Read PDF An Assessment Of Space Shuttle Flight Software Development Processes

Recognizing the habit ways to acquire this books **An Assessment Of Space Shuttle Flight Software Development Processes** is additionally useful. You have remained in right site to begin getting this info. get the An Assessment Of Space Shuttle Flight Software Development Processes associate that we have enough money here and check out the link.

You could buy lead An Assessment Of Space Shuttle Flight Software Development Processes or get it as soon as feasible. You could speedily download this An Assessment Of Space Shuttle Flight Software Development Processes after getting deal. So, in the same way as you require the ebook swiftly, you can straight get it. Its in view of that utterly easy and for that reason fats, isnt it? You have to favor to in this tune

KEY=OF - ALEXANDER KARLEE

An Assessment of Space Shuttle Flight Software Development Processes National Academies Press **Effective software is essential to the success and safety of the Space Shuttle, including its crew and its payloads. The on-board software continually monitors and controls critical systems throughout a Space Shuttle flight. At NASA's request, the committee convened to review the agency's flight software development processes and to recommend a number of ways those processes could be improved. This book, the result of the committee's study, evaluates the safety, oversight, and management functions that are implemented currently in the Space Shuttle program to ensure that the software is of the highest quality possible. Numerous recommendations are made regarding safety and management procedures, and a rationale is offered for continuing the Independent Verification and Validation effort that was instituted after the Challenger Accident. Assessment of Space Shuttle Flight Software Development Processes Finite-state Analysis of Space Shuttle Contingency Guidance Requirements Monthly Catalogue, United States Public Documents Scientific and Technical Aerospace Reports Monthly Catalog of United States Government Publications Upgrading the Space Shuttle** National Academies Press **The space shuttle is a unique national resource. One of only two operating vehicles that carries humans into space, the space shuttle functions as a scientific laboratory and as a base for construction, repair, and**

salvage missions in low Earth orbit. It is also a heavy-lift launch vehicle (able to deliver more than 18,000 kg of payload to low Earth orbit) and the only current means of returning large payloads to Earth. Designed in the 1970s, the shuttle has frequently been upgraded to improve safety, cut operational costs, and add capability. Additional upgrades have been proposed-and some are under way-to combat obsolescence, further reduce operational costs, improve safety, and increase the ability of the National Aeronautics and Space Administration (NASA) to support the space station and other missions. In May 1998, NASA asked the National Research Council (NRC) to examine the agency's plans for further upgrades to the space shuttle system. The NRC was asked to assess NASA's method for evaluating and selecting upgrades and to conduct a top-level technical assessment of proposed upgrades. Software Evolution and Feedback Theory and Practice John Wiley & Sons Evolution of software has long been recognized as one of the most problematic and challenging areas in the field of software engineering, as evidenced by the high, often up to 60-80%, life-cycle costs attributed to this activity over the life of a software system. Studies of software evolution are central to the understanding and practice of software development. Yet it has received relatively little attention in the field of software engineering. This book focuses on topics aimed at giving a scientific insight into the aspect of software evolution and feedback. In summary, the book covers conceptual, phenomenological, empirical, technological and theoretical aspects of the field of software evolution - with contributions from the leading experts. This book delivers an up-to-date scientific understanding of what software evolution is, to show why it is inevitable for real world applications, and it demonstrates the role of feedback in software development and maintenance. The book also addresses some of the phenomenological and technological underpinnings and includes rules and guidelines for increased software evolvability and, in general, sustainability of the evolution process. Software Evolution and Feedback provides a long overdue, scientific focus on software evolution and the role of feedback in the software process, making this the indispensable guide for all software practitioners, researchers and managers in the software industry. Evaluation of the Trajectory Operations Applications Software Task (Toast). Volume 2 Interview Transcripts Createspace Independent Publishing Platform The Trajectory Operations Applications Software Task (TOAST) is a software development project whose purpose is to provide trajectory operation pre-mission and real-time support for the Space Shuttle. The purpose of the evaluation was to evaluate TOAST as an Application Manager - to assess current and planned capabilities, compare capabilities to commercially-available off the shelf (COTS) software, and analyze requirements of MCC and Flight Analysis Design System (FADS) for TOAST implementation. As a major part of the data gathering for the evaluation, interviews were conducted with NASA and contractor personnel. Real-time and flight design users, orbit navigation users, the TOAST developers, and management were interviewed. Code reviews and

