



November 3, 2009

The Honorable Jerome B. Abrams  
Scott County District Court  
200 Fourth Avenue West  
Shakopee, MN 55379

*VIA FACSIMILE ONLY*  
*(952) 496-8211*

Re: Source Code Status Conference November 4, 2009

Dear Judge Abrams:

You Honor has scheduled a hearing on November 4, 2009 to review the status of numerous Source Code cases pending within the First District.

As the Court is aware, the Minnesota Society for Criminal Justice (MSCJ) is coordinating a coalition of hundreds of private attorneys and public defenders to conduct one analysis of the Source Code at CMI headquarters in Kentucky.

The MSCJ has established a Source Code committee of approximately twelve attorneys, who meet regularly to monitor and direct the analysis.

The committee has designated attorneys Jeff Sheridan, Chuck Ramsey and I to speak on behalf of the Coalition on November 4<sup>th</sup>. To assist the Court, we are supplying the following information in advance.

MSCJ has retained Computer Forensic Services, Inc. of Minnetonka, Minnesota to evaluate the CMI, Inc. Intoxilyzer 5000EN in use by the State of Minnesota. The purpose of the evaluation is to verify and validate whether or not it correctly determines blood alcohol content when provided breath samples by real people.

Computer Forensic Services (CFS) has a team of subject matter experts, who have experience with embedded systems, toxicology, and data management. These experts will perform a complete and in-depth analysis and review of the Intoxilyzer 5000EN Source Code currently in use in the State of Minnesota. This team will complete its review through off-site document analysis, data analysis, and photographic analysis at the Computer Forensic Services lab, and through on-site analysis at CMI's headquarters in Owensboro, Kentucky.

Mark Lanterman and Matt Willis of CFS are coordinating the analysis. Other employees from CFS will also be involved. Dr. Karl Schubert will be conducting the main portion of the analysis and review at CMI headquarters. The Coalition has also retained Glenn Hardin and Haley Myler to examine hardware issues. Resumes and curriculum vitae are attached.

We hope to obtain CMI's full cooperation in making this analysis go smoothly. There may, however, be issues of disagreement on what is needed for proper analysis and how to resolve these disputes. One example of a dispute is the amount of redaction that has occurred in the printed version of the Code supplied to the Coalition. CMI asserts that 100 pages of redaction is necessary and proper within the terms of the Federal Settlement. The Coalition is concerned that such a large amount of redaction is not necessary. The Coalition is reserving that issue and is proceeding with the on-site analysis.

This past week an attorney for CMI and I exchanged names of contact people who will handle routine scheduling and logistic issues at CMI. We anticipate two of our experts, Matt Willis and Karl Schubert, will arrive at CMI's headquarters to begin the analysis on approximately November 16, 2009.

The project is expected to last from two to three months. This assumes that CMI provides quality information and cooperates. In that regard, CFS will require complete (non-redacted) access to the following items

1. The entire Source Code, compile and build time scripts and directives in softcopy.
2. All build files, assembler, compiler, linker, and related materials in softcopy.
3. All libraries and files for assembly and compiling files and scripts for assembly and compiling, along with the actual assembler and linker.
4. All compiled and linked HEX files, loaded EPROMs, actual calibration data, and a COBRA system.
5. A computer for processing.
6. A fully functional instrument.
7. Additional source materials, such as the schematics, compile, and run-time patches, and any modifications to the compiled Code installed in the device.

Mark Lanterman from CFS will be present at the November hearing to address any technical issues that the Court may have. The September 30th letter of Mr. Lanterman had been written to the Court to clarify an important nuance regarding the roles of the experts. That is, the experts are employed by the Coalition itself and not the individual attorneys of the Coalition.

In compliance with Judge Frank's order, CFS is planning to bring two computers on-site. One will house the Source Code and contain the analysis tools and will not have connectivity or removable drives. It will remain at their facility and the hard drive will eventually be destroyed onsite<sup>1</sup>. The other computer will be for note taking. As it will not have the Source Code loaded onto it, that computer will travel with our experts, may have connectivity and removable drives and will not be inspected or handled by CMI. I expect our experts will also take written notes that will not be inspected or handled by

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<sup>1</sup> Judge Frank's order notes that "No portion of the Source Code shall be copied verbatim except as necessary for meaningful expert review." Whether or not any defects are discovered will affect if a portion of that code will need to be electronically copied for meaningful expert review.

CMI.

CFS will be preparing a report at the end of the analysis. However, if individual attorneys wish to have the experts testify in individual hearings, they will need to retain the experts on an individual basis. The members of the Coalition have again been reminded of that fact.

As to the possibility for one large Frye Mack hearing, the Coalition takes the position that we are supportive of one large Frye Mack hearing in concept. Attached is a letter from the Supreme Court Commissioner and my office.

If that consolidation is possible is a matter of debate. We would encourage an informal meeting of the various players to brainstorm about the possibility of such a hearing and the guidelines that would need to be established.

If significant defects in the Code exist, that report would be issued outlining those concerns. We would then make such a report available to the Government.

The point that needs to be remembered is that the parties are engaged in reviewing computer Code, the exact structure of which should not be debatable. This is not a subjective review. It is a scientific review of data and how a program operates. Errors, if they exist, should be reviewable and repeatable.

We assume the Government is putting together its own team to review the Code. We are not aware of who those individuals are, their credentials or the status of coordinating this review on behalf of all the Government entities involved. We would appreciate receiving some update at the hearing on the Government's position on these matters.

The need and structure for discovery is unclear at this time based upon the lack of knowing what problems, if any, exist with the Code. Depositions may be necessary

We hope this general information is of value to the Court and we are happy to address any other issues at our upcoming hearing.

Respectfully,

MSCJ Source Code Coalition

  
Marsh J. Halberg

cc: Attorney General's Office (via facsimile – 651-297-4077)  
Scott County Attorney (via facsimile – 952-496-8775)  
Carver County Attorney (via facsimile – 952-361-1413)  
Dakota County Attorney (via facsimile - 651-438-4500)



November 3, 2009

The Honorable Eric J. Magnuson  
Chief Justice  
Supreme Court of Minnesota  
Minnesota Judicial Center  
25 Rev. Dr. Martin Luther King, Jr. Blvd.  
St. Paul, MN 55155

Re: Source Code Review

Dear Chief Justice Magnuson:

I have been copied with previous letters sent to you from Judge Gearin, Supreme Court Commissioner Richard Slowses and the Public Defenders Office.

I have been authorized by the Minnesota Society for Criminal Justice (MSCJ) to confirm with you that the MSCJ is interested in discussing a statewide Frye Mack process for both criminal and/or implied consent cases. Should the idea have further merit, we would be happy to meet with the various players involved to brainstorm about possible options.

As the Court may be aware, there is a large hearing scheduled before Judge Abrams in the First District tomorrow, where this topic may also be discussed.

Please feel free to contact me on behalf of the MSCJ should there be any other questions regarding this matter.

Sincerely,

HALBERG CRIMINAL DEFENSE

  
Marsh J. Halberg

cc: Richard S. Slowses, Supreme Court Commissioner  
Alan I. Gilbert, Solicitor General  
William A. McNab, Esq.  
John Stuart, State Public Defender  
Rex Tucker, Chief Public Defender-Seventh Judicial District  
Janelle Kandall, President, Minnesota County Attorney's Association  
Thomas L. Grundhoefer, Minnesota League of Cities  
Charles Ramsey, Esq.



RECEIVED  
OCT 26 2009

THE SUPREME COURT OF MINNESOTA  
MINNESOTA JUDICIAL CENTER  
25 REV. DR. MARTIN LUTHER KING JR. BLVD.  
SAINT PAUL, MINNESOTA 55155

RICHARD S. SLOWES  
COMMISSIONER

October 23, 2009

(651) 296-6125

Chief Judge Kathleen Gearin  
1210 Ramsey County Courthouse  
15 West Kellogg Boulevard  
St. Paul, Minnesota 55102

Dear Chief Judge Gearin:

I am responding to your September 30, 2009, letter to Chief Justice Eric J. Magnuson. On behalf of the chief judges of the state, you request that the chief justice appoint one judge to hear any pretrial evidentiary issues involving the reliability and accuracy of Intoxilyzer 5000 test results in civil Implied Consent cases and criminal DWI cases. The chief justice has received letters commenting on your request from Solicitor General Alan Gilbert, counsel for the Commissioner of Public Safety, attorney Marsh Halberg, a member of the "Source Code Coalition," William McNab, counsel for the Intoxilyzer 5000 manufacturer, and most recently, Rex Tucker, Chief Public Defender for the Seventh Judicial District on behalf of the state public defenders.

