

One World or Two?

Can the Research Community and the Manufacturers Work More Efficiently Together?

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Abstract

The panel will address the relationships between the HF (Human Factors) research community in aviation and aircraft and avionics manufacturers and look at how the two communities could work more efficiently together.

The panelists come from both worlds — some of them with a foot in both camps — and have all past experiences of interaction, cooperation, or contracts with the other party.

Introduction

The Human Factors (HF) research community and aircraft and avionics manufacturers have been interacting and exchanging information for many years. The two communities are focused on the same technical objects and systems but usually address them from different points of view, and with different methods and interests.

Are those two approaches complementary (“one world”) or antagonistic (“two worlds”)?

To address this question we will bring together seven participants with interesting viewpoints, experiences and testimonies. They come from the best of both worlds — Airbus, Boeing, Honeywell, NASA — and have all been involved in joint projects, where researchers and manufacturers worked hand in hand, or in research contracts sponsored by the industry. Some of them, now working for a manufacturer, were dedicated human factors researchers a few years ago. An interesting experience.

Topics

We will address the following topics during our discussion:

- What are the manufacturers' needs in terms of research? Do they need to collaborate with HF researchers or can they solely rely on their own R&D departments? Is academic research misguided or sometimes useless? Are there examples of successful external researches with an impact in the cockpit? Is the literature on HF in aviation used at Airbus, Boeing or Honeywell? Do the manufacturer's HF people meet internal resistances against the introduction of human factors in their companies?
- Do the researchers need to collaborate with the industry? Are there research subjects that can only be addressed if a manufacturer is involved? Can the researchers impact the manufacturers solely with scientific publications (including participation to conferences)?
- What makes research contracts sponsored by the industry successful or unsuccessful? Do researchers and industrials speak the same language? Do they understand each others' interests and objectives? What can we recommend to researchers or industrials willing to install collaboration?
- And finally, how can the HF research in aviation and the aircraft and avionics manufacturers work more efficiently together?

Panel Members

Terry Allard

Dr. Terry Allard was hired as Chief of the NASA Ames Research Center Human Factors Research and Technology Division in November 1999 and admitted into the Senior Executive Service in August 2000. Research efforts within his division address near-term and long-range challenges in aerospace human factors and human information processing. Research topics range from individual human information processing mechanisms and advanced display interaction technologies to studies of individual and team decision-making, distributed collaboration and aviation system risk management. Dr. Allard is on the Editorial Boards of PRESENCE: Teleoperators and Virtual Environments, and the International Journal of Human-Computer Interaction. He is a member of the NATO Information Systems Technology panel and is on the Management Review Board of the US Army Collaborative Technology Alliance for Advanced Decision Architectures. Dr. Allard was a Program Officer at the Office of Naval Research (ONR) from 1990–1999, managing basic and applied research programs in such areas as advanced interfaces, virtual reality, computational models of human-system performance, intelligent tutoring systems and human-centered systems engineering. While at ONR, he managed a broad-based science and technology partnership between ONR and the Naval Sea Systems Command to reduce workload and optimize crew allocation on Navy surface ships. He is a charter member of the US Navy Smart Ship Project that received the Vice President's Hammer Award for Reinventing Government. He has received the Naval Civilian Meritorious Service Medal, a Navy Unit Commendation and Certificates of Commendation from the Office of Naval Research and was a member of the inaugural Defense Leadership and Management Program (DLAMP). Dr. Allard received his Ph.D. from the Massachusetts Institute of Technology in Psychology and Brain Science (1984) and post-doctoral training in neurophysiology and animal behavior at the University of California, San Francisco. He received the David D. Henry Award as outstanding graduate of his Wayne State University graduating class and has been a member of the Phi Beta Kappa, Sigma Xi and Psi Chi honor societies, the Human Factors and Ergonomics Society and the American Institute of Aeronautics and Astronautics.

Asaf Degani

Asaf Degani received a M.S degree in Ergonomics from the University of Miami and a Ph.D. in Industrial and Systems Engineering from Georgia Institute of Technology, Atlanta. He holds a private pilot license and a maritime Captain ticket (international). Since 1989 he has worked as a research scientist at the Human Factors Division at NASA Ames. Primary research topics are in human interaction with automation, modeling and formal methods for verification and design, procedures development and cockpit displays.

Barbara Holder

Barbara Holder received a Ph.D. in Cognitive Science from the University of California, San Diego. She recently joined The Boeing Company where she conducts research as a Human Factors Specialist. Before coming to Boeing she was a postdoctoral researcher in the Distributed Cognition and Human-Computer Interaction laboratory at the University of California, San Diego where she was involved in a study to

understand how pilots acquire expertise in operating the autoflight system of the Airbus A320. Barbara's primary research topics are in flight crew performance, human interaction with automation, cockpit display design, and procedures development. In addition, Barbara is a general aviation pilot.

Denis Javaux (Panel Moderator)

Denis Javaux has been a researcher in cognitive ergonomics for the last 12 years at the University of Liège, Belgium. His main research topics are human interaction with automation, automation behavior modeling and automation complexity. He is currently involved in the development of a method for evaluating the complexity of autopilot behavior. He has worked on these issues in the framework of research contracts for the DGAC (French Civil Aviation), Airbus Industrie and Belgian scientific agencies. He has also been a consultant to the industry for the last 8 years with active participation to more than 50 industrial projects.

Brian Kelly

Brian D. Kelly, Boeing Commercial Airplanes, Technical Fellow, Flight Crew Operations Integration. Brian is currently involved in development of future flight deck configurations and concepts, and represents Boeing on the Human Factors Harmonization Working Group developing rules and guidance for certification of flight decks and crew interfaces.

Florence Reuzeau

Florence Reuzeau received a M.S. in Mechanical & Aeronautical Engineering (E.N.S.I.C.A., Toulouse) and a Ph.D. in Cognitive Ergonomics (C.N.A.M., Paris). She manages the human factors department at Airbus France: her department contributes to take human factors into account, proposing suitable methods for aircraft design along with the introduction of novel design concepts. In addition, Florence is an active member of the operational Human Factors Group at Airbus Industrie: this group covers certification, design, maintenance, training and operations activities. Moreover, she is involved in all the major human factors international stakeholders, standardization committees, airworthiness authorities groups (JAA human factors steering group, Human Factors Harmonization Working Group, AECMA) to provide continuous support and improve safety through the design method.

Lance Sherry

Lance Sherry is a Program Manager in the Honeywell — Commercial Aviation Research Group. He has served as a flight test avionics engineer, systems engineer, software engineer, and project manager in the design, test and certification of commercial air transport systems for over sixteen years. During this time he has conducted R&D funded by NASA, FAA, RAND, and corporate clients. This research includes Human Factors, automatic code-generation, machine-learning, supply chain, and project cost estimation and management. Dr Sherry, a graduate of Brown University (B.Sc. — electrical engineering) and Arizona State University (Ph.D. — industrial engineering), has published over 50 papers, holds several U.S. and European patents, and was a Fellow of the American Association for the Advancement of Science (1999/2000).