Conceptual Design And Analysis Of High Pressure Ball Valve

Conceptual designs and associated technologies for deployment 100 m class radiometer antennas were developed. An electrostatically suspended and controlled membrane mirror and the supporting structure are discussed. The integrated spacecraft including STS cargo bay stowage and development were analyzed. An antenna performance evaluation was performed as a measure of the quality of the membrane/spacecraft when used as a radiometer in the 1 GHz to 5 GHz region. Several related LSS structural dynamic models differing by their stiffness property (and therefore, lowest modal frequencies) are reported. Control system whose complexity varies inversely with increasing modal frequency regimes are also reported. Interactive computer-aided-design software is discussed.

Conceptual Design and Analysis of a Special Operations TransportProgress in Conceptual Design and Analysis of Advanced RotorcraftBiblioGov

A horizon detection logic, based on a ratio-of-integrated-radiance concept, which detects the earth's horizon at a relatively stable height under all geographic and meteorological conditions was evaluated by computer simulation on a body of synthesized radiance profiles. An error-sensitivity

analysis of the concept was performed, and optimum design parameter values for a sensor were determined. A conceptual design for an improved 15 micron sensor based on this analysis is discussed.

This presentation will give information on Multi-Disciplinary Analysis and Technology Development, including it's objectives and how they will be met. In addition, it will also present recent highlights including the Lift-Offset Civil Design and it's study conclusions, as well as, the LCTR2 Propulsion Concept's study conclusions. Recent publications and future publications will also be discussed.

This study addresses the feasibility of using electronic imaging technology for aeroballistics research. Electronic imaging devices are analyzed with respect to range system characteristics. Optical imaging and illumination parameters in the existing system are defined and quantified. System imaging capability is measured and described by modern imaging systems analysis in terms of the system response to a step function input. Two independent measurements that determine system illumination are described and supporting analysis is included. Concepts critical to data analysis are discussed, along with a survey of available hardware that will image and process projectile flight path data. Recommendations pertinent to the selection of hardware and the overall system organization and maintenance are made.

This introduction to the offshore industry examines design factors for control systems in this unique environment. The author describes the benefits of

offshore control systems, provides guidelines for the development of an optimum conceptual design, and explores design standardization.

The objective of the low NOx burner design and analysis task of the Conceptual Design of Oxygen-Based PC Boiler study is to optimize the burner design to ensure stable ignition, to provide safe operation, and to minimize pollutant formation. The burners were designed and analyzed using the Fluent computer program. Four burner designs were developed: (1) with no over-fire gas (OFG) and 65% flue gas recycle, (2) with 20% OFG and 65% flue gas recycle, (3) with no OFG and 56% flue gas recycle and (4) with 20% OFG and 56% flue gas recycle. A 3-D Fluent simulation was made of a single wall-fired burner and horizontal portion of the furnace from the wall to the center. Without primary gas swirl, coal burnout was relatively small, due to the low oxygen content of the primary gas stream. Consequently, the burners were modified to include primary gas swirl to bring the coal particles in contact with the secondary gas. An optimal primary gas swirl was chosen to achieve sufficient burnout.

Nowadays, there is a growing need for high performance flying drones with diverse capabilities for both civilian and military applications. There is also a significant interest in the development of efficient drones which can autonomously fly in different environments and locations, such as other planets. In the past decade, the broad spectrum of applications of these drones has received most attention which led to the invention of various types of drones with different sizes and weights. Therefore, in

chapter 1 as introduction, we identify a novel classification of flying drones that ranges from unmanned air vehicles to smart dusts at both ends of this spectrum, with their new defined applications. Design and fabrication challenges of micro drones, and existing methods for increasing their endurance are consolidated and discussed. Limitations of the existing drones, proposed solutions and recommendations for the next generation of drones are also presented in chapter 1. The next generation of space observatories will use larger mirrors while meeting tighter optical performance requirements than current space telescopes. The spacecraft designs must satisfy the drive for low-mass, low-cost systems, and be robust to uncertainty since design validation will be based on analysis instead of pre-launch tests. Analytical techniques will be required to identify which technologies or structural architectures are most appropriate to meet conflicting system requirements, but traditionally, model-based dynamic analysis would only take place after a single point design is chosen. The challenges facing future space telescopes require a new approach to conceptual design, and motivate the creation of design tools to identify superior, robust designs earlier in the design lifecycle using model-based analysis methods. A conceptual design methodology is proposed, in which both nominal performance as well as robustness to uncertainty are evaluated across multiple design realizations. A modeling environment is created so that for any set of design variables, such as mirror architecture or dimensions of the spacecraft, a finite element model is

automatically generate and analyzed.

