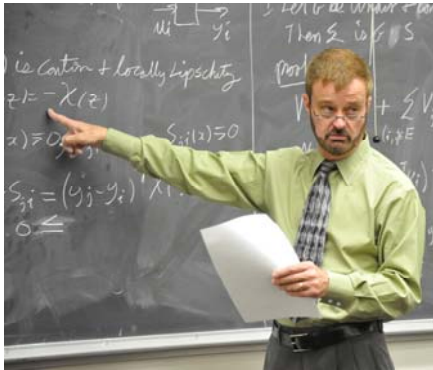


Moncrief-O'Donnell  
Endowed Chair  
2014 Annual Report

F. L. Lewis, Ph.D., Moncrief-O'Donnell Endowed Chair  
National Academy of Inventors  
Fellow IEEE, Fellow IFAC  
Fellow U.K. Inst. Meas. & Control  
Prof. Engineer Texas, Chartered Eng. UK Eng. Council  
University Distinguished Scholar Professor  
University Distinguished Teaching Professor  
Texas State Regents' Outstanding Teaching Professor  
UTA Research Institute, University of Texas at Arlington  
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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 UTA Research Institute immediately on his arrival.

**ACS PROGRAM OVERVIEW**

The UTARI Advanced Controls and Sensors (ACS) Group consists of Dr. Lewis, 5 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 44 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.

**Reza Modares and Bahare Kiumarsi**



Reza and Bahare are among the top performing PhD students ACS has ever had. Their research is at the heart of modern reinforcement learning control theory and their productivity is astounding. Since coming to UTA, Reza has 9 journal papers accepted and Bahare has 2 accepted. Reza and Bahare are married.

**New Funding of \$448K**

ACS has received 80 competitive research grants since 1990 for a total of more than \$9M. Lewis has been continually funded by NSF since 1982.

**Last year Lewis garnered new funding of \$655K from US Army TARDEC, Navy ONR, Air Force AFOSR. In these 2 years his new funding level is \$1.1 million.**

New Funding Received this Year-

**\$370,513 from National Science Foundation.** With Ali Davoudi, Electrical Engineering Department and Dan Levine, Psychology Dept.. "New Adaptive Dynamic Programming Structures From Neurocognitive Psychology and Graphical Games,"

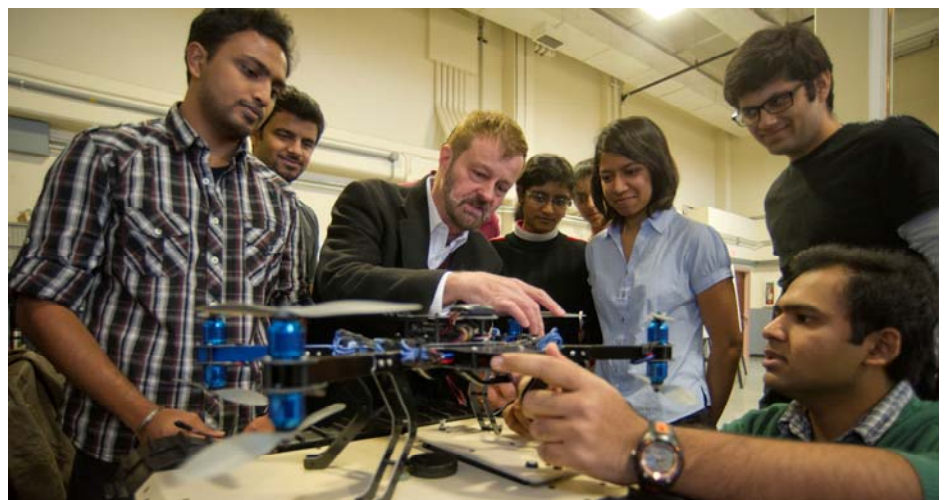
**\$77,000 from Office of Naval Research.** The Principal Investigator on this grant is Ali Davoudi, EE Dept. "Distributed Decision-making for Shipboard Electric Power Microgrids."

**Election to National Academy of Inventors**

This year Dr. Lewis was elected as Fellow, National Academy of Inventors. Election to NAI is a high professional distinction accorded to academic inventors who have demonstrated a highly prolific spirit of innovation in creating inventions that have made a tangible impact on the welfare of society. In the 1990s Lewis developed an improved adaptive control technology based on neural networks that delivers improved performance of autonomous systems. His controller is used by Boeing in the Phantom Ray and other aerial systems.

