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# THE Interface

QUARTERLY  
NEWSLETTER OF THE  
HUMAN FACTORS &  
ERGONOMICS SOCIETY  
SOUTH JERSEY  
CHAPTER

JUNE 2006

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## We're heating up this summer

*Chapter Tours, Presentations, and Community Outreach*



## Chapter Tour of AFTIL

**By Carolina Zingale**

On May 10, chapter members took a field trip to the Airport Facilities Terminal Integration Laboratory (AFTIL) located on English Creek Avenue. A few of us had never been there before, and others hadn't been there in quite a while. We learned a lot and were impressed by the capabilities! The folks who gave us the tour were very enthusiastic about their work and happy to answer our questions.

The AFTIL provides support for the design and layout of control towers including site location, tower height, orientation, and interior layout. The facility simulates a tower cab with a 360 degree out-the-window display. We were able to view scenes from several towers including LaGuardia, Tampa, Wilkes-Barre, Indianapolis, Aspen, and Jefferson County (Colorado). The scenes include surrounding structures (e.g., stadiums), terrain (e.g., mountains), arrival and departure traffic, and traffic on taxiways and runways. We were able to view the scenes from different vantage points rep-

resenting potential tower site locations. We also saw a few scenes under different weather conditions.

The AFTIL works with teams of engineers, program managers, controllers, technical operations specialists, and others from different tower facilities. The AFTIL typically implements an existing tower configuration, runways, etc., and then includes alternative locations and heights of proposed towers at other sites on the airport. The team members can view traffic from the different perspectives to help them make decisions about the most appropriate configuration. Traffic scenarios are built based on actual traffic capabilities and airport procedures. The scenes can be modified to include proposed taxiways, runways, and buildings so that the future state of the airport can be displayed. Issues such as whether a location has ready access to water, sewer, etc. also factor into the decisions as do environmental issues. One proposed tower location would have provided excellent visibility but was on a swamp!

The AFTIL also includes wooden and foam mockups of the tower work area. These mockups allow personnel from the facilities to move and reconfigure individual components of each workstation to view different layouts. The mockups are scaled to the size of the facility and the planned needs. Simulations and mockups may take several weeks to months to develop depending

on complexity.

## Mark Your Calendar!

On Wednesday, June 21, Bruce Rosenberg will present "An introduction to signal detection statistics and receiver operating characteristic curve." The presentation will take place in the Fish Bowl, Building 300 (that's the room behind the big screen TV in the main building atrium). We will serve pizza for \$2.00 a slice (includes soda).

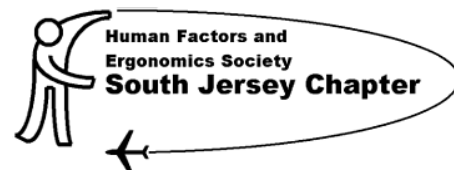
Upcoming chapter events:

July 11 – Jersey Shore Science Fair & Student Inventions Through Education winners will make presentations to the chapter in the RDHFL Briefing Room.

August – Presentation by Bart Brickman & Tanya Yuditsky

September – Chapter picnic

October – National Ergonomics Month



<http://www.sjhfes.org/>

# Air Traffic Control & Patient Safety

By Bonnie Kudrick

On April 5, 2006, Dr. Frank Durso of Texas Tech University gave a presentation to the South Jersey Chapter of the Human Factors and Ergonomics Society entitled, "Can Air Traffic Control Improve Patient Safety?" Dr. Durso presented some interesting insights into the safety measures in air traffic control (ATC) and how they might be applied to medical settings. First, Dr. Durso discussed the similarities that exist between the medical field and ATC. As an example, anesthetists use paper strips to keep track of their patients, much like controllers use flight strips to keep track of aircraft. Both professions employ intelligent people who are responsible for people's safety, and both professions require intensive training where the demands and rewards are high.

Dr. Durso also discussed the differences between the medical field and ATC. One difference is that ATC has an independent body that conducts investigations when things go wrong, whereas the medical profession does not. Another is that ATC reports near misses which assist in identifying areas that need to be corrected; the medical profession does not do this for fear of lawsuits. In general, ATC has more open and extensive reporting than the medical profession.

