

Cognitive Task Analysis Defense Technical Information Center

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Handbook of Human Systems Integration - Harold R. Booher
2003-07-07

A groundbreaking look at how technology with a human touch is revolutionizing government and industry Human Systems Integration (HSI) is very attractive as a new integrating discipline designed to help move business and engineering cultures toward a more people-technology orientation. Over the past decade, the United States and foreign governments have developed a wide range of tools, techniques, and technologies aimed at integrating human factors into engineering systems in order to achieve important cost and performance benefits that otherwise would not have been accomplished. In order for this new discipline to be effective, however, a cultural change is needed that must start with organizational leadership. Handbook of Human Systems Integration outlines the principles and methods that can be used to help integrate people, technology, and organizations with a common objective toward designing, developing, and operating systems effectively and efficiently. Handbook of Human Systems Integration is broad in scope, covering both public and commercial processes as they interface with systems engineering processes. Emphasizing the importance of management and organization concepts as well as the technical uniqueness of HSI, Handbook of Human Systems Integration features: * More than ninety contributors, technical advisors, and reviewers from government, industry, and academia * Comprehensive coverage of the most recent HSI developments, particularly in presenting the cutting-edge tools, techniques, and methodologies utilized by each of the HSI domains * Chapters representing the governments and industries of the United Kingdom and Canada * Contributions from three services of the Department of Defense along with the Federal Aviation Administration and the National Academy of Sciences * Many chapters covering both military and nonmilitary applications * Concepts widely used by government contractors both in the United States and abroad This book will be of special interest to HSI practitioners, systems engineers, and managers, as well as government and industry decision-makers who must weigh the recommendations of all multidisciplines contributing to systems performance, safety, and costs in order to make sound systems acquisition decisions.

Task Analysis Schema Based on Cognitive Style and Supplantational Instructional Design with Application to an Air Force Training Course - Floyd B. Ausburn 1980

The primary goal of this study was to develop a schema for learning task analysis and the design of instruction in which the cognitive style of learners is a major contributing variable. By identifying the functions a task requires, it can be determined which cognitive styles are likely to be incompatible with the task. Instruction can then be designed which provides necessary assistance through supplantation, which is defined as either altering the task requirement to better suit the capabilities of the learner or performing the function for learners which they are unable to perform for themselves. A task analysis schema was produced which identified (a) classes or types of

learning tasks related to cognitive style, (b) specific cognitive styles related to each class of task, and (c) instructional techniques recommended for each class of task in order to deal with cognitive style problems. The schema was applied to the tasks specified in the objectives of an Air Force training course. The Weapons Mechanic Course was analyzed using the proposed schema to demonstrate that it was particularly workable and was also well founded theoretically. The schema was found to be relevant to many of the course objectives and to generate recommendations for effective instruction. (Author).

JSpOC Cognitive Task Analysis - 2009

This paper overviews a Cognitive Task Analysis (CTA) of the tasks accomplished by space operators in the Combat Operations Division of the Joint Space Operations Center (JSpOC). The methodology used to collect data will be presented. The work was performed in support of the Air Force Research Laboratory's (AFRL) Space Situation Awareness Fusion Intelligent Research Environment (SAFIRE) effort. SAFIRE is a multi-directorate program led by Air Force Research Laboratory (AFRL), Space Vehicles Directorate (AFRL/RV). It is designed to address research areas identified from completion of a rapid response effort for the JSpOC. The report is intended to be a resource for those developing capability in support of SAFIRE, the Joint Functional Component Command (JFCC) Space Integrated Prototype (JSIP) User-Defined Operating Picture (UDOP), and other related projects. The report is under distribution restriction; our purpose here is to expose its existence to a wider audience so that qualified individuals may access it. The report contains descriptions of the organization, its most salient products, tools, and cognitive tasks. Tasks reported are derived from the data collected and presented at multiple levels of abstraction. Recommendations for leveraging the findings of the report are presented. The report contains appendices that amplify the methodology provide background or context support, and includes references in support of cognitive task methodology. In a broad sense, the CTA is intended to be the foundation for relevant, usable capability in support of space warfighters. It presents, at an unclassified level, introductory material to familiarize inquirers with the work of the Combat Operations Division; this is embedded in a description of the broader context of the other divisions of the JSpOC.

