

Contents

Human-Autonomy Teaming

Why Human-Autonomy Teaming? 3
R. Jay Shively, Joel Lachter, Summer L. Brandt, Michael Matessa,
Vernol Battiste, and Walter W. Johnson

**A Human-Autonomy Teaming Approach
for a Flight-Following Task** 12
Summer L. Brandt, Joel Lachter, Ricky Russell, and Robert Jay Shively

Measuring the Effectiveness of Human Autonomy Teaming 23
Thomas Z. Strybel, Jillian Keeler, Natassia Mattoon, Armando Alvarez,
Vanui Barakezyan, Edward Barraza, James Park, Kim-Phuong L. Vu,
and Vernol Battiste

Beyond Point Design: General Pattern to Specific Implementations 34
Joel Lachter, Summer L. Brandt, Garrett Sadler, and R. Jay Shively

**Using a Crew Resource Management Framework to Develop
Human-Autonomy Teaming Measures** 46
Michael Matessa

**The Impact of Neurocognitive Temporal Training on Reaction Time
and Running Memory of U.S. Active Duty Personnel** 58
Cory R. Overby, Valerie Rice, Gary Boykin, Leah Enders,
and Jessica Villarreal

**Neurocognitive Temporal Training for Improved Military
Marksmanship: Grouping and Zeroing.** 68
Gary L. Boykin, Sr. and Valerie J. Rice

Audition and Workload

Neurofeedback for Personalized Adaptive Training 83
Jesse Mark, Neha Thomas, Amanda Kraft, William D. Casebeer,
Matthias Ziegler, and Hasan Ayaz

**SHELL Revisited: Cognitive Loading and Effects of Digitized Flight
Deck Automation** 95
Mark Miller and Sam Holley

**Workload Assessment and Human Error Identification During the
Task of Taking a Plain Abdominal Radiograph: A Case Study** 108
Cesar Alferez-Padron, Aide Aracely Maldonado-Macías,
Jorge García-Alcaraz, Liliana Avelar-Sosa,
and Arturo Realyvasquez-Vargas

Spatial Perception

The Study of Sound and Shape Effects on Design 123
Tyan-Yu Wu and Alan Lee

**Research and Analysis on the Influence Factors
of Spatial Perception Ability** 131
Minxia Liu, Chengtong Tang, Lin Gong, and Qing Xue

**Cognitive Modeling for Robotic Assembly/Maintenance
Task in Space Exploration** 143
Yanfei Liu, Zhiqiang Tian, Yuzhou Liu, Junsong Li, Feng Fu,
and Jing Bian

Vision and Memory

**Analysis of Relationship Between Impression of Video
and Memory Using fNIRS** 157
Suguru Azehara, Toru Nakata, and Toshikazu Kato

**Evaluate Fatigue of Blue Light Influence on General LCD,
Low Blue Light LCD and OLED Displays** 166
Yunhong Zhang, Yingbao Yang, Yilin Chen, Yong Yang, and Yu Chao

**Comparison of Visual Comfort and Fatigue Between Watching
Different Types of 3D TVs as Measured by Eye Tracking** 175
Yunhong Zhang, Haibo Yang, Yufeng Xu, and Lei Feng

**An Eye-Movement Tracking Study on Influence of Circularly
Polarized Light LCD and Linearly Polarized Light LCD on Visual
Perception Processing Ability for Long-Term Continuous Use** 187
Yunhong Zhang, Jinghong Ding, Haibo Yang, Fan Zhang, Haitao Wang,
and Yu Chao