Dr. Durso suggested that the medical field could learn a great deal from the procedures, tasks, technology, and systems of ATC. He proposed that the medical field should have an independent body to investigate medical mishaps and misjudgments and that there should be open reporting of mistakes to better protect the patient.

Dr. Durso's professional interests lie in applied cognition, primarily air traffic control. He is the co-author of *The*

*Handbook of Applied Cognition* and oversees the Cognitive Ergonomics Lab at Texas Tech University where he enjoys supervising graduate and undergraduate research projects.



Professor Frank Durso (Photo by Kate McDevitt)

## Young Inventors

By Todd Truitt

The Student Inventions Through Education (SITE) competition took place at the Technical Center on April 28, 2006. The SITE program encourages creative thinking and problem solving skills among students. The SITE competition, sponsored by the Educational Information and Resource Center's ([www.eirc.org](http://www.eirc.org)) National Talent Network, is an opportunity for students to present their own inventions or innovations in local and regional competitions. This year's competition at the Technical Center included four age divisions of grades K-2, 3-4, 5-6, and 7-8. It was my privilege to serve as a judge again for this year's competition. Having judged the competition for the last four years, I am still amazed by the ideas that these kids generate. Our South Jersey Chapter of the HFES sponsored prizes for the winners this year. We provided bookstore gift cards to each winner and invited them to present their winning invention or innovation to the chapter. Some of the young inventors have already agreed to make presentations. Watch for the date of this upcoming event - I'll see you there!

# Annual Membership Drive

By Anton Koros

To join the chapter or renew your membership, please complete the form included in this newsletter and/or contact Anton Koros or Carolina Zingale. New this year - you can also renew your membership through PayPal at the chapter's website at <http://www.sjhfes.org/membership.htm> New memberships and renewals for folks in Bldg 300 and 316 can also be dropped off to Karen Peio, Bldg 316 3Z20, x8132. Looking forward to seeing you at the meetings!

## Upcoming National Events

By Carolina Zingale

### Aug. 10-13, 2006

American Psychological Association Annual Meeting  
Ernest N. Morial Convention Center  
New Orleans, LA  
<http://www.apa.org/convention06/homepage.html>

### Aug. 29-31, 2006

Association for Unmanned Vehicle Systems International (AUVSI) 2006  
Gaylord Palms Resort & Convention Center  
Orlando, FL  
<http://www.auvsi.com>

### Sept. 6-9, 2006

30th Meeting of the American Society of Biomechanics  
Inn at Virginia Tech and Conference Center  
Blacksburg, VA,  
<http://asb2006.org>

### October 16-20, 2006

HFES Annual Meeting - 50th Anniver-

sary  
Hilton  
San Francisco, CA  
<http://www.hfes.org/web/HFESMeetings/meetings.html>

## Treasurer's Report

By **Bonnie Kudrick**

As of May 2006, we have \$805.37 in checking, \$329.57 in savings, and \$88.27 in petty cash for a total balance of \$1223.21.

## Member Publications

By **Todd R. Truitt**

Congratulations to our chapter members who have published papers since the last issue of *The Interface*. Listed below are the citations and abstracts. If you have published an article, paper, or book review lately, please let us know so we can share the news.

Ahlstrom, U., & Friedman-Berg, F. (2006). *Controller scan-path behavior during severe weather avoidance* (DOT/FAA/TC-06/07). Atlantic City International Airport, NJ: Federal Aviation Administration William J. Hughes Technical Center.

### Abstract

In the present study, we examined controllers' fixation behavior on Storm Motion tools during severe weather avoidance. The data consisted of eye movement recordings from time intervals when controllers activated a static or a dynamic Storm Motion tool. Both of these tools provided information about the direction of storm cell motion and future extrapolated positions of the storm cell leading edge. By analyzing the location and extent of fixations, we performed an assessment to identify the static weather tool features that captured controllers' visual attention (i.e., areas of

