MESSAGE FROM THE CHAIR

Welcome to our Winter 2017 issue!

By Jennifer Ockerman, Ph.D.
CEDM Technical Group Chair

Thank you to everyone who participated in the 2016 HFES Annual Meeting in Washington, D.C., all of the organizers, reviewers, presenters, and session chairs and co-chairs. We can’t have a CEDM program without you! As Mark Pfaff reported at the business meeting we had 8 technical sessions (40 lectures, 4 panels, and 1 symposium), with 2 additional co-sponsored sessions as well as 7 posters. Mark and Stephen Gilbert did a wonderful job as Program Chair and Chair-Elect this year with another high quality program. Please thank them if you get a chance.

Several announcements were made at the business meeting and are repeated here for those who missed them:

- The NAE committee on researching the science of team science has an annual conference to bring in team researchers for scientific study next June 12-15, in Clearwater Beach, FL.
- The bi-annual 13th International Conference on Naturalistic Decision Making will be in Bath UK. Call for papers is up on web site.
- And a few position openings that you can find later in this newsletter.

After this past annual meeting we switched to a new Newsletter Editor and Student Awards & Affairs Officer. Our new Newsletter Editor is Priya Pennathur, a professor at the University of Iowa and our new Student Awards & Affairs Officer is Kylie Molinaro, a doctoral candidate from the University at Buffalo. (You can find a list of all the current CEDM TG officers later in this newsletter and on the CEDM TG website.)

A big THANK YOU to our outgoing officers, Zarrin Chua (Newsletter Editor) and Ziho Kang (Student Awards & Affairs Officer). They have both provided multiple years of high quality service to the CEDM TG, which we greatly appreciate.

Now looking to the future. If you attended the HFES President’s address at this past meeting you heard about the push to align our research with the National Academies of Engineering (NAE) Grand Challenges to facilitate interdisciplinary research and show the applicability of human factors to today’s technical challenges. If not, or you want to learn more, you can also see articles about this topic in the September HFES Bulletin (The Role of Human Factors and Ergonomics in the NAE Grand Challenges) and in the January HFES Bulletin (Let’s Resolve to Take on the Grand Challenges)! Some specific activities are being planned for the 2017 annual meeting and they are encouraging program submissions that address and speak to the NAE Grand Challenges but we would love to have all your CEDM-related submissions for consideration for the 2017 Annual Meeting. Remember that the deadline is March 13.
Please let me, or any of the other officers know if you have any concerns during the year. I hope to see many CEDM TG members at the next conference in Austin, TX in October.

Jennifer※

CEDM ON LINKEDIN & FACEBOOK

By Dev Minotra, Ph.D.
CEDM TG Electronic Communications Director

The LinkedIn group of the CEDM Technical Group has a total of 2637 members. This number has not changed much over the last 4 to 8 months. Members are encouraged to invite more colleagues into the LinkedIn group. Members are encouraged to post discussion topics, news related to CEDM, announcements for job opportunities or to elicit participation in surveys. We would especially like to receive news updates about solutions being developed for challenging problems related to human-automation interaction, partially automated vehicles, aviation, cyber security, situation awareness, work analysis, teamwork, display design and other areas within CEDM. TG executives will occasionally request individual members to contribute to the discussion forum or they may also share/re-direct content posted in social media by colleagues. To ensure proper usage of the media, TG executives regularly monitor posts and requests to join. They also invite colleagues into the LinkedIn group.

Current trending topics on LinkedIn include:

- The Power of Chunking

The TG also maintains a Facebook page (www.facebook.com/groups/7636301315/) which currently has 267 members which is about a 5% increase since Winter 2016. Additionally, the CEDM TG website (tg.hfes.org/cedm/) provides regular news updates, job announcements, and access to the newsletter archive. Old announcements and job postings are usually removed from the website.

As a reminder, the CEDM-TG listserv is for TG-related announcements only. Discussions should be carried out on LinkedIn or Facebook pages. TG members who are not LinkedIn users but are interested to join can visit - www.linkedin.com/reg/join. Please note that the CEDM-TG does not control enrollment on the listserv and can neither add nor remove recipients. All members of the CEDM-TG are automatically added to the TG mailing list. Those wishing to leave the list must contact HFES Member Services (info@hfes.org).

