



**Human  
Factors  
and  
Ergonomics  
Society**

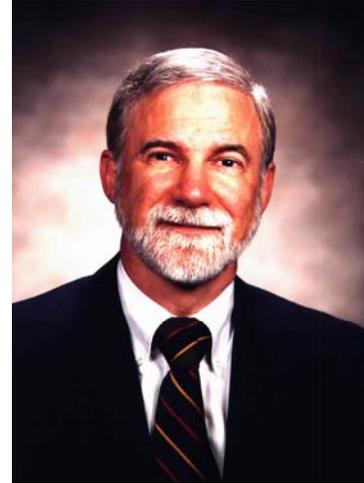
## FELLOW PROFILE

**Name:** Charles N. Abernethy

**Degrees, certifications,  
etc.:** BSEE, Carnegie Institute  
of Technology (now  
CMU).  
PhD, MS, in Experimental  
Psychology with Statistics  
Minor, The Pennsylvania  
State University

FHFES, CHFP

**Current status:** Consulting



### **Biography (How you got involved in the field, your major career activities and milestones):**

While in engineering school, just as vacuum tubes were phasing out to transistors, and each university had 1 computer, I found myself dumping all the engineering books and reading history, psychology, economics, some philosophy, and other behavioral books. I also realized I was about the only one doing that. I graduated and worked for about a year as an engineer while taking adjunct courses in psychology at nearby Pennsylvania State University (PSU). Somewhere in there I learned of an area called human factors engineering which would combine my two interests. Although there was not a specific HF program at that time at PSU, there was a confluence of Bob Seibel, Lowell Schipper, Don Trumbo, and Hersh Leibowitz (Advisor), all in HF related areas. I became a graduate student in Experimental Psychology there, taking statistical communication theory from the EE department, statistics from the math department, experimental design and analysis from the psychology department, etc. I even did a paper for (Bob Freeman's) Sensory Psychology course, on how bats actually use sonar, netting me an outside thesis committee member from the biology department. The thesis was on divided attention allocation under stress.

Upon completion of my Ph.D. at PSU, there were essentially no funded academic positions available (just after Kent State). However, the newly founded U.S. Department of Transportation had just launched a research center in Cambridge MA. There I worked on such issues as coast guard buoy conspicuity, drunk driving, air traffic control display and user interface, ride quality, elder/access, medical standards for railroad engineers, grade crossings, vessel traffic control, transit vehicle headway/braking and seat design

parameters, fuel economy, etc. That the government does not produce products *per se*, and findings went into government reports (which are available) and only sometimes into peer-reviewed publications, lead me to search elsewhere. An opportunity appeared at a computer company's headquarters in a nearby old woolen mill.

At the prior year's Boston Computer Society's exhibition, two guys were holding up a computer board and I realized this was a home/hobby computer kit. Computers were about to go into the hands of the general public. When I interviewed at Digital Equipment Corporation, they were looking for knobs and dials; they had no human factors.

I arrived, raised the discipline, started hiring, and we had the opportunity to participate in this major cultural revolution through product design and standards development. The products included keyboards, display image quality, round mouse design, antiglare, several PCs and laptops, accessories and furniture, user documentation, and we slowly moved into software user interface design

I eventually became a Senior Consultant Engineer, one of twenty some in the company, doing special projects like following up on the effectiveness of external research spending, including looking at a wide range of HF related labs across the country. In a series of meetings with the CEO in 1989 and 1990, it became clear that the low volume, high margin business model was not to change, despite the evidence.

During this period my spouse became tenured (which is not portable), and I was heavily involved in other areas, including accessibility standards for U.S. government purchases. After Compaq bought Digital, I left to become an independent consultant, which I still am.

My clients have been the actual users of the technology we had been designing. They needed help with software design, work layout, self installation, initial use, web-based user information, standards interpretation, new product evaluation, and for one client, design and packaging of a corporate product. A recent client provided the opportunity to work directly in the medical field evaluating usability for quality standard compliance, for health record information, and investigating medical information systems to form the basis for their user information architecture. Several cultures are struggling to utilize the power of digital information technology to boost the effectiveness of medical delivery systems.

I also enjoy teaching/tutoring and writing about experimental design, data treatment and interpretation-- appeals to my math inclinations.

### **Employment History (List top 5 positions):**

1. Behavioural Implications Management, working with such clients as Blue Cross Blue Shield of MA, J. Stalker Institute, Verizon Labs, BMC Software, HP, Dell, NCR, Oracle, and others.

2. Digital Equipment Corporation, Senior Consultant Engineer, founder/manager of multi-discipline/multi-national human factors group doing product design, then standards work.

3. U.S. Department of Transportation, Transportation Systems Center (now Volpe Center),

Cambridge MA, Engineering Psychologist, Behavioral Systems Branch. Management of behavioral research in such transportation topics as listed in the Bio above.

4. Pennsylvania State University, vision research, TA or teaching Intermediate Experimental Design, Introductory Experimental Psychology, and Introductory Psychology.

5. University of Phoenix, Graduate and Undergraduate Introduction, Intermediate, and Advanced Statistics.

### **What were your significant contributions to the field?**

- Visual Divided Attention Alcohol Safety Interlock System, with others, (Essentially this patent was the publication of my doctoral thesis in divided attention allocation under stress.)
- Design for Keyboard (LK201) US and Foreign Patents, with others.
- Product Design: desktop, laptop computers and peripherals.
- Founding and managing a diverse human factors group at Digital Equipment Corporation at that time in IT history.
- National and International Standards: ANSI/HFS 100; European Computer Manufacturers Association (ECMA) standards for monochrome (110), color (126), and non-crt displays (136); ISO 9241; ISO 13406 flat panel displays, ETAAC Accessibility (Section 508), comments on drafts for HFES 200, and others. Medical Standards for Railroad Engineers (U.S.).
- Computer Simulation of U.S. Coast Guard Watchstander Performance.
- Ride Quality leading to seat pan design and ISO 2631 standard.
- Helping clients and end users who are the users of IT.

### **Did you receive any notable awards or recognition during your career?**

Fellow of the Human Factors and Ergonomics Society.

Industrial Design Society of America (IDSA) DIGITAL Portable Workstation Silver Design Award, with others.

The Industrial Design Magazine Award for Digital's LK201 Keyboard, with others.

Special Award of Appreciation for Technological Achievement, U.S. Department of Transportation.

### **Which articles in the journal *Human Factors* would you say were the most influential to you and your research or practice?**

The framework for engineering education at CIT (now CMU) was to understand the overarching principles and derive the rest. Human Factors has an overarching principle to uncover and apply the mechanisms that drive human behavior. So, there is no particular reference or set of references.

### **What advice would you give someone considering HF/E as a profession?**

I am continually impressed by the caliber of those now entering the profession and their very strong education. I have served as the NEC Student Conference Program Director for about a decade now and had served on the Jerome H. Ely Award for Best Journal Article selection committee prior to that. What I see is very impressive, especially considering our

early struggles to get this discipline understood and accepted.

My first interest was in the design of products that the general public actually used, and I found that you have to work on the whole product design -- a creative cross-discipline process. So you have to understand and appreciate the other disciplines and, sometimes, cultures involved. Be polite. I later found that the technology changes rapidly but the human interface needs evolve more slowly; and that standards can capture and carry these needs better and longer than the products themselves.