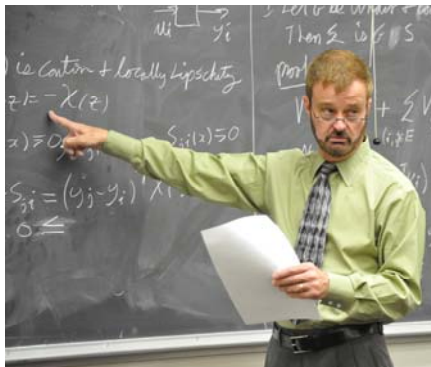


Moncrief-O'Donnell
Endowed Chair
2011 Annual Report



F. L. Lewis, Ph.D., Moncrief-O'Donnell Endowed Chair
Fellow IEEE, Fellow IFAC
Fellow U.K. Inst. Meas. & Control
Prof. Engineer Texas, Chartered Eng. UK Eng. Council
University Distinguished Scholar Professor
The Automation and Robotics Research Institute
The University of Texas at Arlington



The **Moncrief-O'Donnell Endowed Chair in Robotics** was filled in October of 1990 with the hiring of Dr. Frank L. Lewis. Dr. Lewis established the Advanced Controls and Sensors Group (ACS) of the Automation and Robotics Research Institute immediately on his arrival.

ACS PROGRAM OVERVIEW

The ARRI Advanced Controls and Sensors (ACS) Group consists of Dr. Lewis, 8 Ph.D. students, masters and undergraduate students, and often international visiting research faculty. The primary thrusts of ACS are research in controls design for robotic, aerospace, and autonomous systems, intelligent control, cooperative control of networked teams, sensor networks, and real-time control implementation.

Lewis has graduated 39 PhD students. Most of these students have won international and local awards for their work, and several have written books and received US patents. Three are NSF Career Awardees and one is a Dept. of Homeland Security Career Awardee.

Best Application Paper Award

received at Asian Control Conference, Taiwan, May 2011, for our work on Technology Transfer of ARO grant results to Industry.

Chee Kiang Pang, J.H. Zhou, Z.W. Zhong and F.L. Lewis, "Industrial Fault Detection and Isolation Using Dominant Feature Identification."



NSF Funding Received

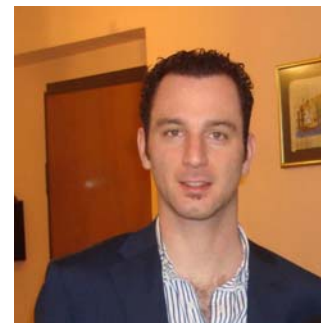
ACS has received 75 competitive research grants since 1990. Lewis has been continually funded by NSF since 1982 and has current funding from three government agencies. A new NSF grant was received this year. Current funding:

National Science Foundation (NSF) Grant. F.L. Lewis, "Adaptive Dynamic Programming for Real-Time Cooperative Multi-Player Games and Graphical Games," NSF Grant, \$272,000 for 3 years, July 2011.

US Army Research Office (ARO) Grant. \$360,000, 2005-2011, for Decision and Control in networked teams of humans and autonomous robots.

Air Force Office of Scientific Research (AFOSR) Grant. \$250,000, 2009-2012, for research in trust establishment in networked man/ machine teams, and how trust impacts distributed decision and control.

PhD Student Graduates



Dr. Kyriakos Vamvoudakis graduated this year. He wrote 5 journal papers and 11 conference papers. He is writing a book and filing a patent with Draguna Vrabie, who graduated last year.

Best Paper Award

Dr. Kyriakos Vamvoudakis and Dr. Lewis received the Best Paper Award for Autonomous/Unmanned Vehicles at the 2010 Army Science Conference. The photo features Dr Vamvoudakis, coauthors Dariusz Mikulski and Dr. Greg Hudas from TARDEC, Dr. Marilyn Freeman, Deputy Assistant Secretary of the Army, and U.S. Army Chief Scientist Dr. Scott Fish (on right).

Award-Winning Research Keeps Soldiers Safe, Effective



By Chris Williams

Top Cited Journal Papers

Three of our journal papers were listed as among the most cited papers in their journals:

Automatica, Shuai Liu, L. Xie, and F.L. Lewis, paper on cooperative control.

IEEE Trans. Systems, Man, and Cybernetics, Part B, A. Al-Tamimi, M. Abu-Khalaf, and F.L. Lewis, paper on adaptive critic control.

Automatica, K.G. Vamvoudakis and F.L. Lewis, paper on actor-critic adaptive control.

International Invited Lectures and Workshops

Lewis was invited to deliver Plenary Talks and Workshops internationally:

Plenary Speaker, IFAC Workshop on Adaptation and Learning in Control, Antalya, Turkey, August 2010.

Invited Tutorial, Int. Symp. ADP and Reinforcement Learning, Paris, April 2011.

Invited Speaker, Chinese Academy of Sciences, "Reinforcement Learning for feedback control, Beijing, May, 2011.

Plenary Speaker, ISA, "Approximate dynamic programming and cooperative control," Wuhan, China, May 2011

Plenary Panel Chair, Int. Symposium on Neural Networks, "Future directions of neural networks," Guilin, China, May 2011.



UTA Workshop on Successful Research and Student Mentoring

We ran a workshop on mentoring graduate students at UTA in October 2010. At this workshop, we discussed philosophies and methods for building a successful career in academic research through mentoring of graduate students.

"Our students are the energy that fuels our excitement as faculty members. Without PhD students it is difficult for faculty to do successful research. Without students we cannot be fully developed as teachers. As faculty members, each of us effectively runs our own small business which includes generating business ideas, developing funding, and building successful teams."

DFW LOCAL IMPACT

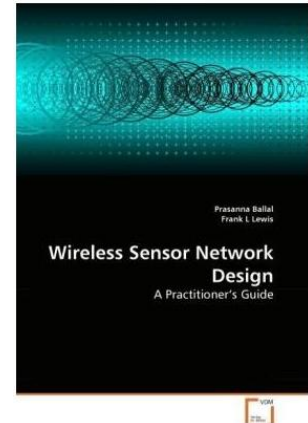
Leadership in the Local Scientific Community

ACS has contributed to the reputation within the scientific community of both UTA and Dallas/Ft. Worth. Lewis is listed in the Ft. Worth Business Press top 200 Leaders. He served as Founding Chairman of the DFW IEEE Control Systems Chapter, which won the national IEEE best chapter award in 1994. He was selected as Fort Worth Engineer of the Year by the IEEE Section in 1995. He received the IEEE Region 5 Outstanding Engineering Educator Award in 2010.

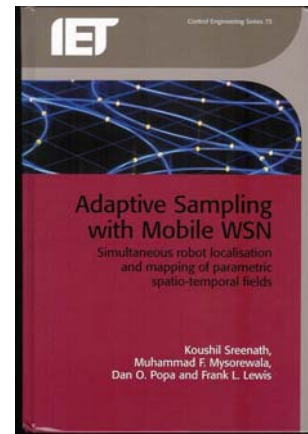
We have received significant funding from NSF, AFOSR, ARO, Texas State, and the DoD SBIR program to work with local and national industry. This has enhanced the competitiveness of DFW and U.S. companies in the area of feedback control systems, automation, MEMS, and Wireless Sensor Networks.

Three Books Published This Year

Prasanna Ballal graduated in 2008. His work at UTA on wireless sensors was published as a book this year.



Koushil Sreenath graduated in 2005. His work at UTA on sampling using sensor networks was published as a book this year.



Dr. C.K. Pang of National University Singapore visited Dr Lewis for joint research for a year in 2009. His book was published this year.