Behavioral and Cognitive Task Analysis Integration For Assessing Individual and Team Work Activities - Teresa Brenner 1998

Traditionally, the same type of task analysis procedures has been used for all types of jobs. Recent changes in the workplace include the increased focus on the cognitive demands of tasks and the increased use of work teams to accomplish these tasks. Researchers have discussed the implications of these trends for task analysis procedures in organizations today. Cascio (1995) noted an organizational change away from task-based work to more of a process. Jobs are no longer defined by a limited number of tasks, requiring the

employee to accomplish a range of tasks that may change over time. As a higher proportion of jobs are focusing on troubleshooting activities, cognitive task analysis may be more appropriate for identifying strategies involved in effective performance.

Applying Cognitive Work Analysis to Time Critical Targeting Functionality - 2004

The ability to destroy fleeing targets in a time critical environment is a key capability for the successful completion of the Joint Forces Commander's operations. The Time Critical Targeting Functionality (TCTF) program combines the functionality of several tools aiding in the prosecution of significant threats of fleeting vulnerability. As with any system, active user involvement and Human Factors guidance are necessary to ensure a usable design. The TCTF program applies these principles through several techniques, including Applied Cognitive Work Analysis, GUI Working Groups, Heuristic Evaluations, as well as user surveys. The basis for all these analyses is determining the correct information to display to the user at the correct moment. This document illustrates these techniques, provides the results and recommendations from the evaluations, and presents lessons learned and example surveys.

Cognitive Systems Engineering in Military Aviation Environments - 2002

User Interface Design for Virtual Environments: Challenges and Advances - Khan, Badrul 2011-12-31

The design of various virtual environments should be based on the needs of a diverse population of users around the globe. Interface design should be user centric and should strive for making the user's interaction as simple, meaningful, and efficient as possible. *User Interface Design for Virtual Environments: Challenges and Advances* focuses on challenges that designers face in creating interfaces for users of various virtual environments. Chapters included in this book address various critical issues that have implications for user interface design from a number of different viewpoints. This book is written for professionals who want to improve their understanding of challenges associated with user interface design issues for globally-dispersed users in various virtual environments.

Orchestrating Human-Centered Design - Guy Boy 2012-10-05

The time has come to move into a more humanistic approach of technology and to understand where our world is moving to in the early twenty-first century. The design and development of our future products needs to be orchestrated, whether they be conceptual, technical or organizational. *Orchestrating Human-Centered Design* presents an Orchestra model that attempts to articulate technology, organizations and people. Human-centered design (HCD) should not be limited to local/short-term/linear engineering, but actively focus on global/long-term/non-linear design, and constantly identify emergent properties from the use of artifacts. *Orchestrating Human-Centered Design* results from incremental syntheses of courses the author has given at the Florida Institute of Technology in the HCD PhD program. It is focused on technological and philosophical concepts that high-level managers, technicians and all those interested in the design of artifacts should consider. Our growing software-intensive world imposes better knowledge on cognitive engineering, life-critical systems, complexity analysis, organizational design and management, modeling and simulation, and advanced interaction media, and this well-constructed and informative book provides a road map for this.

FY86 Independent Research/Independent Exploratory Development - 1987

This report provides summaries of FY86 Independent

Research (IR) and Independent Exploratory Development (IED) efforts and the IR/IED funding profile, and presentations and publications based on IR/IED efforts. The following IR efforts are described: models for calibrating multiple-choice items, enhancing approaches to multiple objective assignment, performance on computer-based cognitive task, knowledge and process in adult language competence, analysis of cognition in natural settings, and brain mechanisms for human color vision. The following IED efforts are described: development of graphic design aids, trend analysis for real-time stochastic problems, and changes in cognitive structures training.

A Review and Annotated Bibliography of the Literature Pertaining to Team and Small Group Performance (1989 to 1999) - Andrew S. LaJoie 1999

"The military, along with private industry, is relying more on small teams of specialized individuals who work together to achieve a common goal. Examples of these teams include emergency medical teams, aircrews, decision-making teams, industrial project teams, Special Forces teams, weapon system crews and everyday work teams. Training and military doctrine has been evolving to reflect this emphasis on teamwork. The purpose of this annotated bibliography is to review literature published over the last ten years concerning team and small group performance. Specifically, the articles reviewed in this report represent a sampling of the research published in the social sciences, including psychology, sociology, and business. The team and small group literature reviewed includes examples of the many types of teams mentioned earlier. A summary and integration of this work is provided. In general, the research suggests that there are several components which contribute to the successful performance of teams, and that some of these components can be explicitly trained. Several training models are discussed." -- Stinet.