ANNOUNCEMENTS

CEDM Technical Group Student Paper Competition Winners

Congratulations to our student paper winners!

FIRST PLACE: Katelynn A. Kapalo
University of Central Florida
The Application and Extension of the Human-Animal Team Model to Better Understand Human-Robot Interaction: Recommendations for Further Research
Co-authors: Elizabeth Phillips, Stephen M. Fiore

SECOND PLACE: James Walliser, Maj
George Mason University
System-Wide Trust in Multiple Autonomous Agents

THIRD PLACE: Samantha F. Warta
University of Central Florida
Similarity, Complementarity, and Agency in HRI: Theoretical Issues in Shifting the Perception of Robots from Tools to Teammates
Co-authors: Kapalo, K.A, Best, A., Fiore, S.M.

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New Publication: Intuitive Cognition and Models of Human-Automation Interaction

Robert Earl Patterson presents a new dual-processing taxonomy in his upcoming paper (February) in Human Factors. In his paper, Patterson discusses advantages of intuitive cognition over analytical cognition, and present implications for smart systems of the future. For more details, see https://www.hfes.org/web/DetailNews.aspx?Id=431

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HFES elects distinguished members to Fellow

During the 2016 Annual Meeting held in Washington, DC, following members were recognized and honored for their outstanding contributions to the profession. Members in our CEDM group (in bold italics) were also recipients of the honor. Congratulations to all the fellows!

Thomas J. Albin, High Plains Engineering, Minneapolis, Minnesota
James P. Bliss, Professor of Psychology, Old Dominion University, Norfolk, Virginia
Jack T. Dennerlein, Professor, Department of Physical Therapy, Movement, and Rehabilitation Science, Northeastern University, Boston, Massachusetts
Karen Jacobs, Clinical Professor of Occupational Therapy, Boston University
Nancy L.J. Larson, Principal, Nancy L.J. Larson Consulting, Minneapolis, Minnesota
Christopher B. Mayhorn, Professor of Psychology, North Carolina State University, Raleigh, North Carolina,
William H. Muto, Principal, WHM Consulting, Richardson, Texas
Jay G. Pollack, Principal, Jay Pollack Consulting, Hillsboro, Ohio
Amy R. Pritchett, Assistant Professor, School of Aerospace Engineering, Georgia Institute of Technology, Atlanta, Georgia
Harvey S. Smallman, Senior Scientist, Pacific Science and Engineering, San Diego, California
Tonya L. Smith-Jackson, Professor and Chair, Department of Industrial and Systems Engineering, North Carolina A&T State University, Greensboro, North Carolina
Kim-Phuong L. Vu, Assistant Professor, Department of Psychology, California State University, Long Beach

Cognitia Readership Survey Results

By Priya Pennathur, PhD
CEDM Newsletter Editor

We asked our readers to complete a survey on whether they find Cognitia useful and ways we could improve it. 11 people responded to the survey and provided useful feedback. Majority of the respondents were from Industry. Readership is heavily US/Canada based. Here is a summary of results:

(1) 73% of respondents read the newsletter regularly
(2) Most readers are interested in feature articles, HFES/Cognitive Engineering related announcements, and would like to be updated on state of affairs in the CEDM technical group
(3) For future improvements, readers would like to see more of “Industry Profiles”, a feature introduced by Zarrin Chua in 2015
(4) Readers are open to change in format of Cognitia – from text based to digital friendly.

I will be sending out a survey in summer to solicit your feedback on new ideas we would like to include in the newsletter. Meanwhile, feel free to email me any feedback and thoughts on the newsletter.

BOOK REVIEW

Author: Ron W. McLeod.

Review by Barry Kirwan, EUROCONTROL

Often when people from industry ask me what they should read on Human Factors, I pause, because there are actually few books on the subject that aren’t written by academics for academics. Now, thankfully, there is such a book. It has a solid industry feel to it, and the questions it poses and answers remind me of many discussions I’ve had over the years in numerous industries, but particularly Oil and Gas where the dollar is what really counts. The
tone is informative and clear, sometimes conversational, but that is useful where we are trying to convince people that Human Factors has something to offer, and doesn’t have to be esoteric. But most of all, the book is peppered with convincing figures and photos from case studies where Human Factors has made a difference.