visual interest). Second, we analyzed controller scan path behavior (a series of fixations and saccades) while they were using the static and the dynamic tools. Third, we assessed controller fixation prioritization strategies during static tool usage. Our analysis revealed that controllers focused their visual attention significantly more on the area between the storm cell leading edge and the 10 minute extrapolated position compared to other areas of the static Storm Motion tool. With regards to controller scan paths, we found that dynamic Storm Motion tools significantly reduced controller scan path areas, scan path distances, and scan path durations compared to the static tool. Furthermore, the mean pupil diameter was significantly larger for controllers while using the static tool compared to the dynamic tool, indicating a higher visual and cognitive workload during this display condition. We found little evidence for systematic controller fixation behavior while they were using the static tool. The few systematic patterns that we revealed were two-step fixation patterns (e.g., aircraft → 10 minute extrapolated position), and the vast majority of fixation orders (patterns) were unique to each individual controller. Evidently, the static Storm Motion tool provided weak affordances to controllers during tactical operations. We discuss these results in relation to the attentional capture phenomenon and suggest possible ways to improve static Storm Motion tools for tactical operations.

Allendoerfer, K. R., Zingale, C., Pai, S., & Willems, B. (2006). *En route air traffic controller commands: Frequency of use during routine operations* (DOT/FAA/TC-TN06/04). Atlantic City International Airport, NJ: Federal Aviation Administration William J. Hughes Technical Center.

### Abstract

The Federal Aviation Administration has started development of the En route Automation Modernization (ERAM) system to replace the current en route system consisting of the Host Computer

System, Display System Replacement (DSR), and the User Request Evaluation Tool. ERAM will provide a variety of new user interface (UI) capabilities for accessing and executing controller commands. An appropriate evaluation of the new UI capabilities will determine how effectively controllers are able to work with the new system. This technical note documents the frequency of use of controller commands using the legacy system. We calculated the number of each entry type made per hour in an 11-hour period at a field site and found that the most frequently used commands were: 1) Offset Datablock, 2) Implied Aircraft Selection (i.e., Accept Handoff/Force Datablock), 3) Initiate Handoff, and 4) Assign Interim Altitude. The 30 most frequently used commands made up approximately 95% of the total number of controller entries. We recommend that future test activities target these most frequent commands. We discuss future phases of the project and ways that these data can be used to compare ERAM to the legacy system.

Koros, A., Della Rocco, P. S., Panjwani, G., Ingurgio, V., & D'Arcy, J. F. (2006). *Complexity in airport traffic control towers: A field study. Part 2. Controller strategies and information requirements* (DOT/FAA/TC-06/22). Atlantic City International Airport, NJ: Federal Aviation Administration William J. Hughes Technical Center.

### Abstract

This two-part field study investigated sources of complexity and their incidence within Federal Aviation Administration Air Traffic Control Towers (ATCTs). Human Factors Specialists from the William J. Hughes Technical Center selected six sites representing a combination of high traffic volume, traffic mix, and/or converging runways. Sixty-two Air Traffic Control Specialists participated in the study, providing ratings and descriptions of the complexity sources from a local- and ground-controller perspective. The first report represented a key step in identifying and characterizing the primary sources of complexity within ATCTs and

assessing their relative incidence and importance. The second report identifies the strategies that tower controllers use to mitigate complexity, the types of information that they require, and the sources of this information. The participants reported relying on two to three core strategies, which they supplemented with ad hoc techniques. Results from this field study hold implications for future tower automation equipment design. Future research efforts should systematically investigate tower controller information needs and focus, in particular, on sources such as high traffic volume and frequency congestion, which are among the most prevalent sources of complexity within this environment.

Stein, E. S., Della Rocco, P. S., & Sollenberger, R. L. (2006). *Dynamic resectorization in air traffic control: A human factors perspective* (DOT/FAA/TC-TN06/19). Atlantic City International Airport, NJ: Federal Aviation Administration William J. Hughes Technical Center.

#### Abstract

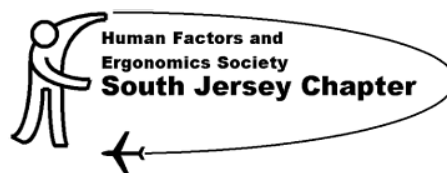
The National Airspace System is a highly structured environment. Structure provides benefits including predictability for the decision maker, the air traffic controller. When something is unusual, controllers can identify the event as out of the ordinary given their inherent and trained capacity for pattern recognition. The expertise in pattern recognition does not develop quickly. In the current system, it takes En route controllers an average of about three years to certify as Certified Professional Controllers (CPCs, formerly Full Performance Level). In general, CPCs must learn and check out on at least six different sectors to certify. There are situations, however, when the usual structure is reduced and the typical patterns do not work. This can happen with weather events and systems outages as examples. Dynamic resectorization offers a tool in these situations to increase the options and promote flexibility. In our current system, traffic managers can resectorize in a very systematic, structured way to balance the load and increase the