Review of Existing F-16 Task Analysis - A. S. Gibbons 1981

A task analysis is a very critical and fundamental component of an ISD project since it ultimately determines what tasks and contents will be included in the training program. The existing task analysis for the F-16 pilot compiled by General Dynamics was analyzed in terms of the specific requirements of the F-16 training program. The level of detail and scope of this existing task analysis were found to be adequate. The coverage of job tasks was found to be inadequate and in need of revision. The mission orientation of the existing analysis was considered to be weak in the areas of tactics, premission planning, and air-to-surface combat. The logical consistency of the analysis was found to be weak and in need for revision in the areas of air maneuvers and system operations. It was concluded that the existing F-16 task analysis would be helpful as a suggestive tool, but additional analysis is required to provide a solid foundation for the F-16 ISD effort. Areas particularly needing attention are those behaviors associated with cognitive performance (e.g., air-to-air or air-to-surface combat, mission planning, navigation, etc.) as opposed to equipment operation.

Cognitive Decrement - Joseph I. Peters 1985

The objective of this study was to review and select a taxonomy appropriate for the classification of Army helicopter crews tasks. The utility of such a taxonomy is that it provides a means for predicting performance of personnel on tasks which are similar to those already measured. This ability to generalize across tasks can save time and money in the process of predicting performance in a variety of jobs across numerous weapon systems. The study began with helicopter mission analysis followed by the identification of mission segments characterized by high operator workload. From these segments, tasks were defined and then classified.

Keywords: Task analysis, Radiation effects, task taxonomy, Mission analysis, Helicopter tasks, Human performance.

Accelerated Expertise - Robert R. Hoffman 2013-08-15
Speed in acquiring the knowledge and skills to perform tasks is crucial. Yet, it still ordinarily takes many years to achieve high proficiency in countless jobs and professions, in government, business, industry, and throughout the private sector. There would be great advantages if regimens of training could be established that could accelerate the achievement of high levels of proficiency. This book discusses the construct of 'accelerated learning.' It includes a review of the research literature on learning acquisition and retention, focus on establishing what works, and why. This includes several demonstrations of accelerated learning, with specific ideas, plans and roadmaps for doing so. The impetus for the book was a tasking from the Defense Science and Technology Advisory Group, which is the top level Science and Technology policy-making panel in the Department of Defense. However, the book uses both military and non-military exemplar case studies. It is likely that methods for acceleration will leverage technologies and capabilities including virtual training, cross-training, training across strategic and tactical levels, and training for resilience and adaptivity. This volume provides a wealth of information and guidance for those interested in the concept or phenomenon of "accelerating learning"— in education, training, psychology, academia in general, government, military, or industry.

Handbook of Multisensor Data Fusion - Martin Liggins II 2017-01-06

In the years since the bestselling first edition, fusion research and applications have adapted to service-oriented architectures and pushed the boundaries of situational modeling in human behavior, expanding into fields such as chemical and biological sensing, crisis management, and intelligent buildings. *Handbook of Multisensor Data Fusion: Theory and Practice, Second Edition* represents the most current concepts and theory as information fusion expands into the realm of network-centric architectures. It reflects new developments in distributed and detection fusion, situation and impact awareness in complex applications, and human cognitive concepts. With contributions from the world's leading fusion experts, this second edition expands to 31 chapters covering the fundamental theory and cutting-edge developments that are driving this field. New to the Second Edition— · Applications in electromagnetic systems and chemical and biological sensors · Army command and combat identification techniques · Techniques for automated reasoning · Advances in Kalman filtering · Fusion in a network centric environment · Service-oriented architecture concepts · Intelligent agents for improved decision making · Commercial off-the-shelf (COTS) software tools From basic information to state-of-the-art theories, this second edition continues to be a unique, comprehensive, and up-to-date resource for data fusion systems designers.