The book is divided into five sections, though it does not have to be read in a particular order. After a short introduction, which deserves reading because it sets out why Ron wrote the book and how he hopes it will help industry, he tackles ‘local rationality’ (why an operator may have made a mistake because it seemed like a good idea at the time). This is a neat approach, because it borrows from gurus such as Professor James Reason, and then uses the ideas to open up a whole range of human performance issues such as procedure/rule violation and risk-taking, which can sometimes seem ‘taboo’ subjects in Human Factors books, but are actually valid concerns in industry. Then Ron explains how and why they happen, and how to fix them via changing the system in cost-efficient ways, rather than blaming the operator (which rarely solves anything). The Formosa accident is used as a case study in this section, an advantage being that there are very useful referenced resources outside the book (e.g. free video material on the accident) which can be used to spread the word wider inside an organisation.

Part Two delves into the scope and value of Human Factors Engineering, asking tough questions such as how much does it cost, and what kind of return on investment are we looking at? He covers ‘hard truths’ about human performance, and the all-too-familiar ‘ironies of automation’, lessons we seem unable to learn or resolve even in industries where technology is king, such as aviation.

Part Three goes deeper into the ‘problem with people’, and cites the recent Kahneman ‘System 1 and System 2 thinking’ concepts as ways of explaining how people act in normal life, and how this can translate into problems in industrial settings, including common biases that unfortunately tend to be hard-wired into the way we think. By this stage of the book there is also a strong emphasis not only on fixing what goes wrong, but trying to reinforce what goes right (so-called ‘Safety 2’ thinking).

Part Four unpacks the mysteries behind barrier thinking and modelling, including ‘bow-ties’. This is where Human Factors meets safety engineering, the result being more robust human and system performance. Ron keeps it simple, avoiding getting bogged down in methodology, so the reader can ‘see the wood for the trees’. The Buncefield accident is used as a case study in this section of the book, and Ron shows how its lessons reach back into the design stages of alarm systems, highlighting the importance of understanding ‘design intent’ at this stage, so that when operators detect alarms during operational phase, the alarm system is fit for purpose, and the original design intent translates into a safe outcome.

The final part of the book concerns how to implement Human Factors, and it does so in the context of Oil and Gas and Process industries, including the nature of Capital Expenditure Projects and their lifecycles, including the all-important design and development phases. Ron addresses tricky questions such as where to locate Human Factors within organisations, and rather than giving abstract answers, poses questions that will make sense to managers and directors: who wants it most, who stands to gain most from it, who will suffer most if it goes wrong? As with the rest of the book, his language and tone ‘speaks’ to people in industry who are used to having to make hard choices under time pressure.

While this book is most valuable to industry managers, engineers and designers, and other professionals trying to understand and optimise human performance in industrial settings, I believe many academic Human Factors professionals would gain a lot from Ron’s insights.

In summary, this landmark book successfully de-mystifies Human Factors for the Oil and Gas and Process industries, enabling those industries to harness its expertise to increase human performance, safety, and system productivity. If you are a manager, engineer, or designer facing human performance issues and wondering what to do about them, read this book.
RESEARCH NEWS

The Landry Lab
By Audrey Reinert

The Purdue University Landry Lab focuses on applying human factors first principles to cross-cutting research in the domains of aviation and medicine. Previous research projects undertaken by the graduate and undergraduate students affiliated with the lab include: the development of hybrid modeling methods to detect flight deck human-automation issues, architecture studies for future safe, high-capacity air transportation systems, and analyzing Jawbone UP wristband data from the Hawaii Space Exploration Analog and Simulation (HI-SEAS) 8-month and 12-month missions. In addition to funding from NASA and the FAA, the Landry Lab receives funding from the Regenstrief Institute to study alarm fatigue when using infusion pumps.

