

WALLACE E. KELLY III
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SUMMARY

Experienced interdisciplinary researcher and entrepreneur in the field of aviation and defense. Inventor on multiple patents in the aviation domain. Expertise in intelligent systems, software development, and innovating for next-generation systems. Capable of marketing, winning, and executing on both government and industry-sponsored research. Experienced in managing and providing primary technical leadership on over \$1M of research annually.

EDUCATION

1997	Ph.D.	Electrical Engineering	Texas A&M University
1994	M.S.	Electrical Engineering	Texas A&M University – Kingsville
1993	B.S.	Electrical Engineering	Texas A&I University

EXPERIENCE

Blue Rock Research and Development President and Chief Scientist

March 2004 – present

Founded an R&D consulting company focusing on the challenge of innovating within the constraints of real-world systems.

DevelopMentor Instructor

November 2004 -- present

Teaching corporate short courses in software development topics, including managed code, asynchronous execution, and distributed applications.

Rockwell Scientific Company Information Sciences Senior Scientist Research Scientist

**January 2004 – March 2004
October 2000 – December 2003**

Co-founder of a satellite research lab in Research Triangle Park, NC. Helped grow the lab from two to nine researchers and software developers in three years. Assisted in developing the lab's unique capabilities to support R&D "From Research to Deployment." Served as RSC's representative to Rockwell Collins' Flight Deck Technology Panel.

Aviation Weather

- Program manager for RSC's Aviation Weather Information program, funded by NASA Aviation Safety program and Rockwell Collins IR&D.

- Led a team of six researchers and software developers in all aspects, including idea generation, proposal writing, project planning, system design, software development, deployment, and product support.
- Lead inventor on five related patents.

Flight Deck Information Fusion

- Program manager and technical lead on a key, competition-sensitive IR&D program.
- Led a team of three part-time researchers and software developers.

Mission Planning Support Tools

- Developed a prototype planning package for mission planners under DARPA-funded Active Templates program.
- The software (SOFPlans) has since been productized, deployed, and in operational use by Special Operations mission planners at JSOC and SOCPAC.

Resource Allocation Manager

- Participated as researcher and software developer for a prototype Resource Allocation Manager for scheduling RF functions on a phased array antenna. (Boeing/Navy funded.)
- Developed a search algorithm based on allocation templates; Boeing is pursuing a patent application.
- Technology is being integrated into the Navy's next-generation destroyer, DD(X).

Rockwell Collins

Manager, Autonomous Systems

Senior Design Engineer

January 2000 – October 2000

August 1997 – December 1999

Worked as manager and researcher in Rockwell Collins' Advanced Technology Center. Secured external and IR&D funding for advanced flight deck systems research. Interfaced to Rockwell's R&D division and sponsored university research projects.

Enhanced Airborne Weather Radar (EWxR)

- Developed concepts for automated WxR using artificial intelligence and data fusion techniques.
- Secured \$1.3M in NASA matching funding for four years of research.
- Provided program management, including project planning, budgeting, technical leadership, and customer interface.
- Led the development of the EWxR prototype, which has been test flown on the NASA ARIES experimental 757 and in the Rockwell Collins experimental Saberliner.
- Directed junior software developers and summer interns.

Airborne Separation Assurance System (ASAS)

- Selected Rockwell Collins' technical approach (modified potential field algorithms) to autonomous airspace deconfliction.
- Won Rockwell Collins business unit support (IR&D) to actively pursue development and industry demonstration of ASAS.

- Led Rockwell Collins' Conflict Detection and Resolution (CD&R) flight demonstrations in the Cargo Airline Associations' SafeFlight 21 ADS-B trials.
- Represented Rockwell Collins on the RTCA SC-186 CD&R Working Group, which has identified the concepts of operation and technical requirements for ASAS.

Flight Deck Speech Recognition

- Developed and test flew a speech recognition interface to a Controller-Pilot Data Link Communications (CPDLC) function.
- Funded by NASA AGATE program.