level of structure for controllers. The system of the future may include several types of resectorization supported by automation tools. Limited dynamic resectorization is similar to what is done now but may see more widespread use. Unlimited dynamic resectorization represents a leap into the future with underlying technology that does not exist today. Both approaches raise human factors questions, which should be approached systematically in a proactive manner. The more flexible the system becomes the more dynamic the options will be. Operators will need solid anchors if they are going to be able to efficiently and expeditiously maintain safe separation between aircraft.

## Call for Submissions

By Todd R. Truitt

As your SJHFES Publications Chair, I am always looking for material to include in future editions of The Interface. The Interface is not just a way for the Executive Council to communicate information to members; it is also a means to share information among members and to promote our chapter and its members. Please consider submitting information for publication in The Interface. We will publish just about anything related to human factors such as book or article reviews, summaries of recent publications, or descriptions of bad human factors designs you have experienced. If you would like to submit materials for publication in The Interface, please send them to [todd.truitt@faa.gov](mailto:todd.truitt@faa.gov).



<http://www.sjhfes.org/>

## Highlights of Recent Executive Council Meetings

By Karen Peio

May 9, 2006, 12 pm

**Attendees:** Carolina Zingale, Bonnie Kudrick, Ferne Friedman-Berg, Kenneth Allendoerfer, Gulshan Panjwani, Todd Truitt, Anton Koros, Karen Peio

#### Program

May 10: Tour of the AFTIL. Expect approximately 12-13 people to attend.

June: perhaps June 14 - 21. Undecided. May decide to go with video or pair Bruce Rosenberg presentation with another presentation. Gulshan will check with Ulf Ahlstrom regarding a presentation. Bonnie will check the availability of the CVA in the main Tech Center Bldg.

July 11: Meeting will be JSSF Winners. The two winners will present their work.

August: Tanya and Bart will present their HFES submission. Carolina will confirm.

September: Annual Picnic - Continued discussion of a picnic at Cowtown Rodeo in Woodstown. Gulshan will check out group prices. The chapter will spend \$80.00 to reduce the cost of the tickets for chapter members.

October: Open. Continued discussion of a Community Outreach during National Ergonomics Month in October at Richard Stockton College, similar to what we did last year at Rowan.

#### Publication

The Interface is scheduled to go out early June. All input needs to be to Todd by June 5, 2006.

Carolina will include something about AFTIL tour.

Bonnie will write up summary of Frank Durso talk – from TC news.

Ken will write up a piece for the Interface discussing the Don Norman talk at University of Pennsylvania.

**Student Inventions Through Education (SITE)**

Carolina reported that the exhibits were "great". She recommends we support this event again.

**Membership**

Anton reported 27 renewals for FY06, including 2 lifetime members and 2 free members. One membership renewal was received in April of FY06.

**Nomination**

Ferne will send out nomination ballots in September. Voting is scheduled for November 2006.

**Treasurer**

Bonnie reported \$1223.21 total assets (\$805.37 checking, \$329.57 in savings and \$88.27 in Petty Cash). Expenditures included prizes for SITE and pizza for lunch meeting.

**Distinguished Chapter Award**

More discussion about the Puget Sound chapter win. They sponsored a science fair and had more outreach program during the past year.

**Next Meeting**

June 13 Executive Council lunch time meeting.

# Human Factors Job Listings

Sr. User Interface Designer/Manager  
Contact: Patty Lowery  
Sr. Technical Recruiter, Human Resources  
PHH Mortgage Corporation  
(856) 917-4717

Responsibilities:  
Develops design concepts and user interface designs to include analyzing

requirements, diagramming user profiles, developing UI paradigms, and offering highly usable interface solutions.

Effectively communicates and provides detailed wireframes to Operational and IT departments.

Keeps up to date on best practices in customer experience, usability and ecommerce.