Cognitive Engineering Center, Georgia Institute of Technology, Atlanta, GA

Faculty members: Prof. Karen Feigh and Prof. Amy Pritchett

The Cognitive Engineering Center (CEC) examines human-system integration in complex work environments from theoretical and methodological viewpoints. Consisting of two tenured professors, ten doctoral students, three master's students, and a postdoctoral fellow, the CEC team has made substantive contributions to human factors practice. Currently, the CEC is working on several projects that have applications in aviation, military decision-making, human-robot interaction, human spaceflight operations and computer-assisted driving. The projects examine wide-ranging human factors issues and designs including intelligent guidance for assisting pilots in landing helicopters, decision support systems to help astronauts during extravehicular activities, new sensor technologies (such as LIDAR and MWR) for facilitating vision systems in cockpits, pilot interactions with current and future collision avoidance systems, decision aids in aircraft cockpits to aid decision making under uncertainty, intent prediction from operator physiology and behavior during robotic tele-operation, and decision support systems for navy warfighters in degraded information environments. Furthermore, the CEC has developed a simulation framework, Work Models that Compute, which is being leveraged to examine a function allocation design space within human-robot teaming for future space exploration missions. Differences in function allocation effectiveness are also being studied in the context of NextGen air-traffic management, through computational simulations. A human-automation teaming project is exploring teaming issues in aviation particularly in meteorology, unmanned vehicles, air-traffic management, flight decks among other areas. The CEC also explores human-robot interaction. One project is leveraging techniques and models from human factors, computational neuroscience, and optimal control theory to explore learning and adaptation in autonomous vehicles. Another is developing protocols and interactive machine learning algorithms to improve ways in which humans can teach robots with natural and intuitive methods. From teaching robots to assisting pilots, the CEC is constantly advancing safer and more efficient, flexible, and adaptive human-system integration for the future.

CALL FOR PROPOSALS & PAPERS

HFES 2017 International Annual Meeting, Austin, Texas, October 9 - 13

HFES 2017 call for proposals is now available. Please see this link for detailed instructions on proposal submission. The deadline is March 13, 2017, 6PM EST. Decision letters will be sent the week of April 24th, and final papers are due June 12th. HFES is especially seeking proposals addressing National Academy of Engineering's Grand Challenges.

https://www.hfes.org//Web/HFESMeetings/2017AMcallforproposals.html

International Conference on Cognitive Modeling (ICCM) 2017, July 22 – 25, University of Warwick, UK.

ICCM Registration is now open. The submission deadline is March 15th, and decisions will be made by May 1. For more details, please see:

http://mathpsych.org/conferences/2017/
EMPLOYMENT OPPORTUNITIES

Tenure-Track Position
University of Waterloo
Department of Systems Design Engineering
Page 7

Tenure Track Positions
UMBC
The Information Systems Department
Page 8

Research Leader – Human Systems
Defence Technology Agency at Devonport Naval Base
Page 9

Post Doctoral Fellow
Loma Linda University Health
Page 10

Cognitia Volume 23, No. 1, Winter 2017

Newsletter of the Cognitive Engineering and Decision Making Technical Group

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For previous editions of this newsletter, please visit http://tg.hfes.org/cedm/newsletter.htm

Questions? Comments? Suggestions? Submissions?
Please contact us at http://tinyurl.com/CognitiaTalk2us
We are hiring at the University of Waterloo, in Human Factors Engineering!

The University of Waterloo is the number one engineering school in Canada as ranked by US News and World Report. Canada has a vibrant research funding landscape and the University of Waterloo attracts the top students in Canada and internationally. We have a strong collaborative human factors group with many cross collaborations across the university. Diversity is welcome. The ad should be read as a suggestion of areas of interest, but we are open to other suggestions. We are looking for great smart people to join our team and collaborate with us. For informal questions about the position, please contact me, Catherine Burns at catherine.burns@uwaterloo.ca


The Department of Systems Design Engineering at the University of Waterloo offers programs in Systems Design Engineering and Biomedical Engineering, and is a partner in the Mechatronics Engineering program. The programs are highly interdisciplinary, with an emphasis on analysis, design, and creativity. Applications are invited for a tenure-track faculty position in Systems Design Engineering at the rank of Assistant or Associate Professor.

Candidates must possess a PhD degree, preferably in engineering, and must be eligible for registration with the Professional Engineers of Ontario and commit to registering within three years. We are seeking a candidate in Human Factors Engineering, with a solid background in human factors approaches and methods including modeling, human performance measurement, experiment design, simulation and product design. Applications of interest include, but are not limited to, human interaction with automation, human-robot interaction, interaction with autonomous vehicles, neuroergonomics, and human factors in healthcare. The successful candidate will be expected to supervise graduate students, to develop a leading-edge research program, and to teach both undergraduate and graduate courses in human factors and engineering fundamentals.