demonstrations were also held. Each of these interviews was videotaped and transcribed as appropriate. Transcripts were edited and are presented chronologically. Perkins, Sharon and Martin, Andrea and Bavinger, Bill Unspecified Center APPLICATIONS PROGRAMS (COMPUTERS); COMPUTER PROGRAMMING; REAL TIME OPERATION; SOFTWARE ENGINEERING; TRAJECTORIES; CONTRACTORS; NAVIGATION; PERSONNEL; SPACE SHUTTLES; SURVEYS... Second Workshop on the Investigation and Reporting of Incidents and Accidents, IRIA 2003 Mechanizing Proof Computing, Risk, and Trust MIT Press Most aspects of our private and social lives—our safety, the integrity of the financial system, the functioning of utilities and other services, and national security—now depend on computing. But how can we know that this computing is trustworthy? In Mechanizing Proof, Donald MacKenzie addresses this key issue by investigating the interrelations of computing, risk, and mathematical proof over the last half century from the perspectives of history and sociology. His discussion draws on the technical literature of computer science and artificial intelligence and on extensive interviews with participants. MacKenzie argues that our culture now contains two ideals of proof: proof as traditionally conducted by human mathematicians, and formal, mechanized proof. He describes the systems constructed by those committed to the latter ideal and the many questions those systems raise about the nature of proof. He looks at the primary social influence on the development of automated proof—the need to predict the behavior of the computer systems upon which human life and security depend—and explores the involvement of powerful organizations such as the National Security Agency. He concludes that in mechanizing proof, and in pursuing dependable computer systems, we do not obviate the need for trust in our collective human judgment. Fiscal Year 2001 NASA Authorization NASA Posture, Parts I-VI : Hearing Before the Subcommittee on Space and Aeronautics of the Committee on Science, House of Representatives, One Hundred Sixth Congress, Second Session, February 16, March 16, March 22, April 11, May 10, and September 13, 2000 Statistical Software Engineering National Academies Press This book identifies challenges and opportunities in the development and implementation of software that contain significant statistical content. While emphasizing the relevance of using rigorous statistical and probabilistic techniques in software engineering contexts, it presents opportunities for further research in the statistical sciences and their applications to software engineering. It is intended to motivate and attract new researchers from statistics and the mathematical sciences to attack relevant and pressing problems in the software engineering setting. It describes the "big picture," as this approach provides the context in which statistical methods must be developed. The book's survey nature is directed at the mathematical sciences audience, but software engineers should also find the statistical emphasis refreshing and stimulating. It is hoped that the book will have the effect of seeding the field of statistical software engineering by its indication of opportunities where statistical thinking can help to increase

understanding, productivity, and quality of software and software production. Space Shuttle, NASA Should Implement Independent Oversight of Software Development Report to the Chairman, Committee on Science, Space, and Technology, House of Representatives Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations for 2001: National Aeronautics and Space Administration FME '96: Industrial Benefit and Advances in Formal Methods Third International Symposium of Formal Methods Europe Co-Sponsored by IFIP WG 14.3, Oxford, UK, March 18 - 22, 1996. Proceedings. Springer Science & Business Media **This book presents the refereed proceedings of the Third International Symposium of Formal Methods Europe, FME '96, held in Oxford, UK, in March 1996. FME '96 was co-sponsored by IFIP WG 14.3 and devoted to "the application and demonstrated industrial benefit of formal methods, their new horizons and strengthened foundations". The 35 full revised papers included were selected from a total of 103 submissions; also included are three invited papers. The book addresses all relevant aspects of formal methods, from the point of view of the industrial R & D professional as well as from the academic viewpoint, and impressively documents the significant progress in the use of formal methods for the solution of real-world problems. Space Transportation A Systems Approach to Analysis and Design AIAA Annotation This practical book gives young professionals all the information they need to know to get started in the space business. It takes you step-by-step through processes for systems engineering and acquisition, design and development, cost analysis, and program planning and analysis. You'll find the systems engineering and design process that applies to all space transportation systems, then the overall system architecture considerations that also apply to all space transportation systems. There is also detailed coverage of space launch vehicles by class, including the current space shuttle, other manned reusable systems, expendable systems, and future systems. A companion CD-ROM contains the Operations Simulation and Analysis Modeling System software. Using Formal Methods to Assist in the Requirements Analysis of the Space Shuttle GPS Change Request Columbia Accident Investigation Board Report Safety Design for Space Systems Butterworth-Heinemann Progress in space safety lies in the acceptance of safety design and engineering as an integral part of the design and implementation process for new space systems. Safety must be seen as the principle design driver of utmost importance from the outset of the design process, which is only achieved through a culture change that moves all stakeholders toward front-end loaded safety concepts. This approach entails a common understanding and mastering of basic principles of safety design for space systems at all levels of the program organisation. Fully supported by the International Association for the Advancement of Space Safety (IAASS), written by the leading figures in the industry, with frontline experience from projects ranging from the Apollo missions, Skylab, the Space Shuttle and the International Space Station, this book provides a comprehensive reference for aerospace engineers in**

