPMENT

NSF Funded Workshop Organizer

International Program Development in Undersea Robotics and Intelligent Controls: A Joint U.S./Portugal Effort, Lisbon, Portugal, March 2 – 3, 1995. Researchers and scientists from the US and EEC countries discussed current problems in URIC and started collaboration on specific projects of common interest.

International Advanced Robotics Programme International Workshop on AUVs for Shallow Waters and Coastal Environments, Lafayette, LA, February 1998. (Representatives of nine countries: USA, Russia, China, France, Italy, Germany, Portugal, Croatia, and Greece.)

INTERNATIONAL WORKSHOPS AND TUTORIALS

G. J. Vachtsevanos, K. P. Valavanis, Workshop on “*UAS Civilian Applications: Fire Detection, Forest Protection, Emergency Response*”, 17th Mediterranean Conference on Control and Automation, Thessaloniki, Greece, June 2009.

K. P. Valavanis, G. Vachtsevanos, Tutorial on “*Unmanned Aerial Vehicles*”, 15th Mediterranean Conference on Control and Automation, Athens, Greece, June 2007.

P. Oh, T. Adams, K. Valavanis, Workshop on “*Unmanned Air Vehicles: Payloads and Missions*”, IEEE International Conference on Robotics and Automation, Orlando, FL, May 2006.

P. Oh, K. Valavanis, Tutorial on “*Hands-On Lessons for Unmanned Air Vehicle Construction*”, IEEE International Conference on Robotics and Automation, Orlando, FL, May 2006.

G. Vachtsevanos, K. P. Valavanis, Tutorial on “*Unmanned Aerial Vehicles: Enabling Technologies and Roadmap for Autonomy*”, IEEE International Conference on Robotics and Automation, New Orleans, April 2004.

G. Vachtsevanos, K. P. Valavanis, N. C. Tsourveloudis, Workshop on *Unmanned Aerial Vehicles*, 11th Mediterranean Conference on Control and Automation, Rhodes, Greece, June 2003.

K. P. Valavanis, I. Lovrek, “*Agents and Agent-Based Systems*”, Tutorial Workshop No. 1, Conference on Telecommunications, (ConTEL’ 2001), Zagreb, Croatia, June 2001.

L. Acar, K. P. Valavanis, H. R. Berenji, “*Intelligent Control with Applications*”, Tutorial Workshop No. 1, 31st IEEE Conference on Decision and Control, Tucson, AZ, December 1992.

K. P. Valavanis (organizer), “*Theory and Applications of Intelligent Control Systems*” 1991 IEEE American Control Conference, Tutorial Workshop No. 2, June 1991.

K. P. Valavanis, “*Robotics and its Applications*”, Higher Technological Institute, Nicosia, Cyprus, May 1991.

K. P. Valavanis, “*Intelligent Robotic Systems: Theory, Design and Applications*”, IEEE International Conference on Robotics and Automation, Workshop S2, April 1991.

K. P. Valavanis, “*Intelligent Robotic Systems*”, National Technical University of Athens, Greece, March 1990.

CONFERENCE INVITED SESSIONS

- T. Sobh, K. P. Valavanis, “*Discrete Events and Hybrid Systems in Robotics and Automation*”, Proceedings of IROS '95, Pittsburgh, PA, August 1995.
- G. J. Vachtsevanos, K. P. Valavanis, “*Intelligent Control: Applications in Robotics and Manufacturing I*”, Proceedings of the 30th IEEE Conference on Decision and Control, Brighton, England, December 1991.
- G. J. Vachtsevanos, K. P. Valavanis, “*Intelligent Control: Applications in Robotics and Manufacturing II*”, Proceedings of the 30th IEEE Conference on Decision and Control, Brighton, England, December 1991.

PROFESSIONAL SOCIETY MEMBERSHIPS & ACTIVITIES

- Fellow, Member, AAAS
- Senior Member, IEEE.

- IEEE Robotics and Automation Society; Co-Chair, Discrete Event Dynamic Systems (DEDS) Technical Activities Committee (1993 -1995).
- IEEE Society Memberships: Control Systems Society, IEEE Robotics and Automation Society, Computer Society, SMC Society, Oceanic Engineering Society.
- Sigma Xi (1986-1995).
- New York Academy of Sciences (. – 1996)
- International Service Robot Association (IRSA).
- Robotic Industries Association (RIA).
- UL at Lafayette Sigma Xi Club: Secretary 1992-93.

REVIEWER: IEEE Control Systems Society, IEEE Robotics and Automation Society, IEEE Automatic Control Transactions, IEEE Transactions on Systems, Man and Cybernetics, IEEE Computer Magazine, Journal of Intelligent and Robotic Systems (JINT), Journal of Robotic Systems, IEEE Robotics and Automation Conference, IEEE Conference on Decision and Control, IEEE American Control Conference, IEEE Conference on Systems, Man and Cybernetics, NSF.

SELECTED INVITED PRESENTATIONS, KEYNOTE ADDRESSES & SEMINARS

Briefings

- FAA, SAIC, US SOCOM, SPAWAR, ARL, NRL
- Hillsborough County (Tampa)
- SRI, Innova Holdings, Inc.
- QTSI, Concurrent Technologies Corporation

Keynote Addresses

- 11th IASTED Conference, Orlando, FL, November 2008
- Conference on Telecommunications, ConTel 2005, Zagreb, Croatia, June 2005
- NRL Workshop, Washington D.C., February 2004 – Invited presentation
- 1st IEEE Latin American Robotics Symposium, LARS 2004, Mexico City, October 2004.
- 4th IFAC Conference on Maneuvering and Control of Marine Craft, Brijuni, Croatia, September 1997.

Invited talks / Seminars

Air Force Academy, Colorado
 University of Wyoming
 Colorado School of Mines
 University of Colorado, Denver
 University of Notre Dame, IN
 University of Denver, Denver, CO.
 University of Bridgeport, CT
 New Jersey Institute of Technology, NJ
 Drexel University, Distinguished Lecturer Series
 Boeing / American helicopter Society, Philadelphia, PA
 University of Texas at Arlington, Distinguished Lecturer Series (twice)
 University of Ancona, Italy (short courses)
 Technical University of Crete
 British Aerospace Systems (BAES), UK
 University of Lancaster, UK (several seminars)
 11th Cretan Medical Conference, November 2001, Greece

Bertinoro, Italy: Ph.D. Summer School organized by the University of Ancona
University of South Florida
Georgia Institute of Technology (May 9-10, 2002)
Texas A&M University (2002)
University of New Orleans (2002)
University of Louisiana at Lafayette (2002)
EURO UVS Meeting, Paris, France
WEAG Meeting, Brussels, Belgium
University Carlos III of Madrid, Spain
University of Maribor, Faculty of EE and CS, Maribor, Slovenia.
National Science Foundation, Division of ECS.
Technical University of Vienna, Austria.
LA Board of Regents Speaker, "Speaking of Science" (SoS) program.
Technical University of Crete, Greece (Several seminars).
University of Patras, Greece (Several seminars).
University of Zagreb, Croatia (Several Seminars).
Rensselaer Polytechnic Institute, NY.
Georgia Institute of Technology, GA, *Distinguished Lecturer Series in Systems and Control*
Rice University, TX.
Drexel University, PA.
University of Windsor, Canada.
University of Hull, United Kingdom.
National Technical University of Athens (NTUA), Greece (Several seminars).
University of Twente, The Netherlands (Several seminars).
Higher Technological Institute, Nicosia, Cyprus (Several seminars).
Analog Devices Company, MA.
SolidTech Company, CA.