Our departmental philosophy is to take an integrative and multidisciplinary approach to creative problem solving, modeling, and design; thus enthusiasm is encouraged for collaborative and interdisciplinary research within the Department, Faculty, University, and world-wide in both academic and industry sectors. We seek individuals who have developed or who have the capability to develop robust and sustained externally-funded research programs that complement existing strengths in the Department and Faculty. Please submit with the application a statement of teaching interests and goals, per the instructions at Systems Design Open Positions. Three letters of reference will be requested for applicants invited for an interview.

Applications should be forwarded to Ms. Vicky Lawrence, Department of Systems Design Engineering, University of Waterloo, Waterloo, Ontario, Canada, N2L 3G1, preferably by email to vlawrence@uwaterloo.ca. Applications will be received until a closing date of March 15, 2017. The salary range for this tenure-track position is $100,000 to $150,000, depending on experience. Negotiations beyond this salary range may be considered for exceptionally qualified candidates. The University of Waterloo respects, appreciates and encourages diversity. We welcome applications from all qualified individuals including women, members of visible minorities, Aboriginal peoples and persons with disabilities. All qualified candidates are encouraged to apply; however, Canadian citizens and permanent residents will be given priority. The appointment has a preferred starting date of May or September 2017.
The Information Systems (IS) Department at UMBC is committed to increasing the diversity of our community. We invite applications for two tenure-track faculty positions at the Assistant Professor level starting August 2017. We are searching for candidates with research interests and experience in Data Science, a research area with high growth and impact in environmental sciences, health care, security, applied statistics and others. The ideal candidate will have expertise in conducting large-scale data science research, such as extracting knowledge from data of increasing sizes, velocity, and variety to improve decision making in one or more application domains closely relevant to active research areas in the IS department. The research areas in the department are: Artificial Intelligence/Knowledge Management, Databases and Data Mining, Human Centered Computing, Software Engineering, and Health Information Technology. Candidates must have earned a PhD in Information Systems or a related field no later than August 2017.

The Department offers undergraduate degrees in Information Systems and Business Technology Administration. Graduate degree programs, MS and PhD, are offered in both Information Systems and Human-Centered Computing, including an innovative online MS program in IS. Consistent with the UMBC vision, the Department has excellent teaching facilities, state-of-the-art laboratories, and outstanding technical support. Further details on our research, academic programs, and faculty can be found at http://www.is.umbc.edu.

UMBC is a dynamic public research university integrating teaching, research and service. As an Honors University, the campus offers academically talented students a strong undergraduate liberal arts foundation that prepares them for graduate and professional study, entry into the workforce, and community service and leadership. UMBC emphasizes science, engineering, information technology, human services and public policy at the graduate level. UMBC contributes to the economic development of the State and the region through entrepreneurial initiatives, workforce training, K-16 partnerships, and technology commercialization in collaboration with public agencies and the corporate community. Diversity is a core value of the UMBC and we believe that the educational environment is enhanced when diverse groups of people with diverse ideas come together to learn. Therefore, members of underrepresented groups including women, minorities, veterans and individuals with disabilities are especially encouraged to apply.

UMBC continues to lead U.S. News national university rankings placing fourth in Most Innovative National University and sixth in Undergraduate Teaching. The Chronicle of Higher Education for the fifth consecutive year has listed UMBC in the “honor roll” of “Great Colleges to Work For”; it is the only Maryland four-year institution to be recognized. Our strategic location in the Baltimore-Washington corridor puts us close to many important federal laboratories, agencies and high-tech companies. UMBC’s campus is located on 500 acres just off I-95 between Baltimore and Washington DC, and less than 10 minutes from the BWI airport and Amtrak station. The campus includes a center for entrepreneurship, and the bwtech@UMBC research and technology park, which has special programs for startups focused on cybersecurity, clean energy, life sciences and training. We are surrounded by one of the greatest concentrations of commercial, cultural and scientific activity in the nation. Located at the head of the Chesapeake Bay, Baltimore has all the advantages of modern, urban living, including professional sports, major art galleries, theaters and a symphony orchestra. The city’s famous Inner Harbor area is an exciting center for entertainment and commerce. The nation’s capital, Washington, DC, is a great tourist attraction with its historical monuments and museums. Just ten minutes from downtown Baltimore and 30 from the D.C. Beltway, UMBC offers easy access to the region’s resources by car or public transportation.