industry. It addresses each of the key elements that impact on space systems safety, including: the space environment (natural and induced); human physiology in space; human rating factors; emergency capabilities; launch propellants and oxidizer systems; life support systems; battery and fuel cell safety; nuclear power generators (NPG) safety; habitat activities; fire protection; safety-critical software development; collision avoidance systems design; operations and on-orbit maintenance. * The only comprehensive space systems safety reference, its must-have status within space agencies and suppliers, technical and aerospace libraries is practically guaranteed * Written by the leading figures in the industry from NASA, ESA, JAXA, (et cetera), with frontline experience from projects ranging from the Apollo missions, Skylab, the Space Shuttle, small and large satellite systems, and the International Space Station. * Superb quality information for engineers, programme managers, suppliers and aerospace technologists; fully supported by the IAASS (International Association for the Advancement of Space Safety) Computer Program Abstracts Launch Vehicle Design Process: Characterization, Technical Integration, and Lessons Learned Columbia Accident Investigation Board: (issued with CD-ROM) Columbia Accident Investigation Board, Report Volume 2, October 2003, * (NOTE: DISTRIBUTION LIMITED TO REGIONAL LIBRARIES ONLY). Designing for Change Minimizing the Impact of Changing Requirements in the Later Stages of a Spaceflight Software Project Createspace Independent Publishing Platform In the traditional 'waterfall' model of the software project life cycle, the Requirements Phase ends and flows into the Design Phase, which ends and flows into the Development Phase. Unfortunately, the process rarely, if ever, works so smoothly in practice. Instead, software developers often receive new requirements, or modifications to the original requirements, well after the earlier project phases have been completed. In particular, projects with shorter than ideal schedules are highly susceptible to frequent requirements changes, as the software requirements analysis phase is often forced to begin before the overall system requirements and top-level design are complete. This results in later modifications to the software requirements, even though the software design and development phases may be complete. Requirements changes received in the later stages of a software project inevitably lead to modification of existing developed software. Presented here is a series of software design techniques that can greatly reduce the impact of last-minute requirements changes. These techniques were successfully used to add built-in flexibility to two complex software systems in which the requirements were expected to (and did) change frequently. These large, real-time systems were developed at NASA Langley Research Center (LaRC) to test and control the Lidar In-Space Technology Experiment (LITE) instrument which flew aboard the space shuttle Discovery as the primary payload on the STS-64 mission. Allen, B. Danette Langley Research Center SOFTWARE ENGINEERING; COMPUTER PROGRAMMING; REAL TIME OPERATION; SCHEDULES; DISCOVERY (ORBITER); SPACE TRANSPORTATION SYSTEM; SPACE SHUTTLES; SPACE

FLIGHT; OPTICAL RADAR; COMPLEX SYSTEMS... Research and Development Annual Report, 1992 Statistical Software Engineering <u>National Academies Press</u> **This book identifies challenges and opportunities in the development and implementation of software that contain significant statistical content. While emphasizing the relevance of using rigorous statistical and probabilistic techniques in software engineering contexts, it presents opportunities for further research in the statistical sciences and their applications to software engineering. It is intended to motivate and attract new researchers from statistics and the mathematical sciences to attack relevant and pressing problems in the software engineering setting. It describes the "big picture," as this approach provides the context in which statistical methods must be developed. The book's survey nature is directed at the mathematical sciences audience, but software engineers should also find the statistical emphasis refreshing and stimulating. It is hoped that the book will have the effect of seeding the field of statistical software engineering by its indication of opportunities where statistical thinking can help to increase understanding, productivity, and quality of software and software production. A Gift of Fire Social, Legal, and Ethical Issues for Computing and the Internet** <u>Prentice Hall</u> **Gift of Fire is ideal for courses in Computer Ethics and Computers and Society. In this revision of a best-seller, Baase explores the social, legal, philosophical, ethical, political, constitutional, and economic implications of computing and the controversies they raise. With a computer scientist's perspective, and with historical context for many issues, she covers the issues readers will face both as members of a technological society and as professionals in computer-related fields. A primary goal is to develop computer professionals who understand the implications of what they create and how it fits into society at large. Computers Take Flight A History of Nasa's Pioneering Digital Fly-by-Wire Project** <u>United States Government Printing</u> **Exploring the Unknown: Organizing for exploration Software Measurement Current Trends in Research and Practice** <u>Springer Science & Business Media</u> **Software developers are faced with the challenge of making software systems and products of ever greater quality and safety, while at the same time being faced with the growing pressure of costs reduction in order to gain and maintain competitive advantages. As in any scientific and engineering discipline, reliable measurement is essential for talking on such a challenge. "Software measurement is an excellent abstraction mechanism for learning what works and what doesn't" (Victor Basili). Measurement of both software process and products provides a large amount of basic information for the evaluation of the software development processes or the software products themselves. Examples of recent successes in software measurement span multiple areas, such as evaluation of new development methods and paradigms, quality and management improvement programs, tool-supporting initiatives and company wide measurement programs. The German Computer Science Interest (GI) Group of Software Metrics and the Canadian Interest Group in Software Metrics (CIM) have attended to**