□□□□ - □□□ 1967

Independent Research and Independent Exploratory Development Programs: FY 88 Annual Report - William E. Montague 1989

Partial Contents: Stabilization of performance on a computer-based simulation of a complex cognitive task; Analysis of tutoring in technical training in the classroom laboratory and on-the-job; Brain wave correlates of memory performance; Brain mechanisms for human color vision -- Implications for display systems; Experienced-based career development; How to elicit knowledge from experts; Reading comprehension strategies; Optimal control theory for a system of quasi-linear difference equations; Loss forecasting with

empirical Bayes estimators; Models for calibrating multiple-choice items; Group size and member approval of reward plans in a gain sharing system -- Effects on individual performance. Keywords: Naval personnel research; Naval training; Psychological test construction; Group dynamics. (edc).

Task Analysis of the UH-60 Mission and Decision Rules for Developing a UH-60 Workload Prediction Model. Volume 3. Function Decision Rules Appendixes F and G. - 1988

A composite scenario was used to conduct a comprehensive task analysis of the mission of the UH-60 helicopter. The analysis used a top-down approach to identify the phases, functions, and tasks for the mission. Nine phases, 34 segments, 48 functions, and 138 tasks were identified. The crewmember performing each task was identified, and estimates of the sensory, cognitive, and psychomotor workload associated with tasks were derived. Estimates of the task times were also derived. The mission/task analysis data were used to develop a computer model of UH-60 crewmember workload. The model used a bottom-up approach to build mission functions from tasks, and mission segments from functions. Decision rules were written to specify the procedures for combining the tasks into functions, and the functions into segments. The model permitted an analysis of total workload experienced by each crewmember in the performance of both sequential and concurrent tasks, as well. Keywords: Man-machine interface.

Cognitive Task Analysis (l'Analyse Des Taches Cognitives). - 2000

Cognitive task analysis is defined as the extension of traditional task analysis techniques to yield information about the knowledge, thought processes and goal structures that underlie observable task performance. Cognitive task analyses are conducted for a wide variety of purposes, including the design of computer systems to support human work, the development of training, and the development of tests to certify competence. As part of its Programme of Work, NATO Research Study Group 27 on Cognitive Task Analysis has undertaken the task of reviewing existing cognitive task analysis techniques. The Group concludes that few integrated methods exist, that little attention is being paid to the conditions under which methods are appropriate, and that often it is unclear how the products of cognitive task analysis should be used. RSG. 27 has also organized a workshop with experts in the field of cognitive task analysis. The most important issues that were discussed during the workshop were: (1) the use of CTA in the design of new systems, (2) the question when to use what technique, and (3) the role of CTA in system design. RSG. 27 emphasizes: (1) that is important for the CTA community to be able to empirically demonstrate the added value of a CTA; (2) it is critical for the success of CTA to be involved in the design process from the start to finish, and to establish clear links with methods that are used by other disciplines, and (3) recommends that more research effort be directed to the issue of the reliability of CTA techniques.

Marriage Certificate, Henry Woodman and Mary Smith 12-9 Mo. - 1827 -

Automating a Detailed Cognitive Task Analysis for Structuring Curriculum - 1992

Expertise Out of Context - Robert R. Hoffman 2012-09-10
Researchers have revealed that real expertise, while applied to well-defined tasks with highly circumscribed contexts, often stretches beyond its routine boundaries. For example, a medical doctor may be called upon to diagnose a rare disease or perform emergency surgery outside his or her area of specialization because other experts are not available. Moreover, in some cases, the context for expertise is in a constant state of flux,

such that no one case is identical. Expertise Out of Context is a culmination of some of the most insightful studies conducted by researchers in the fields of cognitive systems engineering and naturalistic decision making in the effort to better understand expertise and its development. Born out of the Sixth International Conference on Naturalistic Decision Making, a conference that gathers researchers who study cognition, perception, and reasoning outside of the traditional laboratory, this book is organized in five parts, the first of which provides an overview of the topic and presents varied perspectives. Consequent sections cover how to make sense of things, tools for thinking out of context, how to cope with uncertainty in a changing workplace, and teams operating out of context. As researchers in naturalistic decision making have investigated such areas as the knowledge and decision-making skills of expert firefighters, critical care nurses, military commanders, and aircraft pilots, this volume is of importance to an expansive audience, including individuals in business, government, industry, and society at large.