As you note, Minn. Gen. R. Prac. 113 establishes a procedure through which the chief justice may appoint a single judge to hear cases that are pending in more than one judicial district where there is a need for central judicial management. The rule provides that a request for an appointment can come from a judge, as well as by motion of a party. Even where the request for appointment is made by a judge, it is preferable that the request be made in the context of specific pending cases. This facilitates using the procedure prescribed in the rule to define the role of the appointed judge, and helps insure that appropriate notice and opportunity to respond to the request is provided to counsel for the affected parties.

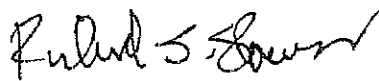
You also correctly note that Rule 113 is applicable only to civil cases, and appointment of a single judge for criminal cases may raise constitutional considerations. Chief Public Defender Rex Tucker raises due process concerns and conflicts with the Rules of Criminal Procedure in his letter opposing a single "evidentiary" court. To the extent there is a desire for appointment of a single judge to manage some aspect of these matters, evidentiary, procedural, or logistical, for criminal cases, even though Rule 113 does not apply it would be preferable for the request to be made by motion or petition in the context of actual criminal cases so that there is an opportunity for the parties to address the scope of issues to be assigned to the single judge and to formally raise any objections, constitutional or otherwise.

Chief Judge Kathleen Gearin  
October 23, 2009  
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I recognize that there are likely many hundreds of cases potentially affected by such an appointment and joining all such cases in a request/motion may not be practicable. Whether and to what extent notice is required for all such cases, whether civil or criminal, would be an issue that could be addressed in proceedings on a motion/request in the context of some actual pending cases.

I realize this is a significant logistical issue for the courts and litigants. I hope this letter provides some assistance in pursuing a resolution. Please feel free to contact me if you have any questions.

Sincerely,



RICHARD S. SLOWES  
Supreme Court Commissioner

RSS:dlj

cc: Alan I. Gilbert, Solicitor General  
Marsh J. Halberg, Minnesota Society for Criminal Justice Source Code Coalition  
William A. McNab  
John Stuart, State Public Defender  
Rex Tucker, Chief Public Defender-Seventh Judicial District  
Janelle Kandall, President, Minnesota County Attorney's Association  
Thomas L. Grundhoefer, Minnesota League of Cities  
Charles Ramsey ✓

# GLENN G. HARDIN CURRICULUM VITAE

## EDUCATION

Bachelor of Science in Chemistry  
University of California, Berkeley, California, 1984

Master of Public Health in Forensic Science  
University of California, Berkeley, California, 1988

## PROFESSIONAL EXPERIENCE

**Forensic Toxicologist**, The Tox Group, St. Paul, MN, 2007-Present. Interpret alcohol and drug tests and the effects of alcohol and drugs on human performance, behavior, and memory.

**Professor of Practice in the Forensic Sciences**, Hamline University, St. Paul, MN, 2008-Present. Responsible for designing and delivering a curriculum for the forensic sciences program.

**Scientific Director**, RSI Laboratories, Minneapolis, MN, 2008-Present. Responsible for providing project management and technical direction for the forensic drug testing (FDT) laboratory.

**Toxicology Supervisor**, Minnesota Bureau of Criminal Apprehension, Forensic Science Laboratory, St. Paul, MN, 1998-2008. Provided project management and technical direction for the blood alcohol, drug, and breath-alcohol testing sections.

**Adjunct Associate Professor**, Graduate Toxicology Program, University of Minnesota, St. Paul, MN, 2002-2006. Designed and delivered a series of lectures on the forensic aspects of alcohol and drugs.

**Forensic Scientist**, Toxicology Section, Minnesota Bureau of Criminal Apprehension, Forensic Science Laboratory, St. Paul, MN, 1989-1998. Tested blood and urine samples for alcohol and drugs.

## CERTIFICATIONS

Diplomate, American Board of Forensic Toxicology (DABFT)  
Toxicological Chemist, National Registry of Certified Chemists (1991-2006)

## AFFILIATIONS

American Academy of Forensic Sciences  
Society of Forensic Toxicologists  
International Association for Chemical Testing

## PUBLICATIONS

Zittel, DB, Hardin, GG. Comparison of blood ethanol concentrations in simultaneously collected expired and unexpired venipuncture tubes. *J Anal Toxicol*, 2006; 30 (5): 317-318.

Sreerama L, Hardin GG. Improper sealing caused by the Styrofoam integrity seals in leakproof plastic bottles lead to significant loss of ethanol in frozen evidentiary urine samples. *J Forensic Sci*, 2003; 48 (3): 672-676.

Hardin GG. Postmortem blood and vitreous humor ethanol concentrations in a victim of a fatal motor vehicle crash. *J Forensic Sci*, 2002; 47(2): 402-403.

Inman K, Hardin G, Sensabaugh GF, Thornton JI. Concerning the solubility of sugar in gasoline. *J Forensic Sci*, 1993; 38: 757.

Borgias BA, Hardin GG, Raymond KN. Characterization and structure of  $[H_3O_7]^+$   $[As(catecholate)_3]^-$  p-dioxane. *Inorg Chem*, 1986; 25: 1057-1060.

## SCIENTIFIC PRESENTATIONS

Fuller KM, Stoll DR, Steinkraus LD, Pasha MS, Hardin GG, Carr PW. Fast gradient elution liquid chromatography for rapid screening of drugs of abuse in blood. Presented at the Annual Meeting of the Society of Forensic Toxicologists, 2005.

Sreerama L, Janski S, Ford SJ, Dempich JC, Weatherson H, Hardin GG. Influence of common work-place/industrial organic solvents and their formulations (interferents) present in simulated breath samples on ethanol quantitative analysis by Intoxilyzer<sup>®</sup> 5000EN (Series 68-01). Presented at the Annual Meeting of the American Academy of Forensic Sciences, 2001

Hardin GG. Postmortem blood and vitreous humor ethanol concentrations in a victim of a fatal motor vehicle crash: A case report. Presented at the Annual Meeting of the American Academy of Forensic Sciences, 2001

Sreerama L, Nelson JK, Meyer RF, Hardin GG. Influence of sodium fluoride (NaF) concentration on quantitative analysis of ethanol by headspace gas chromatography (HSGC) in urine samples. Presented at the Annual Meeting of the Society of Forensic Toxicologists, 2000

Sreerama L, Gallagher S, Pulju P, Hardin GG. Comparison of ethyl alcohol concentrations in simultaneously collected blood breath and urine samples: A field study. Presented at the Annual Meeting of the Society of Forensic Toxicologists, 2000

Sreerama L, Ukestad EL, Meyer RF, Hardin GG. Comparison of ethyl alcohol concentrations in simultaneously collected from blood, breath, and urine samples. Presented at the Annual Meeting of the American Academy of Forensic Sciences, 2000.

Hardin GG, Klaus SN. Evaluation of STC micro-plate EIA for drugs of abuse testing in whole blood: Comparison of manual method and the PersonalLAB™ automated immunodiagnostic analyzer. Presented at the Annual Meeting of the American Academy of Forensic Sciences, 2000.

Jejurikar SG, Hardin GG, Williams LM, Winger NR, Meyer RF. Evaluation of STC EIA cannabinoid and cocaine metabolite micro-plate assays in whole blood. Presented at the Annual Meeting of the American Academy of Forensic Sciences, 1997

Jejurikar SG, Hardin GG. DWI forensic blood and urine alcohol quality control in Minnesota. Presented at the Annual Meeting of the Society of Forensic Toxicologists, 1996

Hardin GG, Meyer RF, Jejurikar SG. Corroboration study—a comparison of DRE opinions and toxicology evaluations of impaired drivers in Minnesota. Presented at the Annual Meeting of the Society of Forensic Toxicologists, 1993

Hardin GG. Properties of illegal drug precursors. Presented at the Semi-Annual Meeting of the California Association of Criminalists, 1988

### **INVITED LECTURES**

"Forensic Toxicology in Minnesota," Bethel University, January 2008

"Forensic Aspects of Alcohol", Minnesota New Judges Orientation, October 2007

"Forensic Aspects of Alcohol", Criminal Justice Institute, Minnesota State Bar Association, August 2007

"The Intoxilyzer", Minnesota State Bar Association, April 2007

"Forensic Aspects of Alcohol", Ramsey County Bar Association, February 2007

"Forensic Aspects of Alcohol", Minnesota State Bar Association, January 2007

"Forensic Toxicology in Minnesota," Bethel University, January 2007

"Alcohol Testing and the Intoxilyzer," Minnesota Judges Conference, November 2006

"DWI: Forensic Considerations," Minnesota County Attorney's Association, October 2006

"Alcohol Testing and the Intoxilyzer," Minnesota New Judges Orientation, May 2006

"Forensic Toxicology in Minnesota," Bethel University, January 2006

"Minnesota Toxicology Services," Minnesota DRE Recertification Course, January 2006

