

Robert A. Hummel, Ph.D.

Email: bob@bobhummel.com

PROFESSIONAL EXPERIENCE

Potomac Institute for Policy Studies, Ballston, VA May 1, 2009-present
Chief Scientist and Vice President of Research, (On assignment, Sept 2016-Sept 2020)

Chief scientist involved in all studies and think tank work for the Institute which focuses on science and technology and policy for national investments in S&T. Management position with responsibility for delivery on studies, quality assurance, and research, and consulting for U.S. Government agencies and organizations. Current work for NASA, Air Force Acquisition, DOE, and NGA. Editor in Chief of *Science, Technology, Engineer Policy Studies (STEPS)* Magazine. Reports directly to the CEO on all technical matters of the Institute, as part of the Center for Revolutionary Scientific Thought. The group has worked for or interacted with DARPA, IARPA, ERDC, ONR, NASA, AF, and OSD (ASD(R&E)), including various subdivisions, and other clients on issues of national significance. Includes deep study in the field of microelectronics and supply chain trust. Earlier work includes alternative research directions for corrosion and degradation prevention, material science, and corrosion mitigation (authored a book), and big data and implications for machine intelligence (book in preparation, excerpt published). The not-for-profit Institute specializes in science and technology policies and directions, concerning national security issues facing society, and serves the public through thoughtful and meaningful analyses of policy options and challenges at the intersection of business and government.

**Inter-government Personnel Act (IPA) Agreement, assignment to
National Geospatial-Intelligence Agency (Research Directorate)** Sept 24, 2016-Sept 18, 2020
Senior Research Scientist

Assist Director of the Research Directorate, NGA, with project development, project assessments, strategy. Developed project plans and solicitations for exploitation capabilities for full motion video and motion imagery as obtained from surveillance assets. Develop plans for ATR projects. Develop plans for research projects in intelligence gathering concerning hypersonic vehicles. Developed and taught course on Project Development. Reinvigorated NGA's participation in DoD's SBIR/STTR programs. Managing a major NGA engagement with the University-Affiliated Research Center (UARC) at the University of Maryland. Mentoring NGA Research Directorate program managers.

US Technology Leadership Council, Ballston, VA May 1, 2014-April 30, 2015
Founder, President, and Chairman

A non-profit 501(c)6 industry association dedicated to promoting technology developments and offerings of industry members through dialogue and meetings between members and government and other industry guests. Meetings twice monthly with government speakers. With the successful founding of the association, duties were handed off to others, to permit continued work with the Potomac Institute and eventual start of a government IPA assignment.

Booz Allen Hamilton, McLean, VA June 2006-April 30, 2009
Principal, Defense S&T Team

Management position with responsibility for leadership, people development, and business development for a consulting and scientific and engineering and technical assistance division of a large technology and consulting firm. One of seven principals in a division encompassing 350+ staff serving DARPA, DHS/S&T, IARPA, and OSD/DDRE in a scientific and engineering technical assistance role, with particular responsibility for S&T service to the intelligence community and R&D organizations within the intelligence community. Engaged in proposal capture and development, teaming, market shaping, client consulting, and market strategy development. Prior to the separation of Booz Allen Hamilton from Booz & Co., a commercial management consulting firm, was part of the cross-team Innovation Strategy and Technology team, managing S&T services to commercial market delivery.

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- Conceived, captured, and provided program management of the SAR CCD project, for OSD/DDRE Rapid Reaction Technology Office, to integrate miniature SAR capabilities on a Class III UAV through system integration of component manufacturers.
- Co-capture lead for the (first) IARPA SETA contract, as the prime of a consortium of companies, to provide advice and start-up services to the ODNI's new Intelligence Advanced Research Projects Agency. Continued to provide consultation services to individual program managers and the office director.
- Proposal team and consultant to DARPA/IPTO (Information Processing Techniques Office). Provided direct consulting to the Office Director.
- Capture manager for a successful proposal to a classified customer on bio chemical threat studies.

Defense Advanced Research Projects Agency (DARPA), Arlington, VA	1997-2006
Program Manager, Information Exploitation Office	2001-2006
Program Manager, Special Projects Office	2000-2001
Program Manager, Information Systems Office	1997-2000

High-profile management position with responsibility for strategic planning, development, technical and operational management, and financial management of multiple R&D projects providing innovative technologies to meet national security challenges in intelligence, surveillance, and reconnaissance. Solicited and selected contractors, pioneering an innovative web-based proposal process, managed technology development to meet milestones and technical objectives, designed experiments and evaluation methods, and communicated progress to senior agency directors. Consistently successful in conceiving new project starts. Initiated a collaborative culture between the Agency, Air Force, Army and the Intelligence community (especially NGA) to drive forward cooperative research efforts and funding initiatives, and introduced research planning initiatives to ensure transitioning of technology to provide practical application. Program responsibilities incorporate imagery analysis, LADAR analysis, video exploitation, fundamental computer science, and SAR data analysis. Assisted in the alignment of agency strategy to national security needs through participation on senior strategy and technology panels. Led and emceed agency biennial technical symposium (DARPA Tech) to communicate DARPA directions and strategy to public in 2000, 2002, 2004, and 2005.