Assisting People to Become Independent Learners in the Analysis of Intelligence - 2006

The purpose of this project was to conduct applied research with exemplary technology to support post-graduate instruction in intelligence analysis. The first phase of research used Cognitive Task Analysis (CTA) to understand the nature of subject matter expertise for this domain, as well as leverage points for technology support. Results from the CTA and advice from intelligence analysis instructors at the Naval Postgraduate School lead us to focus on the development of a collaborative computer tool (CACHE) to support a method called the Analysis of Competing Hypotheses (ACH). We first evaluated a non-collaborative version of an ACH tool in an NPS intelligence classroom setting, followed by an evaluation of the collaborative tool, CACHE at NPS. These evaluations, along with similar studies conducted in coordination with NIST and MITRE, suggested that ACH and CACHE can support intelligence activities and mitigate confirmation bias. However, collaborative analysis has a number of trade-offs: it incurs overhead costs, and can mitigate or exacerbate confirmation bias, depending on the mixture of predisposing biases of collaborators.

Research Product - U.S. Army Research Institute for the Behavioral and Social Sciences - 1999

Cognitive Task Analysis - Jan Maarten Schraagen 2000-06
Cognitive task analysis is a broad area consisting of tools and techniques for describing the knowledge and strategies required for task performance. Cognitive task analysis has implications for the development of expert systems, training and instructional design, expert decision making and policymaking. It has been applied in a wide range of settings, with different purposes, for instance: specifying user requirements in system design or specifying training requirements in training needs analysis. The topics to be covered by this work include: general approaches to cognitive task analysis, system design, instruction, and cognitive task analysis for teams. The work settings to which the tools and techniques described in this work have been applied include: 911 dispatching, faultfinding on board naval ships, design aircraft, and various support systems. The editors' goal in this book is to present in a single source a comprehensive, in-depth introduction to the field of cognitive task analysis. They have attempted to include as many examples as possible in the book, making it highly suitable for those wishing to undertake a cognitive task analysis themselves. The book also contains a historical introduction to the field and an annotated bibliography, making it an excellent guide to additional resources.

Applied Concept Mapping - Brian Moon 2016-04-19

The expanding application of Concept Mapping includes its role in knowledge elicitation, institutional memory preservation, and ideation. With the advent of the CmapTools knowledge modeling software kit, Concept Mapping is being applied with increased frequency and success to address a variety of problems in the workplace. Supported by business application case studies, *Applied Concept Mapping: Capturing, Analyzing, and Organizing Knowledge* offers an accessible introduction to the theory, methods, and application of Concept Mapping in business and government. The case studies illustrate applications across a range of industries—including engineering, product development, defense, and healthcare. The authors provide access to a free download of CmapTools, courtesy of the Institute for Human and Machine Cognition, to enable readers to create and share their own Concept Maps. Offering examples from the United States, Canada, Australia, Spain, Brazil, Scotland, and The Netherlands, they highlight a global perspective of this dynamic tool. The text is organized into three sections: Practitioners' Views—supplies narratives, guidance, and reviews of applications from career Concept Mappers Recent Case Studies and Results—presents in-depth examinations of specific applications and their results Pushing the Boundaries—explores what's possible and where the boundary conditions lie Applied Concept Mapping facilitates the fundamental understanding needed to harness the power of Concept Mapping to develop viable solutions to a virtually unlimited number of real-world problems.

Neurotechnology in National Security and Defense - James Giordano 2014-09-25

Neurotechnology in National Security and Defense: Practical Considerations, Neuroethical Concerns is the second volume in the *Advances in Neurotechnology* series. It specifically addresses the neuroethical, legal, and social issues arising from the use of neurotechnology in national security and defense agendas and applications. Of particular concern are the use of various neurotechnologies in military and intelligence operations training, acquisition of neurobiological and cognitive data for intelligence and security, military medical operations, warfighter performance augmentation, and weaponization of neuroscience and neurotechnology. The contributors discuss the neuroethical questions and problems that these applications generate as well as potential solutions that may be required and developed. The book examines how developments in neurotechnology in national security and defense agendas are impacted by and affect ethical values and constructs, legal considerations, and overall conduct of the social sphere. Presenting an integrative perspective, leading international experts lay the scientific groundwork and establish the premises necessary to appreciate the ethical aspects of neurotechnology in national security and defense. It is not a question of "if" neurotechnology will be used in such ways, but when, how, and to what extent. Therefore, it is imperative to foster a deeper understanding of neurotechnology, the problems and debates arising from its use in national security and defense, and how such issues can and should be addressed. In doing so, we can guide and govern the use of these innovative neurotechnologies in ways that uphold ethical accountability.

