



**Human
Factors
and
Ergonomics
Society**

FELLOW PROFILE

Name: Paul Allan Green

**Degrees,
certifications,
etc.:** Certified Human Factors Professional, Board
of Certification in Professional Ergonomics,
2008

PhD, Industrial & Operations Engineering
and Psychology (joint degree), 1979,
University of Michigan

M.A., Psychology, 1979, University of
Michigan

M.S.E., University of Michigan, 1972,
Industrial and Operations Engineering,
University of Michigan

B.S., Mechanical Engineering, 1972, Drexel
University

**Current
status:** Research Professor, University of Michigan
Transportation Research Institute, Driver
Interface Group

Adjunct Associate Professor, Industrial and
Operations Engineering, University of
Michigan

Homepage: www.umich.edu/~driving



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

I started out as a student in mechanical engineering at Drexel University in Philadelphia. I was fortunate to have a co-op position at the Philadelphia Naval Shipyard throughout the five years of my undergraduate education. There, I worked on the design of ships (boilers, missile elevators, submarine air systems, etc.), which gave me an appreciation for the importance of human factors. Determining how many bolts and of what size were required to secure an access cover was a table look up problem any engineer or technician could solve. However, no one knew how to design a water-level display for the boiler feedwater tank that could be read by sailors when lighting was poor, they were tired, and the compartment temperature was excessive. Repeatedly, the most challenging, interesting, and important problems were associated with sailors and their interaction with the equipment on board. That led me to take a human engineering course from Carl Silver at Drexel, a true inspiration, and to be the human factors contributor for a student team designing a fuel-efficient vehicle.

Wanting to learn more about human factors engineering, I enrolled in the graduate program in Industrial and Operations Engineering at the University of Michigan, working with Jim Miller.

That opportunity, along with a fellowship from NIOSH, gave me exposure to the occupational world, spending two summers working at a lighting factory in Philadelphia as the safety and health engineer. Working with Gary Langolf and Dick Pew (and later Dan Weintraub). I formulated an individual, interdepartmental degree program, resulting in a joint Ph.D. in Industrial & Operations Engineering and Psychology from the University of Michigan.

My dissertation concerned symbols for vehicle controls and displays, and Dick Pew was on the responsible Society of Automotive Engineers Human Factors Committee. Furthermore, the related International Standards Organization committee happened to meet in Ann Arbor while I was in graduate school, providing me with the opportunity to meet with key people developing standards for symbols. Another important opportunity was helping Dick Pew with the Human Factors Engineering Short Course, which I now oversee and say more about later.

For me, interacting with my professional colleagues is critical, even if it is just listening, so in 1974 I began attending the Human Factors Society Annual Meeting, which I have done every year since then, sometimes using my own funding. Dick Pew (then HFES President), sensing my interest in the profession, appointed me to chair a one-person committee, Interorganizational Relations, which provided me with the opportunity to meet senior members of the society. Over time, that led to a series of other roles in the Society as a program chair and newsletter editor for the local chapter, program chair for the Computer Systems Technical Group, chair of the Awards Committee, Secretary-Treasurer of HFES, chair of the Publications Committee, President of HFES, and currently as a member of the Executive Council.

After graduating from Michigan, I considered several academic and industrial positions, but decided to accept a research position at the then Highway Safety Research Institute (HSRI) because of my desire to continue conducting automotive research, have Paul Olson as my supervisor, and live in Ann Arbor. Over the years, I have had several job titles reflecting increasing professional stature and changes in what the university decided to call researchers of various ilk. My current title is research professor, which could be described as the equivalent of a full professor (actually a professor), but without tenure or sabbaticals, and no formal requirement to teach.

Nonetheless, almost immediately after I got settled at HSRI, now the University of Michigan Transportation Research Institute (UMTRI), I was asked to teach. In fact, since then I have taught a course every regular academic semester, starting with the senior level introductory human factors course, then teaching the introductory ergonomics laboratory (for 25 years), and now for many years, the human-computer interaction course and the automotive human factors course.