**UTA Academies**

Dr Lewis is a both a member of the UTA Academy of Distinguished Teachers and a Charter Member of the UTA Academy of Distinguished Scholars.



## Top Ranked Students

### UTARI ACS Former Students Are Now World Leaders

Kadri Ozcaldiran, President, Bosphorus University, Turkey, 2007-2012

Chaouki Abdallah, Provost, University of New Mexico

Vassilis Syrmos, Vice Chancellor for Research, Hawaii University System

Asma Al-Tamimi, Chairman, Department of Electrical Engineering, Hashemite University, Jordan

Draguna Vrabie, Senior Scientist, United Technologies Research Center, East Hartford, Connecticut

Murad Abu-Khalaf, Executive Director, Kuwait-MIT Center for Natural Resources.

## China Qian Ren Thousand Talents Award

This year Dr. Lewis received the Qian Ren Thousand Talents Award from the Chinese Research Council. He works with the State Key Lab in *Synthetic Industrial Process Control* in Northeast University, Shenyang, China. The Qian Ren is among the highest honors awarded by China to academic research investigators.



## International Invited Lectures

Lewis delivered 6 International Invited and Plenary Talks this year:

Plenary Speaker, Conference on Advanced Mechatronic Systems, Kumamoto, Japan.

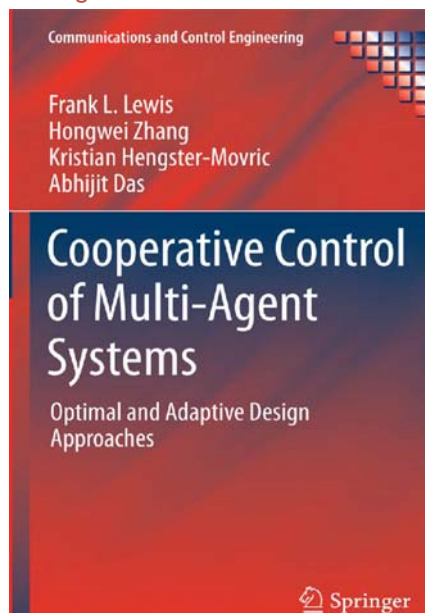
IEEE Distinguished Lecturer, Prague, Czech Republic.

Plenary Speaker, Conference on Intelligent Computing, Taiyuan, China.

Invited Speaker, Dept. of Electrical & Computer Engineering, Univ. of Central Florida.

## 2014 New Book

We published a new book about cooperative synchronization in connected multi-agent systems. These techniques have applications in coordination of multiple renewable energy resources in a power grid. We received new funding from ONR of \$77K (Ali Davoudi as PI) to apply these methods to shipboard power microgrids.



## Editor of Major Book Series on Automation & Control

### International Research Leadership

Lewis is Editor in Chief of the Taylor & Francis/CRC Press Book Series on Automation & Control Engineering. This series focuses on publishing application-oriented quality textbooks and research monographs in the broad area of automation and control engineering to facilitate transition of research to engineering practice.

## PhD Student Graduates

Lewis has graduated 44 PhD students, many of whom have won national or international awards. This year, 1 PhD student graduated.

Ali Bidram, coadvised with Dr. Ali Davoudi in UTA Dept. of EE as main adviser. *Cooperative control for electric power micro-grid.*

***Bidram received the N. M. Stelmakh outstanding student research award, UTA Dept. of Electrical Engineering.***



Ali Bidram, PhD in Aug. 2014

## New Patent Filed

We have received 6 US patents. We filed a new patent this year about our research on using cognitive psychology methods for online learning of feedback control systems. These systems have guaranteed stability, give good control performance, and minimize energy and fuel.

K. Vamvoudakis, D. Vrabie, and F.L. Lewis, "Control methodology for online adaptation to optimal feedback controller using integral reinforcement learning," patent applied for, Application 13/715,116.

## New Online Master's Degree in Systems and Control

### Academic Leadership at UTA

This year we started a new online Master's Degree in Systems and Controls. This degree is offered through the Department of Electrical Engineering. Off campus students can now obtain a MS degree in EE completely through the online experience.