Defines the customer experience including creative requirements, art direction/design, conceptual, production techniques, copywriting, and a good understanding of overall creative and interaction processes.

Conduct usability tests to evaluate effectiveness of designs.

Work with Web Analytics to measure and optimize.

**Skills and requirements:**

Knowledge of current usability research, theories and methodologies, and an intuitive feel for how human factors activities provide unique value throughout the development lifecycle.

Deep knowledge of user interface design principles, information design, and web design.

Knowledge of and hands-on experience with user interface evaluation techniques, including usability testing.

Familiarity with usability-related research services, periodicals, thought leaders and industry best practices

Experience in developing the user interface and improving usability on ecommerce websites.

Experience creating and modifying web layouts, web graphics, and online marketing creative.

Basic HTML & CSS skills (knowledge of JavaScript, XHTML and RSS a plus).

Proficient using design and development software including Photoshop.

Thorough knowledge of visual design principals: graphic design, layout, typography, icon development, corporate identity and branding.

Knowledge of web browsers and their limitations.

Experience with optimization of web based graphics and animations .

Solid understanding of CSS and cross platform issues.

Self motivated learner, ability to problem solve software and technical issues and tap appropriate resources when needed.

Good time management skills, able to prioritize tasks based on impact and communicate issues/resolutions to supervisor.

Strong communication skills.

Bachelor's degree highly preferred.

Interested candidates please visit our website at: [www.phhjobs.com](http://www.phhjobs.com). Position is a full time direct position working at our headquarters in Mount Laurel, New Jersey 08054.



Department of Transportation  
Federal Aviation Administration  
External Vacancy Announcement  
Vacancy Announcement Number: ACT-ATO-06-AJP7132-86559

**Open Date:** May 26, 2006

**Close Date:** Jun 16, 2006

**Position:** Engineering Research Psychologist, FG-0180-12 / 13

**Duty Location(s):** Atlantic City, New Jersey

**Organization Location:** FAA Technical Center Region, FAA Technical Center Region, Air Traffic Organization, Office of Integrated Engineering Services, Systems Engineering & Safety Division, ATO-P

**Duties:** This position is in the Human Factors Group/Team located at the William J. Hughes Technical Center assigned to the Human Factors Research and Engineering Division/Group. The incumbent will be a professional psychologist responsible for planning, implementing, and coordinating work in human factors engineering design, development, and/or evaluation of air traffic control (ATC) and Technical Operations (TO) systems. The incumbent will serve as a member of multidisciplinary teams. This position has

promotion potential to the FG-13 without further competition.

For more information, go to <http://jobs.faa.gov/>.

## **2006 Executive Council**

### **President**

Carolina Zingale

### **President-Elect**

Kenneth Allendoerfer

### **Secretary**

Karen Peio

### **Treasurer**

Bonnie Kudrick

### **Nominations & Elections Chair**

Ferne Friedman-Berg

### **Publications Chair**

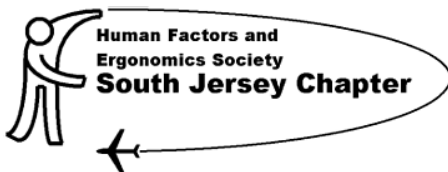
Todd R. Truitt

### **Program Chair**

Gulshan Panjwani

### **Membership Chair**

Anton Koros



<http://www.sjhfes.org/>

# South Jersey HFES Chapter Membership and Renewal Application

**For the Year 2006**

Applicant Name: \_\_\_\_\_

New Member (*complete all fields*)

Renewal (*complete this section only*)

I am (a Fellow / a Full Member / an Associate Member / Not a Member) of the National HFES (*circle one*)

Organization/Company: \_\_\_\_\_

Mailing address: \_\_\_\_\_  
\_\_\_\_\_

Daytime phone: (    )    -

Evening phone: (    )    -

Fax number:        (    )    -

E-mail address: \_\_\_\_\_

Endorsing SJC-HFES Member: \_\_\_\_\_

SJC HFES dues for 2006 are \$10. Make checks payable to the "Human Factors Society." Submit applications and checks to:

Anton Koros  
RDHFL Bldg 28  
Wm. J. Hughes Technical Center  
Atlantic City Int'l Airport, NJ 08405