As I noted earlier, I also teach the Human Factors Engineering Short Course, a unique course for industry that is taught the last week in July/first week in August for practicing human factors professionals. Meeting those 50+ students every year continues to give me an understanding of the day-to-day issues practicing human factors professionals face and reinforces my respect for them, as well as providing a focus for my research. I have learned a great deal from students about aircraft cockpits, control rooms, medical devices, web sites, and the wide range of topics and applications in which human factors professionals have been involved. Further, the course has provided me with the opportunity to learn from the course lecturers—Al Chapanis, Julien Christensen, Dick Pew, Harry Snyder, Bob Willigies, John Gould, Bill Marras, Mica Endsley, Debbie Boehm-Davis, Chris Wickens, and many others.

Finally, my research. My research has concerned driver interfaces, navigation systems, driver workload, and related topics. At the moment, driver distraction is the trendy name for this topic. More important than the specific findings have been the consequences--three SAE

Recommended Practices for which I was the lead author. SAE J2364, the 15-second rule, specifies 2 methods for determining if a task should be performed while driving. SAE J2365 describes a method to estimate task time based on MTM-1 (a predetermined time system used by industrial engineers, originally to study factory work), the Keystroke-Level Model (from human-computer interaction), and our own research. SAE J2944 driver performance measures and statistics, specifies how headway, gap, CG gap, lane departures, time to collision, and how a host of other measures should be defined. Currently, multiple names are used for many of these measures, and when defined, which is rarely the case, they are not defined consistently. As a consequence, many driving studies are not replicable, a situation that should change quite soon as a result of this standard.

However, my greatest source of pride is the more than 60 undergraduate and graduate students I have worked with, who have gone on to successful careers as human factors engineers and industrial engineers, making products and services that are more human centered, and enjoying doing it.

Employment History (List top 5 positions):

2010-present	Research Professor, UMTRI Driver Interface Group, U. of Michigan (and leader, Driver Interface Group)
2007-2008	Adjunct Associate Professor, School of Information, U. of Michigan
2004-2010	Research Professor, UMTRI Human Factors Division, U. of Michigan
1998-2004	Senior Research Scientist, Human Factors Div., UMTRI
1993-present	Adjunct Associate Professor, Department of Industrial and Operations Engineering, U. of Michigan

Note: UMTRI = University of Michigan Transportation Research Institute

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

The most important prior award was being made a fellow in the Ergonomics Society (now the Institute for Ergonomics and Human Factors), and, of course, now as an HFES fellow.

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

Alphonse Chapanis, (1964). Words, Words, Words, *Human Factors*, 7, 1-17.
Sidney Smith (1979). Letter Size and Legibility, *Human Factors*, 21(6), 661-670.

Both of these articles deal with classic, practical problems of human factors, but simply and elegantly, also present solutions. Although they are now decades old, they have not lost their relevance.

Please provide any links to your online articles, essays, blogs, Wikipedia pages, etc., that pertain to your research, publications or practice.

www.umich.edu/~driving

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

Start by going to the best university you can

College helps you figure out what you want to do with your life and provides you with the initial preparation to get there. It is an investment in the future, and you want to put yourself in the most intellectually stimulating environment you can find, with faculty and colleagues who are much smarter than you are. Those 4 years (or in my case 12 with graduate school) determine what will happen in the remaining 40-60 years.

Never stop reading - Read, read, read (or read cubed)

There is acceptance, especially among undergraduate students, of what is known as the empty vessel model of education. Students are passive recipients of information, with knowledge being poured into them. They go to class, do homework, take tests, and after four years of this, they are done. After that, they do what their employer asks, and learn only what they need to do their job.

This flawed model of learning is quite different from that of other professions such as medicine and law. In those professions, one needs to always be reading or learning on their own. My recommendation is that all human factors and ergonomics professionals should spend a few hours reading every week. That could be books, journal articles, or other technical material. Hopefully, this habit was established in high school, continues over summer and other breaks, and even occurs, if intermittently, during the school year.

Go to professional meetings and participate in professional societies

In addition to reading, one learns from colleagues at professional meetings and by working with them on professional activities. This network of colleagues will help you find information and jobs, and provide all sorts of opportunities, things one cannot do as efficiently using Google or other Internet resources. However, the greatest joys are not what others can do for you, but what you can do for others who share your passion for the profession.