Avionics Embedded Diagnostics

- Sole software developer on an embedded evaluation engine for model-based diagnostics.

Joint University Research

Defined and oversaw the following university research projects:

- *Intelligent Cockpit Assistants* (Texas A&M University, Dr. John H Painter)
- *Algorithms for Resource Allocation under Dynamic Constraints* (Iowa State University, Dr. Eric Bartlett)
- *Neural Network Based Aircraft Identification* (Northwestern Polytechnic University, Xi'an, China, Professor Mingyi HE)
- *Synthetic Availability Analysis* (Beijing University of Aeronautics and Astronautics, Beijing, China, Professor Wang Shaoping)

Avionics System Training

Attended Rockwell Collins' sponsored classes in the following topics:

- Rockwell Collins Leadership Development Program
- Communication Navigation Surveillance (CNS) Air Traffic Management (ATM) Systems Overview
- DO-178B Software Certification Overview
- System Engineering Fundamentals
- Airborne Weather Radar Training

EzEdit.com Consultant

September 1998 to January 2001

- Sole software architect, developer, and support for a successful dot-com startup.
- Developed, deployed, and supported a turn-key web solution for small newspapers and broadcast media using Linux, Apache, MySQL, RealMedia server.

Texas A&M University Research Associate Assistant Lecturer Teaching Assistant

**June 1996 – August 1997
January 1996 – May 1996
September 1994 – December 1995**

- Worked with a team of engineers from academia and industry to develop a prototype pilot advisory system for general aviation aircraft. (NASA Langley funded).

- Developed novel technique for multi-dimensional fuzzy sets.
- Taught a junior-level introduction to electrical engineering course for one semester which included 100 engineering students.
- Substitute taught junior and senior-level engineering courses.
- Taught three semesters of electrical engineering labs.
- One patent awarded.

Rockwell Space Operations Company
Part-time Temporary Senior Engineer

June 1995 – August 1995

- Develop a Mission Control Center console tool to assist flight controllers in monitoring space station telemetry
- Received a "Technology Utilization Award" and NASA's "Space Act Monetary Award;"
- Received funding to continue graduate research at TAMU

Texas A&M University – Kingsville
Research Assistant
Engineering Tutor

September 1992 – August 1994

September 1991 – August 1992

- Performed research of intelligent control systems; wrote progress reports and technical reports for robotics and image processing toolbox
- Tutored calculus and engineering topics.

US PATENTS AWARDED

- | | |
|-----------|---|
| 6,650,275 | W. Kelly, T. Rand, S. Uckun, C. Ruokangas
<i>Image processing for hazard recognition in on-board weather radar</i> |
| 6,567,728 | W. Kelly, S. Uckun
<i>Terrain awareness system having nuisance alarm filter for use during approach.</i> |
| 6,525,674 | W. Kelly, S. Uckun
<i>Conditional Hazard Alerting Display.</i> |
| 6,452,511 | W. Kelly, S. Uckun
<i>Method and System for Providing Ground Proximity Warnings.</i> |
| 6,448,922 | W. Kelly
<i>Retrofit Solution for the Integration of Ground-based Weather Radar Images with On-board Weather Radar.</i> |
| 6,441,773 | W. Kelly, S. Uckun, T. Rand, C. Ruokangas
<i>Weather Radar System Integrating Ground-based Weather Radar with On-board Aircraft Weather Radar.</i> |

6,272,477 W. Kelly, J. Painter
Hypertrapezoidal Fuzzy Dynamic State Interpreter.

Additional, competition-sensitive patents are pending or in application preparation stage.

PUBLICATIONS

W. Kelly and J. Painter, "Flight Segment Identification as a Basis for Pilot Advisory Systems," AIAA Journal of Aircraft, paper accepted for publication.