Qualifications
Candidates should be engaged in research that fosters collaboration with at least one of the research areas. Preference will be given to those who can collaborate with current faculty within and across departments at UMBC, fostering interdisciplinary research. Candidates are expected to establish a collaborative, externally funded and nationally recognized research program as well as contribute to graduate and undergraduate teaching, advising, and mentoring that support diversity and inclusion.
Application Instructions
Electronic submission of application is required at http://apply.interfolio.com/37306. All applications must be submitted as PDF files, which include a cover letter, CV, a one-page statement of teaching interests, a one-page statement of research interests and names and contact information of at least three references. For inquiries, please contact Barbara Morris at (410) 455-3795 or bmorris@umbc.edu. Review of applications will begin in November 2016 and will continue until the positions are filled, subject to the availability of funds. https://apply.interfolio.com/37306

Do you have qualifications in the field of ergonomics, physiology, sport science, human systems engineering or similar, with demonstrated experience in applying your knowledge in a systems context?
• Are you an analytical thinker who can take a multi-disciplinary view of a complex problem and identify novel yet practical solutions?
• Do you have a proven background in managing research and development activity in an applied context?
• Do you have an aptitude and demonstrated experience in the mentoring and development of other professionals?

Do you have qualifications in the field of ergonomics, physiology, sport science, human systems engineering or similar; along with a passion for research and creative thinking? If this sounds like you, Defence Technology Agency at Devonport Naval Base would like you to apply for the position of Research Leader - Human Systems.

The Defence Technology Agency (DTA) is a business unit established to provide applied research, exploratory development, and policy studies on science, technology and related areas with application to military technology, force development and operations. The Human Systems Group within DTA has responsibility for providing research, science and technology support to the New Zealand Defence Force in the field of Human Performance.

To be successful in this role you will have:

• Demonstrated success in the application of Human Factors to technology development and the conduct of scientific research preferably in the Defence Sector. A strong understanding of Human Systems Integration processes is highly desirable

• Broad knowledge of Ergonomics/Human Engineering, Cognitive Science or Applied Psychology, Operability Testing and experimentation, Human Reliability

• Experience in managing R&D efforts for the organisation and contributing to overall business management or strategic planning

• Ability to deal with problems of considerable scope and complexity

• Computer literacy and ability to use specialised technical software and equipment

• A strong work ethic and a desire to enhance human performance across NZDF

• Strong communication skills and a proven ability to engage with customers/stakeholders, systems users and other professionals.

In return for your skills you will receive five weeks annual leave and a unique working environment. Apply now!
Post Doctoral Fellow

Loma Linda University Health

Job Summary: Reports to Principal Investigator. This position becomes part of a team that investigates the cognitive foundations of interprofessional teamwork, which includes the work of patients and their families. A sociotechnical systems framework and theories of distributed cognition, situation awareness, and naturalistic decision-making will guide this research, which is conducted both in the hospital and the Medical Simulation Center. As a productive member of the research team, the fellow will be involved in all stages of the research process from the initial design to the dissemination of results. Performs other duties as needed.

Job Specifications: Knows the basic principles of human factors engineering along with commonly used research methodologies, such as semi-structured interviewing and ethnographic field research. Must be able to use various software applications, such as spreadsheets, statistical packages, and qualitative data analysis programs including but not limited to NVivo. Able to keyboard 40 wpm. Able to read; write legibly; speak in English with professional quality; use computer, printer, and software programs necessary to the position (e.g., Word, Excel, Outlook, and PowerPoint). Operate/troubleshoot basic office equipment required for the position; Able to relate and communicate positively, effectively, and professionally with others; work calmly and respond courteously when under pressure; collaborate and accept direction. Able to communicate effectively on the telephone; think critically; manage multiple assignments effectively; organize and prioritize workload; work well under pressure; problem solve; recall information with accuracy; pay close attention to detail; work independently with minimal supervision and make independent decisions.

PhD in human factors engineering, cognitive psychology, industrial engineering, social science, or similar degree required. Minimum six months of experience in cognitive task analysis (CTA) and/or qualitative interviewing of research participants is highly preferred. The applicant should have interest in human factors and resilience.
engineering as applied to health care settings and must be willing to learn new technologies relevant to human factors research.