- Managed and directed the premier technology development and data acquisition project for automatic target recognition (ATR) using SAR imagery (the 5-year \$75M MSTAR project). Led a distributed collaborative team of government and contractor researchers through managed software module development and performance evaluations, and presented results at national "demonstrations." Implemented a transition program to operationalize ATR technology in Air Force exploitation systems.
- Conceived, developed, and secured funding for projects that revolutionize automatic target recognition by providing LADAR sensing capabilities (the Jigsaw project), and 3-D data exploitation capabilities (the E3D project), representing over \$67M in investments by DARPA and the Army Future Combat System (FCS) program. Provided an order of magnitude better performance against an order of magnitude larger number of potential targets than any previous ATR system.
- Conceived, developed, initiated, and managed the National/Tactical Exploitation project, securing \$22M in DARPA funding and \$4M in NGA funding, to provide advanced automated imagery exploitation tools for analysts to recognize air defense units and mobile missile threats using satellite and airborne sensor data. The project emplaced researchers in NGA operational facilities, and fostered the collaboration of researchers developing tools with operational analysts.
- Technical coordinator and emcee for each of the four DARPA Tech symposia from 2000 to 2005. Edited and scripted all speeches and graphics. Brought DARPA Tech to an unprecedented high professional level of technical communication by a government agency.
- Planned and executed an automated imagery exploitation operation during Operation Iraqi Freedom (March-April, 2003), providing direct support to ground troops by processing and analyzing over 12,000 images taken by airborne assets. Managed the team that established networks for data feeds, installed software, and examined system outputs during a 24/7 operation over five weeks.

- Key member of a Pentagon Counter Terrorism Technology Task Force team tasked to conceive and execute the “ISR Blitz,” wherein concentrated sensor assets were focused on a selected Iraqi “hot spot” during a two-month period in the fall of 2004.

New York University, Courant Institute of Mathematical Sciences, New York, New York

Associate Professor of Computer Science, tenured	1989-1997
Assistant Professor of Computer Science, tenure track	1982-1989
Postdoctoral Fellow, Department of Mathematics	1980-1982

Faculty position with teaching, research, and administrative and committee duties.

- Managed a sponsored research program in automatic target recognition (ATR); by 1997, this university project was funded at approximately \$1M per year.
- Director of the Masters Program in Computer Science (1994-97), and developed and co-directed a joint Masters program with the Information Sciences Department of the Stern School of Business. By 1997, the MS in IS program had 50 enrolled graduate students.
- Manager of the Courant Institute Systems Administration Group, handling sysadmin duties for Unix computers and networks throughout the Institute; four overworked staff members.
- Published in the fields of image processing and computer vision, uncertainty reasoning, robotics, and parallel computing, with over 70 journal articles, book chapters, and refereed conference papers.

Hummel Enterprises, New York, New York 1977-1999

Independent consulting and professional development. Major consulting efforts included:

Gas Research Institute	1995-1999
Institute for Defense Analyses	1991-2001
I-Math Associates (part owner)	1986-1995
I.B.M. Systems Research Institute	1983-1988
Martin Marietta Orlando Aerospace	1981-1984

- Developed courseware and presented to corporate and professional clients on image processing, parallel computing, and automatic target recognition technologies
- Advised natural gas industries on research investments of \$200M annually in basic and applied gas technologies as part of the Research Coordination Council (1995-99)
- Proposed and help manage SBIR contracts to I-Math Associates.
- Member of the third class (1992-3) of the Institute for Defense Analyses’ “Defense Science Study Group.”
- Consultant to the DSB (summer study, 1995); Member of the Navy Studies Board (NSB), 1995-97.

EDUCATION

Ph.D., Mathematics, University of Minnesota, 1980, PhD thesis on computational fluid mechanics.

Bachelor of Science, Mathematics, University of Chicago, 1975

PROFESSIONAL PROFILE

Affiliations	Naval Studies Board (1995-97), Consultant to the Defense Science Board, 1995 Affiliate researcher, NYU Center for Neural Science, 1990-95
Sabbaticals	Vrije Universiteit, Amsterdam, Netherlands (CY 1989), and INRIA, Paris, France, 1991-92
Award	Recipient of the DARPA “Director’s Award,” for “Outstanding Personal Accomplishment,” 2005