"Forensic Toxicology in Minnesota," Bethel University, 2005

"Minnesota Toxicology Update," Minnesota DRE Recertification Course, 2004

"Alcohol Pharmacology and Toxicology," On-Site Testing/180 Degrees, 2004  
"Alcohol and the Intoxilyzer," Minnesota New Judges Orientation, 2004  
"Toxicology Services," Minnesota DRE Recertification Course, 2003  
"Alcohol and the Intoxilyzer," Minnesota New Judges Orientation, 2003  
"Alcohol Testing Issues," Minnesota County Attorneys Association, 2003  
"Forensic Toxicology in Minnesota," University of Minnesota, 2003  
"Alcohol and the Intoxilyzer," Minnesota Judicial College, 2002  
"Alcohol and the Intoxilyzer," Minnesota New Judges Orientation, 2002  
"Aspects of Forensic Toxicology," University of Minnesota, 2001  
"Examination of the Scientific Expert Witness," Robbins, Kaplan, Miller & Ciresi, 2001  
"Analysis of Whole Blood for Drugs of Abuse Using STC Micro-plate Enzyme Immunoassay," American Academy of Forensic Sciences, February 2000  
"Proving Impairment—Alcohol," Minnesota County Attorneys Association, 2000  
"Forensic Toxicology: Some Considerations," St. Cloud State University, 2000  
"Alcohol Pharmacology and Toxicology," Minnesota County Attorney's Association, 1999  
"Minnesota Forensic Alcohol Program," Minnesota Chromatography Forum, 1998  
"Toxicology of Drugs of Abuse," Minnesota DRE Recertification Course, 1995

### **PROFESSIONAL TRAINING**

Clinical Chemistry and Forensic Toxicology, American Academy of Forensic Sciences, 2003  
Antipsychotic Drugs, American Academy of Forensic Sciences, 2003  
Drugs, Driving, and Human Performance, American Academy of Forensic Sciences, 2001  
Marijuana: A Forensic Symposium, American Academy of Forensic Sciences, 1999  
Human Performance/Drugs and Driving Seminar, Society of Forensic Toxicologists, 1996  
Inspector Training Course, College of American Pathologists Forensic Urine Drug Testing (FUDT) Laboratory Accreditation Program, 1996  
Human Performance/Drugs and Driving, Society of Forensic Toxicologists, 1993  
Analytical Toxicology Workshop, Society of Forensic Toxicologists, 1993  
Laboratory Aspects of Forensic Urine Drug Testing, Center for Human Toxicology, University of Utah, 1992

**Title** Chief Technology Officer

**Professional  
Biography**

Mr. Lanterman is an eleven-year veteran police investigator. He was a member of the US Secret Service Electronic Crimes Taskforce, and has routinely assisted the Secret Service, FBI and the United States Attorney's Office as well as law enforcement entities across the country with computer related investigations.

Lanterman has successfully led hundreds of forensic investigations, interfacing and supporting large legal organizations, corporations, and governmental organizations.

Lanterman is a sought-after speaker in the United States and abroad, and as such has presented for the Minnesota Criminal Justice Institute, the Minnesota Employment Law Institute, the Minnesota State Bar Association, the California State Bar Association, the Wisconsin State Bar, the New York State Bar Association, the Tennessee State Bar Association, the Association of Certified Fraud Examiners, the International Association of Financial Crime Investigators, the American Society for Industrial Security, Hamline Law School, represented the US Secret Service at the International Association of Chiefs of Police National Conference and for many other organizations.

He frequently teaches CLE classes and is an adjunct professor of computer forensics.

Lanterman has been a court appointed computer forensic expert to the Honorable Patricia Kerr-Karasov, Hennepin County District Court (Minnesota), and to the Honorable A.P. Fuller of the Pennington County Circuit Court (South Dakota).

In 2003, the Director of the United States Secret Service recognized Lanterman for his contributions to law enforcement.

**Core Skills**

- Forensic hard drive imaging
- Forensic data analysis
- Proactive forensic analysis
- Electronic discovery consulting
- Deposition preparation
- Expert witness testimony

**Education**

Upsala College

- B.S. Computer Science
- M.S. Computer Science

US Department of Homeland Security

- Seized Computer Evidence Recovery Specialist Certification

Pennsylvania Municipal Police Officer's Training, John Reid Interrogation Training, and SEARCH Internet Investigation Training

Minnesota Bureau of Criminal Apprehension

- Management Series Certification

National White Collar Crime Center

- Advanced Data Recovery

# Harley R. Myler

## *University Address*

Phillip M. Drayer Department of  
Electrical Engineering  
Lamar University Box 10029  
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## *Home Address*

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## ***Professional Preparation***

New Mexico State University 1985 Ph.D., Electrical Engineering  
1981 M.S., Electrical Engineering

Virginia Military Institute 1975 B.S., Chemistry & Electrical Engineering  
(double-major)

## ***Academic Appointments***

2001- Professor & Chair, Lamar University Electrical Engineering  
William B. and Mary G. Mitchell Endowed Chair in Engineering  
1997-2001 Professor, University of Central Florida  
1991-1997 Associate Professor, University of Central Florida  
1986-1991 Assistant Professor, University of Central Florida  
1985-1986 Adjunct Professor, Florida Institute of Technology  
1984-1985 Instructor, New Mexico State University

## ***Industrial Experience***

President, I-Math Associates, Orlando, FL.  
Staff Engineer, Martin Marietta Orlando Aerospace, Orlando, FL.  
Digital Systems Engineer, Space Communications Company, Las Cruces, NM.  
Digital Systems Engineer, General Instrument Corporation, El Paso, TX.  
CPT, US Army Air Defense Artillery, Missile Systems Officer.

## ***Administrative Summary***

In August of 2001 I accepted the position of Chair of the Department of Electrical Engineering at Lamar University. During my tenure at Lamar, the department has hired three full-time faculty members and research and teaching productivity has increased substantially. The enrollment has grown to the point that Electrical Engineering has the largest student population in an accredited engineering program at Lamar. I have participated in three ABET accreditation cycles in my career, all of which resulted in the maximum six year accreditation. At Lamar, I prepared the Self-Study Report for the department and also established the publication of the department ABET data online. The undergraduate department scholarship endowment has tripled since I became chair. Also during my tenure, Phillip and Karen Drayer named the department with a five million dollar estate gift endowment.

### **Committee Work**

Multicultural Enhancement Committee, 2008-present  
Chair, Mechanical Engineering Department Chair Search Committee, 2006-2007  
Council of Instructional Departments, President, 2003-2004  
Academic Council, 2003-2004  
Campus Survey of Needs, 2003-2004  
Goldwater Scholarship Representative, 2002-present  
Budget Development Committee, 2003-2004  
Council on Scholarships and Fellowships Advisement, 2002-present  
Honors Council/Honors Faculty, 2001-present  
Doctor of Engineering Funding Allocation Committee, Chair, 2004-2004  
Minimal Core Coalition, Chair, 2004-present  
HEAF Policy Committee, Chair, 2002-2003  
Mathematics Curriculum Development Committee, 2003-2003  
College of Engineering Strategic Planning Committee, 2001-2002  
College of Engineering Long Range Planning, 2001-2002  
Patent Committee, 2001-present  
Academic Master Planning, 2001-2002

## **Administrative Training**

Accreditation Board of Engineering and Technology (ABET) EAC 2000 Workshop, Electrical & Computer Engineering Department Heads Association, New Orleans, LA, March 2005.

Thirty-eighth Annual Summer Seminar on Academic Administration: The New Administrator in Higher Education: Building Leadership Capacity, Texas A&M University, College Station, TX, July 2005.

Agents of Change workshop on Achieving Diversity in Electrical and Computer Engineering Research and Education, National Science Foundation, Washington, D.C., June 2003.

## ***Academic/Research/Creative Summary***

I have been active in research since the beginning of my graduate education at the New Mexico State University. I worked as an Instructor and Research Assistant in the Department of Electrical & Computer Engineering and was funded through the Electronic Vision Analysis Laboratory (EVAL) under a grant from the U.S. Army Atmospheric Sciences Lab at White Sands, New Mexico. My dissertation, Knowledge-Based Intelligent Tracking (1985), was researched at the lab and was an early exploration into knowledge-based control and fuzzy-logic systems. Since then, I have authored or co-authored over thirty refereed journal and special collection articles, four books that have been enthusiastically received by the engineering and scientific communities and have been granted two patents. My books are in distribution internationally with over ten thousand volumes in print. I supervised six doctorates while at the University of Central Florida and one Doctor of Engineering at Lamar University. I have been PI or Co-PI for over \$1.4M in federally funded grants and was named "Researcher of the Year" four times by my colleagues at the University of Central Florida. At Lamar University I have been given the distinguished honor of being named the inaugural holder of the William B. and Mary G. Mitchell Endowed Chair in Engineering.