A Cognitive Analysis of Armor Procedural Task Training - J. E. Morrison 1982

Traditional and performance-oriented approaches to procedural training were compared, and their deficiencies were noted. A cognitive interpretation of procedural learning was advanced and training implications were discussed. Representative armor procedures were analyzed to derive the underlying memory structures required for recall. Specific training

applications of the memory structures were also discussed. (Author).

Systems Engineering - Dahai Liu 2018-10-08

For the past several decades, systems engineering has grown rapidly in its scope and application and shown significant benefits for the design of large, complex systems. However, current systems engineering textbooks are either too technical or at a high conceptual level. Written by an expert with more than ten years of teaching experience, *Systems Engineering: Design Principles and Models* not only gives students exposure to the concepts of systems and systems engineering, but also provides enough technical expertise for them to immediately use and apply what they learn. The book covers systems and systems engineering, systems methods, models, and analytical techniques as well as systems management and control methods. It discusses systems concepts, emphasizing system life cycle, and includes coverage of systems design processes and the major activities involved. It offers hands-on exercises after each chapter, giving students a solid understanding of system requirements, and uses a software package (CORE) to introduce the requirement management process. Designed for readers with a wide range of backgrounds, the book enables students to learn about systems and systems engineering, and, more specifically, to be able to use and apply the models and methods in the systems engineering field. The author has integrated feedback from students with materials used in teaching for many years, making the book especially approachable to non-engineering students with no prior exposure to this subject. Engineering students, on the other hand, will also benefit from the clear, concise coverage this book provides as well as the relevant analysis models and techniques.

Designing for Performance: A Cognitive Systems Engineering Approach to Modifying an AWACS Human Computer Interface - 1993

Cognitive Systems Engineering (CSE) is primarily a blend of technological opportunities, findings from cognitive research, and Cognitive Task Analysis. Using CSE, we were able to produce an efficient and effective redesign of the AWACS weapons Director (WD) station. The revised WD station was tested using 17 WDs. These WDs performed Defensive Counter Air Missions with both the current interface and the revised interface. The training of the participants on the revised interface was quite brief (4.5 hours). As a result, the WDs did not achieve the same degree of familiarity or automation with the revised interface that they have with the current interface. Yet, when WDs were using the revised system, their performance improved. This is indicated by an increase in performance for a number of process and outcome measures. Also, a skilled WD provided blind ratings of WD performance. These global ratings were significantly higher for the revised interface. The effectiveness of the revised interface suggests that it is possible to pinpoint cognitive task requirements and to make these the driving factors in a design effort. The use of CSE may be a feasible aspect of the design process, enabling system developers to achieve a much stronger effectiveness at relatively low cost.

Conference Proceedings: Aptitude, Learning, and Instruction. Volume 2. Cognitive Process Analyses of Learning and Problem Solving - Richard E. Snow 1981
Contents: Some Examples of Cognitive Task Analysis with Instructional Implications; An Elaborative Conception of Learner Differences; Event-Related Potentials: Approaches to Cognitive Psychology; Process Analyses of Learning and Problem Solving; A Representation for Formalizing Analogies and Semantic Models of Procedural Skills; A Theory-Based Approach to the Study of Individual Differences in Mental Imagery; Multiple Conceptual Models of a Complex System; Complex Learning Processes; Teaching, Learning, and the Representation of

Knowledge; Models of Concept Formation; Learning Theory, Instructional Theory, and Adaptation; Coordinating Research Topics; and Relationships Between Aptitude, Learning, and Instruction.