these concerns in the recent years. Research initiatives were directed initially to the definition of software metrics and then to validation of the software metrics themselves. This was followed by more and more investigation into practical applications of software metrics and by critical analysis of the benefits and weaknesses of software measurement programs. Key findings in this area of software engineering have been published in some important books, such as Dumke and Zuse's Theory and Practice of Software Measurement, Ebert and Dumke's Software Metrics in Practice and Lehner, Dumke and Abran's Software Metrics. Post-Challenger Evaluation of Space Shuttle Risk Assessment and Management National Academies Space Exploration and Astronaut Safety Amer Inst of Aeronautics & Part history, part technology, and part policy analysis, this one-of-a-kind, landmark book reviews the history of NASA's space exploration program, its astronaut safety program, the present status of the Space Shuttle and the International Space Station, and the options and strategic opportunities that present themselves as NASA enters its next phase of space exploration with Project Constellation. Written by one of the foremost experts on space policy, Space Exploration and Astronaut Safety, presents in a highly readable format the state of today's space technology, along with the concerns about safety in space exploration as it applies to current and future programs, and whether these issues can be reconciled and translated into a viable future space policy. The book thoroughly explores NASA's options and how these options are tempered and influenced by astronaut safety considerations as well as by uncertain Congressional funding and complex organizational management issues. It also considers the impact of international participation and the increasing prospect of the privatization of space travel. Shuttle tragedies, interviews with key experts, surveys, and extensive research on the Shuttle, ISS, and related NASA space safety programs, the author lays out a comprehensive presentation on where space exploration has been, where it stands today, where it is going, and where it has the potential to go. Decision makers in government (especially those involved with NASA policy and safety), members of space agencies around the world, aerospace scientists and engineers, space enthusiasts, and academicians will all find this book an indispensable and enlightening guide. Investment in the future of space exploration will cost billions of dollars; this book provides ample background and the impetus to enable policy makers, the aerospace community, and the general public to make balanced, educated decisions on how those dollars can best be spent. Evaluation of the Trajectory Operations Applications Software Task (Toast) The Trajectory Operations Applications Software Task (TOAST) is a software development project under the auspices of the Mission Operations Directorate. Its purpose is to provide trajectory operation pre-mission and real-time support for the Space Shuttle program. As an Application Manager, TOAST provides an isolation layer between the underlying Unix operating system and the series of user programs. It provides two main services: a common interface to operating system functions with

semantics appropriate for C or FORTRAN, and a structured input and output package that can be utilized by user application programs. In order to evaluate TOAST as an Application Manager, the task was to assess current and planned capabilities, compare capabilities to functions available in commercially-available off the shelf (COTS) and Flight Analysis Design System (FADS) users for TOAST implementation. As a result of the investigation, it was found that the current version of TOAST is well implemented and meets the needs of the real-time users. The plans for migrating TOAST to the X Window System are essentially sound; the Executive will port with minor changes, while Menu Handler will require a total rewrite. A series of recommendations for future TOAST directions are included. Perkins, Sharon and Martin, Andrea and Bavinger, Bill Unspecified Center... Field Guide for Designing Human Interaction with Intelligent Systems The characteristics of this field guide approach address the problems of designing innovative software to support user tasks. The requirements for novel software are difficult to specify a priori, because there is not sufficient understanding of how the users' tasks should be supported, and there are not obvious pre-existing design solutions. When the design team is in unfamiliar territory, care must be taken to avoid rushing into detailed design, requirements specification, or implementation of the wrong product. The challenge is to get the right design and requirements in an efficient, cost-effective manner. This document's purpose is to describe the methods we are using to design human interactions with intelligent systems which support Space Shuttle flight controllers in the Mission Control Center at NASA/Johnson Space Center. Although these software systems usuallyu have some intelligent features, the design challenges arise primarily from the innovation needed in the software design. While these methods are tailored to our specific context, they should be extensible, and helpful to designers of human interaction with other types of automated systems. We review the unique features of this context so that you can determine how to apply these methods to your project. Throughout this field guide, goals of the design methods are discussed. This should help designers understand how a specific method might need to be adapted to the project at hand. Report to the President A Framework of Software Measurement Walter de Gruyter JSC Director's Discretionary Fund Program Report of the Presidential Commission on the Space Shuttle Challenger Accident DIANE Publishing Reviews the circumstances surrounding the Challenger accident to establish the probable cause or causes of the accident. Develops recommendations for corrective or other action based upon the Commission1s findings and determinations. Color photos, charts and tables. News Report