W. Kelly, J. Valasek, D. Wilt, J. Deaton, K. Alter, R. Davis, "The Design and Evaluation of a Traffic Situation Display For a SATS Self Controlled Area", Proceedings of the 24th Digital Avionics Systems Conference, Washington, DC, 2005.

W. Kelly and J. Painter, "Flight Segment Identification as a Basis for Pilot Advisory Systems," Proceedings of the 5th AIAA Aviation, Technology, Integration, and Operations Conference (ATIO), Arlington, VA, 2005.

W. Kelly, J. Valasek, D. Wilt, J. Deaton, K. Alter, R. Davis, "The Design and Evaluation of a Traffic Situation Display For a SATS Self Controlled Area", Proceedings of the 24th Digital Avionics Systems Conference, Washington, D.C., 2005.

C. C. Ruokangas and W. E. Kelly III, "Advanced Weather Awareness and Reporting Enhancements", NASA Contract Report 2005-212993, March 2005.

W. Kelly, K. Kronfeld, and T. Rand, "Cockpit Integration of Uplinked Weather Radar Imagery," *19th Digital Avionics Systems Conference*, Philadelphia, PA, October 7-13, 2000.

W. Kelly and M. Eby, "Advances In Force Field Conflict Resolution Algorithms," *AIAA Guidance, Navigation, and Controls Conference*, Paper 2000-4360, Denver, CO, August 14-17, 2000.

W. Kelly, "Deconfliction of Multiple Autonomous Vehicles," *Unmanned Systems 2000*, Orlando, FL, July 11-13, 2000.

W. Kelly, "Conflict Detection and Alerting for Separation Assurance Systems", *18th Digital Avionics Systems Conference*, St. Louis, MO, October 1999.

M. Eby and W. Kelly, "Free Flight Separation Assurance Using Distributed Algorithms", *IEEE 1999 Aerospace Conference*, March 14-18, 1999.

J. Painter, W. Kelly, J. Trang, K. Lee, P. Branham, J. Crump, D. Ward, K. Krishnamurthy, D. Woo, W. Alcorn, and R. Yu, "Decision Support for the General Aviation Pilot", *Proceedings of the 1997 IEEE International Conference on Systems, Man, and Cybernetics*, Orlando, FL, October 12-15, 1997, pp. 88-93.

W. Kelly, *Dimensionality in Fuzzy Systems*, Ph.D. Dissertation, Texas A&M University, July 1997.

W. Kelly and J. Painter, "Soft Computing in the General Aviation Cockpit", *The First On-line Workshop on Soft Computing*, On the Internet, served by Nagoya University, Japan, August 19-30, 1996, pp. 151-156.

W. Kelly, R. Chaloo, R. McLauchlin, S. Omar, "Neuro-fuzzy Control of a Robotic Arm", *Artificial Neural Networks In Engineering*, 1996, St. Louis, MO, November 10, 1996, pp. 837-842.

W. Kelly and J. Painter, "Hypertrapezoidal Fuzzy Membership Functions", *5th IEEE International Conference on Fuzzy Systems*, New Orleans, September 8, 1996, pp. 1279-1284.

W. Kelly, *Neuro-fuzzy Control of a Robotic Arm*, Master's Thesis, 1994.

HONORS/AWARDS

Turning Goals Into Reality, NASA, 2005

Center Team Award, NASA Langley Research Center, 2005

Aviation Weather Technology Award, NASA Langley Research Center, 2004.

Technology Utilization Award, Rockwell Space Operations Company, 1996

Space Act Monetary Award, NASA Inventions and Contributions Board, 1996

NASA/TSGC Graduate Scholarship, TAMU, 1994

Graduated Summa Cum Laude, TAMU-K 1993

ONR Research Fellowship, 1992 – 1994

COURSES TAUGHT

(ELEN 214) Electrical Circuits Laboratory, Texas A&M Lab Instructor

(ELEN 306) Electrical Circuits and Instrumentation, Texas A&M Lecturer

(E.NET: C#) Essential .NET: Building Applications with C#, DevelopMentor Instructor