Human Factors Methods - Neville A. Stanton 2017-09-18

This second edition of *Human Factors Methods: A Practical Guide for Engineering and Design* now presents 107 design and evaluation methods as well as numerous refinements to those that featured in the original. The book has been carefully designed to act as an ergonomics methods manual, aiding both students and practitioners. The eleven sections represent the different categories of ergonomics methods and techniques that can be used in the evaluation and design process. Offering a 'how-to' text on a substantial range of ergonomics methods that can be used in the design and evaluation of products and systems, it is a comprehensive point of reference for all these methods. An overview of the methods is presented in chapter one, with a methods matrix showing which can be used in conjunction. The following chapters detail the methods showing how to apply them in practice. Flowcharts, procedures and examples cover the requirements of a diverse audience and varied applications of the methods. The final chapter, a new addition, illustrates the EAST method, which integrates several well-known methods into a teamwork analysis approach.

Scientific and Technical Aerospace Reports - 1995

Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database.

A Framework of Human Systems Engineering - Holly A. H. Handley 2020-12-01

Explores the breadth and versatility of Human Systems Engineering (HSE) practices and illustrates its value in system development. *A Framework of Human Systems Engineering: Applications and Case Studies* offers a guide to identifying and improving methods to integrate human concerns into the conceptualization and design of systems. With contributions from a panel of noted experts on the topic, the book presents a series of Human Systems Engineering (HSE) applications on a wide range of topics: interface design, training requirements, personnel capabilities and limitations, and human task allocation. Each of the book's chapters present a case study of the application of HSE from different dimensions of socio-technical systems. The examples are organized using a socio-technical system framework to reference the applications across multiple system types and domains. These case studies are based in real-world examples and highlight the value of applying HSE to the broader engineering community. This important book: Includes a proven framework with case studies to different dimensions of practice, including domain, system type, and system maturity. Contains the needed tools and methods in order to integrate human concerns within systems. Encourages the use of Human Systems Engineering throughout the design process. Provides examples that cross traditional system engineering sectors and identifies a diverse set of human engineering practices. Written for systems engineers, human factors engineers, and HSI practitioners, *A Framework of Human Systems Engineering: Applications and Case Studies* provides the information needed for the better integration of human and systems and early resolution of issues based on human constraints and limitations.

Agent-based Training: Facilitating Knowledge and Skill Acquisition in a Modern Space Operations Team - 2002

The U.S. Air Force is in the process of implementing a substantially larger role for space operations and a new operations system, the space-based infrared system (SBIRS), to accompany that role. Despite the increased responsibility that will accompany this new role and the

implementation of SBIRS, increases in satellite operations personnel may not occur and if they do, they are unlikely to be commensurate with the increase in responsibility. In this effort we have identified SBIRS System Crew Chief (SCCH) task performance demands that are likely to be worsened by the pending increase in workload but which, if managed well, can reduce its negative impact. These task demands are event prioritization, task allocation, and team communications. In this paper, we describe the design stages and design of a training and performance support system, the Adaptive Decision Enabling and Performance Tracking Toolkit (ADEPTT), that will assist the SCCH manage team coordination and perform the aforementioned tasks in particular during high workload periods. ADEPTT will be built using a cognitive agent architecture and will have four major components: 1. supervisory agents, 2. an instructional agent, 3. a crew communication tool, and 4. synthetic teammates - in order to provide comprehensive training and performance support. It is our goal to build ADEPTT so that it is maximally supportive, minimally obtrusive, has a minimal learning curve, and integrates easily into current training and operations. In designing this toolkit, we followed human-centered design principles, taking into account the demands and limitations operators already face, and being careful to not add to existing problems such as limited display space. This required us to work closely with members of the SBIRS operational community and use research tools such as cognitive task analysis methods.

The Handbook of Task Analysis for Human-Computer Interaction - Dan Diaper 2003-09-01

A comprehensive review of the current state of research and use of task analysis for Human-Computer Interaction (HCI), this multi-authored and diligently edited handbook offers the best reference source available on this diverse subject whose foundations date to the turn of the last century. Each chapter begins with an abstract and is cross-referen

Psychometric Tests as Cognitive Tasks: A New 'Structure of Intellect'. - 1974

After consideration of the drawbacks of such psychometrically derived theories of cognitive abilities as those of Guttman, Cattell, and Guilford, appeal is made to E.B. Hunt's 'distributive memory' model and A. Newell's concept of the 'production system' as possible bases for developing an alternative theory. Such a theory of cognitive abilities rests upon the individual differences displayed in the parameters of the tasks found in typical tests of intelligence. As first step toward developing a new 'structure of intellect' model, a detailed subjective analysis is made of the cognitive processes involved in two tests designed to measure each of the 24 factors in the 1963 version of the 'Kit of Reference Tests for Cognitive Factors'. It is held that the study of individual differences in abilities can profit greatly if it is closely tied to the experimental analysis of particular cognitive tasks; at the same time, work in the experimental tradition should pay close attention to the problem of identifying sources of variance that are due to individual differences in task parameters. (Modified author abstract).