Visual Pattern Complexity Determination for Enhanced Usability in Cognitive Testing	195
Kanaka Babshet, Catherine Honegger, Ashley Gritzman, and Vered Aharonson	
Effects of Background Music on Visual Lobe and Visual Search Performance	204
Lindong Yang and Ruifeng Yu	
The Sound of Violin: Quantifying and Evaluating the Impact on the Performer's and Near Audience's Ear	214
Pedro Salvadores Palacio and Mercedes de Barrios Carro	
Neuroergonomics Theory and Design	
EEG-Engagement Index and Auditory Alarm Misperception: An Inattentive Deafness Study in Actual Flight Condition	227
Frédéric Dehais, Raphaëlle N. Roy, Gautier Durantin, Thibault Gateau, and Daniel Callan	
Aerospace Neuropsychology: Exploring the Construct of Psychological and Cognitive Interaction in the 100 Most Fatal Civil Aviation Accidents Through Multidimensional Scaling	235
Andreas Nidos, Spyros Stavrakis Kontostavlos, Petros Roussos, and Kostas Mylonas	
Physiological Model to Classify Physical and Cognitive Workload During Gaming Activities	246
Néstor Arroyo-Gómez, José Laparra-Hernández, Andrés Soler-Valero, Enrique Medina, and Helios de Rosario	
Predicting Stimulus-Driven Attentional Selection Within Mobile Interfaces	255
Jeremiah D. Still, John Hicks, Ashley Cain, and Dorrit Billman	
Evaluating ANN Efficiency in Recognizing EEG and Eye-Tracking Evoked Potentials in Visual-Game-Events	262
Andreas Wulff-Jensen and Luis Emilio Bruni	
Fundamental Cognitive Workload Assessment: A Machine Learning Comparative Approach	275
Colin Elkin, Sai Nittala, and Vijay Devabhaktuni	
Relationship Between EEG and ECG Findings at Rest and During Brain Activity	285
Yuto Nakahata and Hiroshi Hagiwara	

Empathy in Design: A Historical and Cross-Disciplinary Perspective 295
Yumei Dong, Hua Dong, and Shu Yuan

A Trial of Intellectual Work Performance Estimation by Using Physiological Indices 305
Shutaro Kunimasa, Kyoich Seo, Hiroshi Shimoda, and Hirotake Ishii

General and Systemic Structural Activity Theory

The Model of the Factor of Significance of Goal-Directed Decision Making 319
Alexander Yemelyanov

Applying SSAT in Computer-Based Analysis and Investigation of Operator Errors 331
Alexander Yemelyanov and Alla Yemelyanov

Mediating Subjective Task Complexity in Job Design: A Critical Reflection of Historicity in Self-regulatory Activity 340
Mohammed-Aminu Sanda

The Emerging Cognitive Difficulties and Emotional-Motivational Challenges of Ghanaian Air Traffic Controllers: Implication for Improved Job Design 351
Mohammed-Aminu Sanda and Emmanuel Owusu-Asiedu

Studying Thinking in the Framework of SSAT 362
Gregory Bedny, Inna Bedny, and Waldemar Karwowski

Concept of the Computer-Based Task in Production and Non-production Environment 370
Gregory Bedny and Inna Bedny

Activity Approach in Management 379
Fred Voskoboynikov

Cognitive Computing and Internet of Things: Techniques and Applications

Personalized Instructions for Self-reflective Smart Objects 389
Jan Pascal Maas, Daniel Burmeister, and Andreas Schrader

The Human Nervous System as a Model for Function Allocation in Human-Automation Interaction. 401
Behice Durgun

**Citizen Science Involving Collections of Standardized
Community Data** 410
Werner Leyh, Maria Fava, Narumi Abe, Sandra Cavalcante,
Leandro Giatti, Carolina Monteiro de Carvalho, Homero Fonseca Filho,
and Clemens Jacobs

The Signs of Semiotic Engineering in the IoT Interaction Design 421
Marcia Ikezaki Ferrari, Silvia Amelia Bim, and Plinio Thomaz Aquino, Jr.

Thing to Service: Perspectives from a Network of Things 434
Sharon S. Chinoy

Designing a Cognitive Concierge Service for Hospitals 447
Hari Madduri and Neil Gomes

Author Index 457

Advances in Neuroergonomics and Cognitive
Engineering

Proceedings of the AHFE 2017 International
Conference on Neuroergonomics and Cognitive
Engineering, July 17–21, 2017, The Westin Bonaventure
Hotel, Los Angeles, California, USA

Baldwin, C. (Ed.)

2018, XV, 458 p. 133 illus., Softcover

ISBN: 978-3-319-60641-5