## **Patents and Software Copyrights**

Method for Measuring and Analyzing Digital Video Quality, 2003, U.S. Patent #6577764.

Trophorometer, 1991, U.S. Patent #5,094,521.

Automated Knowledge Generation©1989, University of Central Florida.

UCFImage©1998, University of Central Florida.

simANNs©1989, ANNview© 1991, parsimANNs© 1991, University of Central Florida.

## Books

1. Myler, H. R., *Fundamentals of Engineering Programming with C and Fortran*, Cambridge University Press, 1998.
2. Myler, H. R., *Fundamentals of Machine Vision: Theory and Application*, SPIE Press, 1998.
3. Myler, H. R. and Weeks, A. R., *Computer Imaging Recipes in C*, Prentice-Hall, 1993.
4. Myler, H. R. and Weeks, A.R., *The Pocket Handbook of Image Processing Algorithms in C*, Prentice-Hall, 1993.

## Refereed and Special Collection Articles

1. Myler, H. R., "Video and Bandwidth: the promise of profitability," *International Engineering Consortium Annual Review of Communications*, Volume 60, December 2007.
2. Myler, H. R., "The Convergence of IPTV and HTPC" in Delivering the Promise of IPTV, *International Engineering Consortium Comprehensive Report*, 2006.
3. Myler, H. R., Bagasrawala, S. A., Narayana, N. V. "OFDM and GSM Protocol Optimization on a Software Defined Radio Parallel Processing Architecture," *International Engineering Consortium Annual Review of Communications*, Volume 58, September 2005.
4. Guo, J., Van Dyke-Lewis, M. and Myler, H. R., "Gabor Difference Analysis of Digital Video Quality," *IEEE Transactions on Broadcasting*, 50:3, September 2004, pp. 302-311.
5. Myler, H. R., Guo, J., and Van Dyke-Lewis, M. "No-Reference Digital Video Quality Analysis," *International Engineering Consortium Annual Review of Communications*, Volume 57, September 2004.
6. Liviu I. Voicu, Mosleh Uddin, Harley R. Myler, Anthony Gallagher, Julien Schuler, "Clutter modeling in infrared images using genetic programming," *Optical Engineering* 39(09) pp. 2359-2371, Sep 2000.
7. Weeks, A. R., Sartor, L. J. and Myler, H. R., "Histogram specification of 24-bit color images in the color difference (C-Y) color space," *Journal of Electronic Imaging*, Volume 8, Issue 3, July 1999, pp. 290-300.
8. Myler, H. R., "Teaching C & Fortran Simultaneously to Beginning Engineering Students," Southeastern Section ASEE Annual Conference, Clemson University, April 1999.
9. Voicu, L. I. and Myler, H. R., "Function support retrieval using a genetic algorithm cloning operator," *Electronic Imaging Technical Working Group Newsletter*, 8:1, January 1998, Invited.

10. Rabadi, W. A. and Myler, H. R., "A fast wavelet based algorithm for signal recovery from partial Fourier domain information," *IEEE Trans. on Circuits and Systems*, 45:8, August 1998.
11. Rabadi, W. A. and Myler, H. R., "Iterative Image Reconstruction: A Wavelet Approach," *IEEE Signal Processing Letters*, 5:1, January 1998.
12. Voicu, L. I., Rabadi, W. A. and Myler, H. R., "Object Support Reconstruction from the support of its autocorrelation using genetic algorithms," *Optical Engineering*, 36:10, October 1997.
13. Voicu, L. I., Myler, H. R. and Weeks, A. R. "Practical considerations on color image enhancement using homomorphic filtering," *Journal of Electronic Imaging*, Volume 6, Issue 1, January 1997, pp. 108-113.
14. Rabadi, W. A., Myler, H. R., Weeks, A. R., "Iterative multiresolution algorithm for image reconstruction from the magnitude of its Fourier transform," *Optical Engineering*, 35:4, March 1996, pp. 1015-1024.
15. Weeks, A. R., Hague, G. E. and Myler, H. R., "Histogram equalization of 24-bit color images in the color difference (C-Y) color space," *Journal of Electronic Imaging*, Volume 4, Issue 1, January 1995, pp. 15-22.
16. Weeks, A.R., Myler, H. R., and Emery, J.D., "Nonlinear Image Transformations Implemented with Spatial Light Modulators," *Optical Engineering*, 33:3, 1994.
17. Gonzalez, A. J., Myler, H. R. , McKenzie, F.D., Towhidnejad, M. and Kladke, R.R., "Representation of Process System Knowledge through Constraint Description," *IEEE Transactions on Knowledge and Data Engineering*, 6:4, 1994.
18. Myler, H. R., "A Project Oriented Approach to the Teaching of Machine Perception," *IEEE Transactions on Education*, 36:4, 1993.
19. Towhidnejad, M., Myler, H. R. and Gonzalez, A.J., "Constraint Mechanism in Automated Knowledge Acquisition," *Applied Artificial Intelligence*, 7, 1993.
20. Gonzalez, A. J., Myler, H. R. and McKenzie, F.D., "Representation of Process System Knowledge through Component Constraint Descriptions," *Engineering Applications of Artificial Intelligence*, 6:3, 1993.
21. Weeks, A.R., Myler, H. R., and Lewis, M. D., "An Adaptive Thresholding Algorithm that Maximizes Edge-Features," *Journal of Electronic Imaging*, November, 1993.
22. Weeks, A.R., Myler, H. R., and Weenas, H.G., "Computer-generated Noise Images for the Evaluation of Image Processing Algorithms," *Optical Engineering*, 32:5, 1993.
23. Myler, H. R., Weeks, A.R., Gillis, R. K. and Hall, G. W., "Object-oriented Neural Simulation Tools for a Hypercube Parallel Machine," *Neurocomputing*, 4, 1992.
24. Weeks, A.R., Myler, H. R., and Emery, J.D., "The Implementation of a Hybrid Optical Homomorphic Filter Using an LCTV as a Spatial Light Modulator," *Optical Engineering*, 31:9, 1992.

25. Myler, H. R., "A Neural Computer for Memory-Based Reasoning in Spacecraft Launch Operations," *Journal of Neural Network Computing*, 2:4, Spring 1991.
26. Gonzalez, A. J., Myler, H. R. and Kladke, R.R., "Identification of Unconstrained Item Descriptions Using String-Match Heuristics," *International Journal of Expert Systems: Research and Applications*, 4:3, 1991.
27. Gonzalez, A.J. and Myler, H. R., "Issues in Automating the Extraction of a System Model from CAD Databases for Use in Model-Based Reasoning," *International Journal of Expert Systems: Research and Applications*, 4:1, 1991.
28. Myler, H. R. and Gilson, R.D., "Taxonomic Selection of Computer-Driven Visual Display Systems," *Computer Standards and Interfaces*, 12, 1991.
29. Myler, H. R., Jolson, A.S. and Weeks, A.R., "Automated Evaluation of Ocular Deviation," *Binocular Vision*, 6:3, 1991.
30. Myler, H. R., Gonzalez, A.J. and Towhidnejad, M., "Constraint Mechanisms for Model-Based Knowledge Acquisition from Computer Aided Design Data," *AI EDAM*, 4:3, 1993.
31. Gonzalez, A. J., Myler, H. R., Towhidnejad, M., McKenzie, F. and Kladke, R., "Automated Knowledge Generation from a CAD Database," Knowledge Discovery in Databases, G. Pietetsky-Shapiro and W. J. Frawley, eds., AAAI Press, 1991.
32. Heileman, G.L., Myler, H. R. and Georgiopoulos, M., "Incorporating Concurrent Processes into the Object-Oriented Simulation of Neural Networks," Proceedings of the 3rd Annual Florida AI Research Symposium, April 1990. Selected for inclusion in the text *Advances in Artificial Intelligence Research*, Vol. 2, JAI Press, 1991.
33. Heileman, G.L., Myler, H. R., Georgepoulous, M., and Papadourakis, G., "Comparison of Learning Algorithms for Multi-layer Neural Networks," Proceedings of the Second Annual Florida AI Research Symposium, April 1989. Note: This paper was selected for inclusion in the book *Advances in Artificial Intelligence Research*, Vol. 2, JAI Press, 1991.
34. Myler, H. R., A.J. Gonzalez, Towhidnejad, M., McKenzie, F.D. and Kladke, R.R., "Automated Knowledge Generation from Incomplete CAD Data: Research Results," Proceedings of the 2nd Annual Florida Artificial Intelligence Symposium, April 1989. Note: This paper was selected for inclusion in the book *Advances in Artificial Intelligence Research*, Vol. 2, JAI Press, 1991.
35. Gonzalez, A.J., Myler, H. R., Owen, B.C. and Towhidnejad, M., "Automated Generation of Knowledge from CAD Design Data Bases," Proceedings of the 1st Florida Artificial Intelligence Research Symposium, May 1988. Note: This paper was selected for inclusion in the book *Advances in Artificial Intelligence Research*, Vol. 1, JAI Press, 1989.
36. Karshmer, A.I., Myler, H. R. and Davis, R., "The Architecture of an Inexpensive and Portable Talking-Tactile Terminal to Aid the Visually Handicapped," *Computer Standards and Interfaces*, Vol. 4, North-Holland, 1986.