Modelling and Simulation for Requirements Engineering and Options Analysis - 2010

This report presents the results of a scoping study that was conducted to develop a Research and Development roadmap for Project 14dj, "Modelling and Simulation for Requirements Engineering and Options Analysis." The purpose of Project 14dj is to develop a Modelling and Simulation capability, comprised of analytical techniques and software tools, for addressing human factors issues commonly encountered by Canadian Forces acquisition projects. This scoping study developed a roadmap for this research by developing insights and research questions from the current Canadian Forces

procurement process, the academic and applied literature on requirements engineering and options analysis, and through expert advice on how Cognitive Work Analysis could be applied to Canadian Forces procurement. Twenty-four research questions were developed, which are structured into five specific research proposals for Defence R & D Canada to consider for inclusion in Project 14dj. The research proposals are as follows: (1) research to apply Cognitive Work Analysis and Modelling and Simulation to the development of operational requirements; (2) research to conduct a cognitive task analysis of requirements engineering and options analysis in Canadian Forces procurement; (3) research to develop a tool to support the application of Cognitive Work Analysis to Canadian Forces procurement; (4) research to extend and apply Social Organization and Cooperation Analysis (a lesser-developed area of Cognitive Work Analysis) to Canadian Forces procurement; and (5) research to extend Defence R & D Canada-Toronto's crewing effectiveness task network model. The research program presented in this report should provide Defence R & D Canada with a stronger ability to have a positive impact on Canadian Forces procurement projects. If successful, this research could provide the Canadian Forces with an overall reduction of risk in the procurement cycle.

Work Design - Adedeji B. Badiru 2017-07-12

Work is all around us and permeates everything we do and everyday activities. Not all work is justified, not all work is properly designed, or evaluated accurately, or integrated. A systems model will make work more achievable through better management. Work is defined as a process of performing a defined task or activity, such as research, development, operations, maintenance, repair, assembly, production, and so on. Very little is written on how to design, evaluate, justify, and integrate work. Using a comprehensive systems approach, this book facilitates a better understanding of work for the purpose of making it more effective and rewarding.

From Cognitive Task Analysis to Simulation - 2005

To effectively study team variables as they impact performance in a particular domain, it is possible to develop medium fidelity simulations that abstract some details of the performance environment while maintaining others. This paper reports the results of a successful effort to create a synthetic task environment that captures key elements of a team task based on Cognitive Task Analysis of the important features of the task from a teamwork and cognition viewpoint. The authors studied the performance of AWACS Weapons Director (WD) teams and, based on the CTA data collected and insights from contemporary team theory, adapted an existing base simulation to mimic many of the crucial details of the task and its teamwork demands. The DDD simulator is a unique software tool set and computer system developed to study issues of distributed situation assessment and resource allocation in a dynamic team environment. As of this writing, the authors have run collected data using the DDD AWACS task and knowledgeable cadets from the U.S. Air Force Academy. They are in the process of demonstrating that it is possible to strike a balance between highly complex, large-scale, high fidelity simulations on the one hand, and over-controlled, overly simple laboratory research tasks on the other. Results of the research will inform team theory, system and organizational design, and continued research in the laboratory and field.

Online Aiding for Human-Computer Interfaces - Jay Elkerton 1987

Current research is surveyed on interfaces which aid the computer user online. Results show that many online aiding dialogues fall far short of the ultimate goal of helping users with their current problems, while also supporting continued skill acquisition at the computer interface. To address this problem, a task-analytic

approach is presented which is based on the GOMS model of human computer interaction. This model will provide an opportunity for usability problems to be identified analytically, as well as to allow assistance and instructional dialogues to be simulated in order to

predict improvements due to online aiding. Keywords: Human-computer interaction, Online aiding, Assistance dialogues, Instructional dialogues, Online training, Help systems, Tutorials, Task analysis, Cognitive models.