## Conference and Proceedings Articles and Presentations

1. Myler, H. R., "Network and Media Convergence: Issues, Challenges and Trends," Keynote Speech, *IEEE International Conference on Information and Communications Technology*, Cairo, Egypt, December 2007.
2. Myler, H. R., "Bandwidth Issues in Advanced Video Quality and Delivery," *Proceedings of the IEEE International Conference on Information and Communications Technology, invited*, Cairo, Egypt, December 2007.
3. Myler, H. R., "Intellectual Property Issues," Southwest Electrical and Computer Engineering Department Heads Association (SWECEDHA) Annual Meeting, Sante Fe, New Mexico, November 2007.
4. Myler, H. R., Bagasrawala, S. A., Narayana, N. V., "A Concurrent Processing Approach for Software Defined Radio Baseband Design," *2005 IEEE Region V Technical Conference*, Denver, Colorado, April 2005.
5. Myler, H. R., "Early Electrical Engineering Concepts Engagement in a Freshman Level Introductory Course," *Gulf Southwest Section ASEE Annual Conference*, Texas Tech University, Lubbock Texas, March 2004.
6. Osmanovic, N., Hrustemovic, N. and Myler, H. R., "A Testbed for Auralization of Graphic Art," *IEEE Region V 2003 Annual Technical Conference*, New Orleans, Louisiana, April 2003.
7. Myler, H. R., "An Analysis of Programming Aptitude of Engineering Undergraduates," *Southeastern Section ASEE Annual Conference*, Virginia Polytechnic and State University, April 2000.
8. Myler, H. R., "Characterization of disagreement in multiplatform and multisensor fusion analysis," *Signal Processing, Sensor Fusion, and Target Recognition IX*, SPIE Aerosense 2000, Orlando, Florida, April 2000.
9. Voicu, L. I., Patton, R. and Myler, H. "Detection performance prediction on IR images assisted by evolutionary learning," *Proceedings of the SPIE International Symposium on Aerospace Sensing*, Orlando, April 1999.
10. Patton, R., Voicu, L. I., Smith, S. P. and Myler, H. R., "Computationally intelligent approach to SAR-ATR," *Proc. SPIE Vol. 3721, p. 543-553, Algorithms for Synthetic Aperture Radar Imagery VI*, Orlando, April 1999.
11. Voicu, L. I., Patton, R. and Myler, H. R., "Multi-criterion vehicle pose estimation for SAR-ATR," *Proc. SPIE Vol. 3721, p. 497-506, Algorithms for Synthetic Aperture Radar Imagery VI*, Orlando, April 1999.
12. Weeks, A.R., Sartor, L. J. and Myler, H. R., "Histogram Specification of 24-bit Color Images in the Color Difference (C-Y) Space," *Proceedings of the Symposium on Electronic Imaging Science and Technology*, San Jose, February 1999.

13. Voicu, L. I. and Myler, H. R., "Cloning Operator and its Applications," *Proceedings of the SPIE Conference on Applications and Science of Computational Intelligence*, Orlando, Florida, April 1998.
14. M. Uddin and Myler, H. R., "Parallel Algorithm for Target Recognition using a Multiclass Hash Database," *Proceedings of the SPIE Conference on Signal Processing, Sensor Fusion and Target Recognition VII*, Orlando, Florida, April 1998.
15. Myler, H. R., "Semiotic Foundation for Multisensor/Multilook Fusion," *Proceedings of the SPIE Conference on SPIE Conference on Signal Processing, Sensor Fusion and Target Recognition VII*, Orlando, Florida, April 1998.
16. Myler, H. R., Patton, R., "Approach to multisensor/multilook information fusion," Proc. SPIE Vol. 3068, p. 2-7, *Signal Processing, Sensor Fusion, and Target Recognition VI*, July 1997.
17. Myler, H. R., "Application of the Neocognitron to target identification," Proc. SPIE Vol. 3077, p. 282-290, *Applications and Science of Artificial Neural Networks III*, April 1997.
18. Rabadi, W. A., Myler, H. R., "Image reconstruction using wavelets," Proc. SPIE Vol. 2751, p. 153-158, *Hybrid Image and Signal Processing V*, June 1996.
19. Rabadi, W. A., Myler, H. R., Weeks, A. R., Gamble, K. J., "Pyramid framework for image reconstruction from nonimaged laser speckle," Proc. SPIE Vol. 2484, p. 309320, *Signal Processing, Sensor Fusion, and Target Recognition IV*, July 1995.
20. Gamble, K. J., Weeks, A. R., Myler, H. R., Rabadi, W. A., "Results of two-dimensional time-evolved phase screen computer simulations," Proc. SPIE Vol. 2471, p. 170-180, *Atmospheric Propagation and Remote Sensing IV*, July 1995.
21. Weeks, A. R., Felix, C. E., Myler, H. R., "Edge detection of color images using the HSL color space," Proc. SPIE Vol. 2424, p. 291-301, *Nonlinear Image Processing VI*, March 1995.
22. Myler, H. R., Weeks, A. R., Voicu, L., "RGB color enhancement using homomorphic filtering," Proc. SPIE Vol. 2421, p. 43-50, *Image and Video Processing III*, March 1995.
23. Yoo, H. J., Crevier, D., Lepage, R., Myler, H. R., "Line drawing extraction from gray level images by feature integration," Proc. SPIE Vol. 2353, p. 96-107, *Intelligent Robots and Computer Vision XIII: Algorithms and Computer Vision*, October 1994.
24. Clifton, D.B., Myler, H. R., Weeks, A.R., "An Approach to the Acquisition of a World Frame using a Visual Associative Memory," *Proceedings of IEEE International conference on Neural networks, IEEE World Congress on Computational Intelligence*, Vol. 2, June 1994, Orlando.
25. Rabadi, W., Myler, H. R. and Weeks, A.R., "Large-Scale Image Transforms on a Hypercube Supercomputer," *Proceedings of the Second Congress of the Network of Arab Scientists and Technologists Abroad*, Amman, Jordan, July 1994.

26. Myler, H. R., Weeks, A.R. and Yoo, H. J., "Grayscale Image Preprocessing for Viewpoint Independent 3-D Extraction of Objects," *Proceedings of the SPIE International Symposium on Optics, Imaging and Instrumentation*, San Diego, 1994.
27. Myler, H. R., Weeks, A.R. and Rabadi, W., "Speckle Simulation Movies for Analysis and Evaluation of Laser Systems," *Proceedings of the SPIE International Symposium on Aerospace Sensing*, Orlando, 1994.
28. Weeks, A.R., Myler, H. R., and Apley, L. F., "An adaptive thresholding algorithm which maximizes the contour features within the thresholded image," *Proceedings of the Symposium on Electronic Imaging Science and Technology*, San Jose, February 1994.
29. Hague, G. E., Weeks, A. R., Myler, H. R., "Histogram equalization of the saturation component for true-color images using the C-Y color space," *Proc. SPIE Vol. 2298*,
30. p. 236-247, *Applications of Digital Image Processing XVII*, September 1994.
31. Weeks, A. R., Myler, H. R., Cinci, L. D., "Interpretive programming language for image algebra," *Proc. SPIE Vol. 2300*, p. 180-191, *Image Algebra and Morphological Image Processing V*, June 1994.
32. Lewis, M. D., Weeks, A. R., Myler, H. R., "Maximization of contour edge detection using adaptive thresholding," *Proc. SPIE Vol. 1955*, p. 400-407, *Signal Processing, Sensor Fusion, and Target Recognition II*, September 1993.
33. Yoo, H. J., Myler, H. R., Weeks, A. R., "Surface extraction using spatial position from line drawings," *Proc. SPIE Vol. 1955*, p. 388-399, *Signal Processing, Sensor Fusion, and Target Recognition II*, September 1993.
34. Weeks, A. R., Myler, H. R., Jolson, A. S., "Calibration issues in the measurement of ocular movement and position using computer image processing," *Proc. SPIE Vol. 1567*, p. 77-87, *Applications of Digital Image Processing XIV*, December 1991.
35. Myler, H. R., Weeks, A. R., Van Dyke-Lewis, M., "Decision-directed entropy-based adaptive filtering," *Proc. SPIE Vol. 1565*, p. 57-68, *Adaptive Signal Processing*, December 1991.
36. Wenaas, H., Weeks, A. R., Myler, H. R., "Computer-generated correlated noise images for various statistical distributions," *Proc. SPIE Vol. 1569*, p. 410-421,
37. *Stochastic and Neural Methods in Signal Processing, Image Processing, and Computer Vision*, October 1991.
38. Myler, H. R., Weeks, A.R. and Hooper-Giles, J., "A Novel Approach to Aircraft Silhouette Recognition Using Genetic Algorithms," *Proceedings of the SPIE International Symposium on Optical Engineering and Photonics*, 1992.
39. Weeks, A.R., Myler, H. R., and Hinnerschitz, S., "Aspects of Real-Time Video Tracker Design," *Proceedings of the SPIE International Symposium on Optical Engineering and Photonics*, 1992.

40. Myler, H. R., "Experiments in Computer Vision Instructional Development," *Proceedings of the 21st Annual Pittsburgh Conference on Modeling and Simulation*, May 1990.
41. Gilson, R.D., Myler, H. R. and Gibbons, S.C., "Taxonomic Transformations of Visual Media Selections into Display Specifications," *Proceedings of the Image V Conference*, June 1990.
42. Weeks, A.R., Bauer, C.S., Myler, H. R. and Khajenoori, S., "An Innovative Undergraduate Computer Systems Laboratory," *Proceedings of the 1990 ASEE Conference*, June 1990.
43. Gillis, R.K., Heileman, G.L., Myler, H. R., and Georgiopoulos, M., "Software Tools for the Development of Artificial Neural Network Models," *Proceedings of the 1990 ASEE Conference*, June 1990.
44. Weeks, A.R., Khajenoori, S., Bauer, C.S., and Myler, H. R., "Embedded Microprocessors: A Capstone Course in Undergraduate Computer Engineering Education," *Proceedings of the 21st Annual Pittsburgh Conference on Modeling and Simulation*, May 1990.
45. Myler, H. R., "Machine Vision Analysis of Human Eye Movements," *Proceedings of the 20th Annual Pittsburgh Conference on Modeling and Simulation*, May 1989.
46. Myler, H. R., "Design Optimization of a Six-Legged Walking Platform," *Proceedings of the 20th Annual Pittsburgh Conference on Modeling and Simulation*, May 1989. Gonzalez, A.J., and Myler, H. R., "An Intelligent Instructor Support System for Training Simulators," *Proceedings of the 1989 AI and Simulation Conference*, April 1989.
47. Gonzalez, A. J., Myler, H. R., and Towhidnejad, M., "Automated Knowledge Generation in Support of Shuttle Ground Operations," *Proceedings of the Artificial Intelligence in Government Conference*, March 1989.
48. Myler, H. R. and Gonzalez, A. J., "Automated Knowledge Base Generation from CAD Databases Using Relaxation Techniques," *Proceedings of the International Symposium on Intelligent Control*, August 1988.
49. Myler, H. R., "Visual Primitive Recognition," *Proceedings of the 19th Annual Pittsburgh Conference on Modeling and Simulation*, May 1988.
50. Myler, H. R., "Object-Oriented Training Simulation," *Proceedings of the SCS Eastern Simulation Conference*, April 1988.
51. Myler, H. R., "Application of Hopfield Networks to Visual Tracking," *Proceedings of the 18th Annual Pittsburgh Conference on Modeling and Simulation*, 18, 1987.
52. Myler, H. R., Thompson, W. E. and Flachs, G. M., "Knowledge-Based Enhancement of Visual Tracking," *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2, 1985.

53. Myler, H. R., Thompson, W. E. and Flachs, G. M., "Application of Expert System Techniques to a Visual Tracker," *Proceedings of the SPIE Conference on Artificial Intelligence II*, 1985.
54. Myler, H. R. and Thompson, W. E., "Knowledge-Based Intelligent Tracking," *IEEE International Conference on Systems, Man, and Cybernetics*, 1985.
55. Myler, H. R. and Thompson, W. E., "Computer Simulation of Intelligent Tracking," *Proceedings of the 17th Annual Pittsburgh Conference on Modeling and Simulation*, 1986.
56. Karshmer, A. I., Myler, H. R. and Davis, R., "An Inexpensive and Portable Talking Tactile Terminal for the Visually Handicapped," *Proceedings of the 19th Annual Hawaii International Conference on Systems Science*, 3, 1986.

### **Awards and Honors**

Tau Beta Pi (engineering), Eta Kappa Nu (electrical engineering)

Outstanding Participation, IEEE, National Engineers Week, 1993.

Educator of the Year, UCF Department of Electrical & Computer Engineering, 1993.

Researcher of the Year, UCF Department of Computer Engineering, 1988, 1989, 1990, 1992.

Academy Member, Klipsch School of Electrical & Computer Engineering, New Mexico State University.

CRC Freshman Chemistry Award, 1973.

Eagle Scout, 1970, Troop 108, Leetsdale, Pennsylvania, BSA.

### **Doctoral Field Studies Supervised (Lamar University)**

Jing Jane Guo, DE, 2003

*Gabor Difference Analysis of Digital Video Quality*

Wei-Tai Hsu, DE, 2009 (August)

*A Dynamic Facial Recognition System for Tracking Individuals in an Enclosed Domain*

### **Dissertations Supervised (University of Central Florida)**

Liviu Voicu, PhD, 1997

*Issues in Multiresolution Genetic Algorithms*

Wissam Rabadi, PhD, 1995

*Multiresolution Image Processing*

Hoi Yoo, PhD, 1993  
*VITREO: Viewpoint Independent Three-dimensional Recognition and Extraction of Objects*

Massood Towhidnejad, PhD, 1990  
*Functional Conflict Resolution in Automated Knowledge Generation*

John DeCatrel, PhD, 1990  
*Recognition by Aspect Constrained Stochastic Optimization*

Gregory Heileman, PhD, 1989  
*Theoretical and Experimental Aspects of Supervised Learning in Artificial Neural Networks.*

#### **Theses (MSEE) Supervised—Lamar University**

Chiraq Soni, 2007, *Analysis of Cell Phone Repeaters and Prototype Design of an Economical CDMA Cell Phone Coverage Signal Expander for Indoor Applications*

Hikmet Cenghiz, 2006, *A Biomimetic Approach to Motion Estimation in a SIMD Architecture*

Pramod Varma, 2005, *High Speed Data Transfer Over IEEE 1394 for Software Defined Radio*

Venkata Prabala, 2005, *Analysis of the Infinite Image Window*

Akshat Nanda, 2005, *A Performance Analysis of Micro-Architectures for Mobile Device Communications*

Deepika Shevade, 2005, *Multiple Object Tracking in an Image Sequence*

Shabbir A. Bagasrawala, 2004, *OFDM in a Parallel Architecture Implementation of a Software Defined Radio*

Naresh V. Narayana, 2004, *GSM Baseband Optimization On A Software Defined Radio Parallel Processing Architecture*

Mithun Bannerjee, 2004, *Implementation of ITU-T G.729 Speech Codec*

Samir V. Bansikar, 2003, *Optimization of JPEG Image Compression Using Video Quality Metric*

Ravi Bellapu, 2003, *Steganographic Techniques for No-Reference Digital Video Quality Analysis*

Supriya Kher, 2003, *Object Tracking in Compressed MPEG Video Bitsream*

Prashant. K. Ruparel, 2003, *Auralization Synthesis (Sonification) for Control Room Alerts*

**Theses (MSEE) Supervised—University of Central Florida**

Mosleh Uddin, 1998, *A Parallel Algorithm for Target Classification Using Geometric Hashing*

Arthur Chang, 1994, *Implementation of the Two-Dimensional Fast Hartley Transform on a Fine-grained SIMD Architecture*

Benito Graniela, 1992, *Visual Primitive Decomposition Using the Pattern Spectrum*

Jill Giles, 1991, *A Medial Axis Transformation Language for Recognizing Aircraft Silhouettes Using a Genetic Search Technique*

Kathleen Meade, 1991, *A Novel Algorithm for Detecting Erroneous Control Points in Geometric Correction of Imagery*

Gary Hall, 1991, *ANNview: A CASE Tool for Development and Evaluation of Artificial Neural Networks*

Randall Gillis, 1991, *A General Object-Oriented Environment for the Development of Artificial Neural Network Models on a Hypercube Multiprocessor Network*

Shuk Fong Lai, 1990, *Algorithms for Fine-Grained Architecture Implementation of 2-Dimensional Fast Walsh-Hadamard Transforms*

Cynthia Johnson, 1990, *Counterpropagation Neural Network Detection of Visual Primitives*

Mitchell Winter, 1989, *VLSI Implementation of a Configurable Neural Node*

Paul Vogt, 1988, *An Adaptive Multi-Scene Correlation Algorithm*

Ronald Bauman, 1988, *GAPP Instruction Simulator*

Eric Grajales, 1987, *Edge Confidence Estimation for Subsequent Image Analysis*

Julie LeBlanc, 1987, *Implementation of a Parallel Ynet Architecture*

Nancy Burrell, 1986, *Adaptive Discrete Cosine Transform Image Compression Applied to Visual Flight Simulators*

Robert Holden, 1986, *Design Considerations in the Development of an Automated Cartographic System*

## Research Grants

Entergy Corporation, Power Grid defense for Solar Magnetic Storms, \$30K.

Phillips Electronics, LineDancer Software Radio development system, \$25K.

Launching the Texas Engineering Education Pipeline: Deploying the Infinity Project Statewide, THECB, Austin, Texas, \$71K.

Edison Museum Website, Entergy Corporation, Beaumont, Texas, \$5K.

Adaptive Synthesis of an Objective Image Quality Function, TeraNex, Inc., Orlando, Florida, \$190,469.

Memory-Based Reasoning for Advanced Launch Operations, NASA Grant #NCC-10-0003, Kennedy Space Center, Titusville, Florida. \$147,448.

Automated Knowledge Generation (Co-Pi with A. Gonzalez) NASA Grant #NAG-10-0043, Kennedy Space Center, Titusville, Florida, \$456,095.

Visual Simulation Characteristics as Related to Human Factors and Training Needs (Co-Pi with R. Gilson) Army Research Institute, NTSC, Orlando, Florida. \$75K.

Visual Display Taxonomy (Summer, Co-Pi with R. Gilson). ARI Grant #M67-004/87/M/2227, Naval Training Systems Center, Orlando, Florida, \$22,924.

Investigation of Connectionist Vision Models for Knowledge-Based Intelligent Tracking Systems. Center for Research in Electro-Optics and Lasers, grant #2052033, University of Central Florida, \$44,670.

CREOL Support to the Innovative Science & Technology Program II: Array Imaging(2 years, Co-Pi with P. Gatt, M. Stickley, A. Weeks) Office of Naval Research, Boston, Massachusetts, \$140,173.

CREOL Support to the Innovative Science & Technology Program III: Array Imaging(Co-Pi with P. Gatt, M. Stickley, A. Weeks) Office of Naval Research, Boston, Massachusetts, \$94,462+30K for nCUBE.

CREOL Support to the Innovative Science & Technology Program IV: Array Imaging(Co-Pi with P. Gatt, M. Stickley, A. Weeks) Office of Naval Research, Boston, Massachusetts, \$412K.

Software Tools for Neural Network Modelling, (Co-PI with M. Georgiopolous, & G. Heileman), Florida High Technology Council, \$20K.

Parallel Network Modelling Tools, Martin Marietta Orlando Aerospace, \$10K.  
Florida Space Grant Consortium--Undergraduate Research Participation Program  
NASA sponsored program for undergraduate research, \$20K.

Design Considerations in Construction of Planetary Walking Vehicles Martin  
Marietta Astronautics Company, Denver, Colorado, \$3K.

nCUBE Parallel Supercomputer (Equipment Grant w/ A. Weeks) nCUBE,  
Cupertino, California, \$160K.

Sparcserver 4/280 (Equipment Grant w/ A. Weeks) Sun Microsystems  
Incorporated, Mountainview, California, \$141K.

Expert Systems Software/Hardware. (Equipment Grant w/ A. Gonzalez) NASA  
Grant #NAG-10-0043, Kennedy Space Center, Titusville, Florida, \$31,025.

Towerview Workstations (Equipment Grant ) NCR Corporation, Engineering &  
Manufacturing, Lake Mary, Florida, \$6,345.

Motorola Computer Systems (Equipment Grant w/ A. Weeks) Emerge Systems,  
Inc., Melbourne, Florida, \$30K.

Intellidex Robots (Equipment Grant) Martin Marietta Orlando Aerospace,  
Orlando, Florida, \$5K.

### **Consulting Experience**

I-Math Associates, Orlando, FL.

Center for Occupational Research and Development (CORD), Waco, TX.

American Academy of Ophthalmology, San Francisco, California.

McDonnell-Douglas Aerospace Co., St. Louis, MO.

Martin-Marietta (now Lockheed), Orlando, Florida and Denver, CO.

Autonomous Technologies, Inc., Orlando, FL.

National Instruments, Austin, TX.

Analog Devices, Norwood, MA.

## ***Leadership/Service Summary***

At the University of Central Florida I served on the Faculty Senate for two terms and on the SACs Computer Committee. I was a founding member of the IEEE Orlando Section Systems, Robotics and Controls Society, a Chairman of that society for two years, and the founding advisor of the Student Chapter of the society. After moving to Beaumont Texas, I was elected Chair of the Beaumont Section of the IEEE and served two terms. In 2006 I served as the IEEE Region 5 East Area Chair. I hosted the yearly meeting of the Southwest Electrical and Computer Engineering Department Heads Association (SWECEDHA) meeting at Lamar University in November of 2004. SWECEDHA is a subunit of ECEDHA, the nationally scoped Electrical and Computer Engineering Department Heads Association, which also includes members from Canada, Mexico and Chile. The meeting held at Lamar drew participation from SWECEDHA member schools in Arizona, New Mexico and Texas. I have emphasized professional development in my activities with student organizations and have assisted the public schools in many ways to include assistance with computer network access, conduct of workshops for the engineering awareness education of High School teachers and students, and in the support of student science fair projects.

### **Active Professional Organizations and Licenses**

IEEE -Senior Member (1991-present)  
East Area Chair, IEEE Region V (2006-2007)  
Chair, Beaumont Section (2002-2006)  
Florida Professional Engineer (by examination)  
Electrical Engineering Lic. 94001152  
Texas Professional Engineer  
Electrical Engineering Lic. 94458

### **Student Organizations, Activities and Special Advisement**

Advisor (2002-present) Eta Kappa Nu, Delta Beta Chapter (Lamar University)  
HNRS 3161 Digital Video (Summer II 2007)  
Head Judge, Harmony Science Academy Science Fair (2007)  
McNair Scholar, Luis Dominguez, Engineering Design (2007)  
ELEN4102 EE Seminar (honors), "Ethics in Engineering", Jace Daigle, (2007)  
HNRS 3161 Machine Intelligence (Summer I 2005)  
Founding Advisor (1988-1999), UCF IEEE Robotics Society Student Chapter  
Advisor (1993-1995) Eta Kappa Nu, Zeta Chi Chapter (UCF)



**Karl D. Schubert, Ph.D.**

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Phone: 952.924.9920

**Title** VP of Technology Analysis

**Summary** Dr. Schubert has a successful track record in new technologies, development and delivery of leading edge software and embedded systems product families for Electronic Evidence Discovery and Litigation Support and other environments. Dr. Schubert has been deposed in several technology-based and management-based state and federal matters.

**Background** As VP & General Manager of Daticon, reorganized, restructured, re-tooled technologies and processes while retaining and expanding clients. Also, led the acquisition of DolphinSearch Electronic Data Discovery for integration into Daticon technology and offerings.

As the CTO & Corporate VP for Dell, successfully created and implemented the plan to enter into the storage systems business.

As a Senior Development Manager at IBM, led the architecture and development of the premiere client/server business document management product including scanning, coding and searching on multiple hardware and software platforms. As a Senior Technologist, developed and managed development of operating systems assembly language software and document management software, specializing in feedforward and feedback scheduling functions.

Consultant to Tier 1 Venture Capitalists such as Kleiner Perkins and NEA for technology start-ups.

Master's research in dynamic software simulation of biochemical processes.

Doctoral research in fluid dynamics of liquefied natural gas including development of the hardware, software, experiment control and data acquisition software from hot-wire anemometer probes.

Patents pending include hardware and software algorithms with patents pending on "Systems and methods for capture of electronic evidence" (filed May 2007) and "Systems and methods for electronic evidence management with service control point and agents" (filed May 2007).

Patents awarded include "System and method for time window access frequency based caching for memory controllers," US Patent No. 6507893, awarded January 2003; "System and method for time weighted access frequency based caching for memory controllers," US Patent No. 6487638, awarded November 2002; "Stylus Tilt Detection Apparatus for Communication with a Remote Digitizing Display," US Patent No. 5,414,227, awarded May 1995; "Voice Communication Features in an Untethered Personal Stylus for Digitizing Display," Docket No. BT9-92-030, April 1993.

**Education** Ph.D., Engineering, University of Arkansas

MS, Chemical Engineering, University of Kentucky

BS, Chemical Engineering, University of Arkansas

## Karl D. Schubert, PhD

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Phone: 952.924.9920

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- Awards**
- Distinguished Alumni Award, College of Engineering, University of Arkansas, April 2008
  - Elected to Arkansas Academy of Chemical Engineers, University of Arkansas, April 2008
  - Appointed to University of Arkansas College of Engineering Dean's Advisory Council, May 2009
- Speaker Bibliography**
- Invited Keynote Speaker, "Changing an Industry: Using Innovation to Empower Business," June 16, 2009, Minneapolis CIO Executive Summit.
  - Invited Keynote Speaker, "Sherman, Set the Wayback: Today's Adventure is Virtualization ...and the Year is 2008" at the 8th Annual Minnesota IT Symposium, Minneapolis, MN, October 30, 2008.
  - 2007 (May) invited speaker, "Enterprise T&E -- Adding Efficiency and Effectiveness to Meet the Requirements of the 21st Century," The American Society of Naval Engineers (ASNE) Wallops Island Chapter of the Tidewater Section, in conjunction with the Surface Combat Systems Center (SCSC) Wallops Island, VA (US Navy).
  - 2007 (April) Keynote speaker, "Looking to the Future," Department of Chemical Engineering Spring Banquet, University of Arkansas.
  - 2006 (October) Gartner EXP HR Fall Summit, "The Roles & Responsibilities of the CIO."
  - 2006 (June) Institute of Management Accountants 86th Annual Conference & Exposition,
  - "Battling for Leadership: What it Means to be "Chief" for CFOs and CIOs."
  - 2006 (April) Annual Magnitude Users' Group Conference, "Xitech Technology Strategy."
  - 2006 (March) Keynote Speaker & Panel Member: Indian School of Business/NASSCOM conference, Hyderabad, India, "An Ecosystem of innovation for a vibrant domestic IT industry."
  - 2006 (March) Harvard Business School Publishing (Webcast), "CIO Survival: Creating an IT Value Center."
  - 2006 (March) University of St. Thomas, "Working Internationally and Global Differences in the Work Place."
  - 2005 (April) BlueStream Ventures CIO Forum, "Finding the optimal time to implement new technologies: When does Leading Edge become Bleeding Edge?".
-

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2005 (April) Annual Magnitude Users' Group Conference, "Xitech Technology Strategy and Directions."

2004 (October) Storage Networking World Discussion Panel: "The Simplicity Imperative".

2004 (September) State of Florida Government Conference Keynote Speaker: "A Proactive Approach to Surviving and Thriving as a CIO."

2002 Fall Comdex Storage Systems Expert Panel, Las Vegas, NV, Nov. 2002.

2002 Large Scale Cluster Computing Workshop, Fermi Nat'l Lab, Oct. 2002.

2002 Server I/O Conference Panel on Storage Subsystems Futures, Monterey, Spring 2002.

2001 Fall Intel Developers Forum Conference InfiniBand Executive Panel, August 2001.

2001 Networked Storage Conference, Monterey, CA, June 2001.

2001 Storage Networking World (ComputerWorld & SNIA) Conference, April 2001.

2001 CeBIT Storage Systems Expert Panel, Hannover, Germany, March 2001.

2001 IMA CFO / Controller Conference, Orlando, FL, February 2001.

2001 I/O Technologies Forum Storage Virtualization Panel, Monterey, CA, February 2001.

2000 Fall Comdex Storage Systems Expert Panel, Las Vegas, NV, Nov. 2000

1999 Storage Networking Industry Association (SNIA) European Membership Development Conference, December 1999

1999 Fall Comdex Storage Systems Expert Panel, Las Vegas, NV, Nov. 1999

1999 Veritas World Conference, Anaheim, CA, November 1999

1999 Dell DirectConnect, Austin, TX, August 1999

1999 University of Minnesota Management Information Systems Research Council, Guest Lecturer, Minneapolis, MN, April 1999

1999 CeBIT Storage Systems Expert Panel, Hannover, Germany, March 1999

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1998 Fall Comdex Storage Systems Expert Panel, Las Vegas, NV, Nov. 1998

1998 Veritas World Conference, Phoenix, AZ, October 1998

1998 CIO Perspectives Conference, Orlando, FL, April 1998

### Patents / Disclosures

"Systems and methods for capture of electronic evidence," filed May 2007.

"Systems and methods for electronic evidence management with service control points and agents", filed May 2007.

"System and Method for Disk and Tape Sharing in a Multi-Computer Environment," patent application filed in year 2000.

"Method for Storage Device Masking in a Storage Area Network and Storage Controller and Storage Subsystem for Using Such a Method", US Patent No. 6742034 awarded May 2004.

"System and method for time window access frequency based caching for memory controllers," US Patent No. 6507893, awarded January 2003.

"System and method for time weighted access frequency based caching for memory controllers," US Patent No. 6487638, awarded November 2002.

"System and method for performing backup operations using a fibre channel fabric in a multi-computer environment," US Patent No. 6460113, awarded October 2002.

"Video Optimized Stream Server Subsystem," US Patent No. 5668948, awarded September 1997.

"Stylus Tilt Detection Apparatus for Communication with a Remote Digitizing Display," US Patent No. 5,414,227, awarded May 1995.

"Voice Communication Features in an Untethered Personal Stylus for Digitizing Display," Docket No. BT9-92-030, April 1993.

"Proximity Detector in the IBM Untethered Personal Stylus (UTS)," Docket No. BT0-91-0270, December 1991.

"Inking Width in the IBM Untethered Personal Stylus," Docket No. BT9-91-0264, December 1991.

"Signature Authentication in the IBM Untethered Personal Stylus (UTS)," Docket No. BG9-91-0263, December 1991.

### Boards

Member, Board of Directors, Minnesota Make A Wish Foundation, October 2008 - present.

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Appointed to University of Arkansas College of Engineering Dean's Advisory Council, May 2009.

### Publications

Author, *The CIO Survival Guide: The Roles and Responsibilities of the Chief Information Officer*, published by John Wiley & Sons, April 2004, 294pp.

Co-author, *CIO Best Practices: Enabling Strategic Value with Information Technology*, published by John Wiley & Sons, February 2007, 356pp.

Recurring series of articles in *Journal of Cost Management: IT Mind: Quality Assurance Engineering*, scheduled for inaugural issue, First Quarter, 2003.

Insights from the COO, a semi-regular set of articles to employees on various topics, approaches, and philosophies of interest, from 2001 – 2002.

Some Thoughts on Management, a semi-regular set of articles to the management team on various topics, approaches, and philosophies of interest, from 2001 – 2002.

"A Conversation with Dr. Karl D. Schubert", Joe and Catherine Stenzel, *Journal of Strategic Performance Measurement*, December 1999.

Choosing the Right RAID for Video, interviewed for and quoted in "Professional Video Graphics Magazine," published September 1996.

Advanced Development Methodologies: Small Team, Iterative, Incremental Function, Executable Drivers, March 1993 (internal IBM paper).

Concurrency control in advanced database applications by Naser S. Barghouti, et al., in *ACM Computer Surveys* 23 3 (September 1992) pp. 269-317, refereed review submitted November 1992 to *Computing Reviews (ACM)*.

Principles and realization strategies of multilevel transaction management by Gerhard Weikum in *ACM Trans. Database Syst.* 16 1 (March 1991) pp. 132-180, referred review published in *ACM Computer Reviews*, 33 1 (September 1992), p. 530.

ImagePlus Development Methodologies, IBM Image Specialists Update, September 1992.

ImagePlus Technical Strategy, June 1992, 95 pp. (internal IBM paper)  
System software in the 1990s, *Creativity!*, Volume 11, No. 2, June 1992, pp. 12-13 (IBM).

System software in the 1990s, November 1991, 75 pp. (internal IBM paper).

OnLine Transaction Processing – Client/Server, Corporate Technical Strategy Development Briefing Paper, September 1991, 115 pp. (internal

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IBM paper).

OnLine Transaction Process – Host-based, Corporate Technical Strategy Development Briefing Paper, May 1990, 135 pp. (internal IBM paper).

Systems Software Convergence & Interoperability, Corporate Technical Strategy Development Briefing Paper, January 1991, 95 pp. (internal IBM paper).

Numerous articles in IBM's internal VM Performance/Capacity Newsletter.

Regular articles in IBM Almaden Research's Internal Computing Bulletin.

Resource Management in the VM Environment – A Short Discussion, IBM Research Report RJ-4049, October 1983.

A Comparison of VM Backup/Recovery Products, August 1983 (internal IBM paper).

Development and Demonstration of an Experimental Facility for the Measurement of Heavy Gas Gravity Spreading and Dilution in a Calm Atmosphere, PhD Dissertation, University of Arkansas, US Coast Guard Hazardous Chemicals Research Laboratory, Fayetteville, Arkansas, January 1983.

Dynamic Simulation of Wastewater Treatment Systems with Applications to the Activated Sludge Process, MS Thesis, University of Kentucky, Lexington, KY, October 1976.

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