Flexure mechanisms are the central part of precision instruments and devices for numerous science and engineering applications. Currently, design of flexure mechanisms often heavily relies on finite element modeling. However the modeling complexity and low computational efficiency make it not suitable for the early design stage when many concepts need to be evaluated in a short period of time. To reduce the overhead in the conceptual design stage,a multi-segment energy minimization framework that integrates linear elastic theory for kinetostatic analysis of spatial flexure mechanisms is presented in this work. Compliance matrices for commonly used flexure elements are presented and their accuracy was studied and verified in details. While deformation of each individual segment depends on the linear elastic theory, the multi-segment model allows accurate calculation of large deformations with a high computational efficiency. To facilitate modeling of spatial flexure mechanisms, a rich Graphical User Interface (DAS3D) in MATLAB environment is implemented. The proposed framework and software tool are tested with spatial mechanisms in which nonlinear kinematic constraints and combined loading are present. The examples showed that the proposed multi-segment framework can accurately capture large kinematic motion under complex loading.

Conceptual Design of Multichip Modules and Systems treats activities which take place at the conceptual and specification level of the design of complex multichip systems. These activities include the formalization of

design knowledge (information modeling), tradeoff analysis, partitioning, and decision process capture. All of these functions occur prior to the traditional CAD activities of synthesis and physical design. Inherent in the design of electronic modules are tradeoffs which must be understood before feasible technology, material, process, and partitioning choices can be selected. The lack of a complete set of technology information is an especially serious problem in the packaging and interconnect field since the number of technologies, process, and materials is substantial and selecting optimums is arduous and non-trivial if one truly wants a balance in cost and performance. Numerous tradeoff and design decisions have to be made intelligently and quickly at the beginning of the design cycle before physical design work begins. These critical decisions, made within the first 10% of the total design cycle, ultimately define up to 80% of the final product cost. Conceptual Design of Multichip Modules and Systems lays the groundwork for concurrent estimation level analysis including size, routing, electrical performance, thermal performance, cost, reliability, manufacturability, and testing. It will be useful both as a reference for system designers and as a text for those wishing to gain a perspective on the nature of packaging and interconnect design, concurrent engineering, computer-aided design, and system synthesis.

This report documents the conceptual design study performed to evaluate design options for a subscale dynamic test model which could be used to investigate the expected on-orbit structural dynamic characteristics

of the Space Station Freedom early build configurations. The baseline option was a 'near-replica' model of the SSF SC-7 pre-integrated truss configuration. The approach used to develop conceptual design options involved three sets of studies: evaluation of the full-scale design and analysis databases, conducting scale factor trade studies, and performing design sensitivity studies. The scale factor trade study was conducted to develop a fundamental understanding of the key scaling parameters that drive design, performance and cost of a SSF dynamic scale model. Four scale model options were estimated: 1/4, 1/5, 1/7, and 1/10 scale. Prototype hardware was fabricated to assess producibility issues. Based on the results of the study, a 1/4-scale size is recommended based on the increased model fidelity associated with a larger scale factor. A design sensitivity study was performed to identify critical hardware component properties that drive dynamic performance. A total of 118 component properties were identified which require high-fidelity replication. Lower fidelity dynamic similarity scaling can be used for non-critical components. Davis, D. A. and Gronet, M. J. and Tan, M. K. and Thorne, J. Unspecified Center DESIGN ANALYSIS; DYNAMIC CHARACTERISTICS; DYNAMIC MODELS; SCALE MODELS; SPACE STATION FREEDOM; SPACECRAFT DESIGN; DYNAMIC TESTS; SPACECRAFT CONFIGURATIONS; TRUSSES...

Conventional robotic actuators which motive power for manipulators have been commonly limited to three basic types: electric, pneumatic and hydraulic.

Each type has advantages and limitations which have dictated their respective suitability for specific applications. However, new manipulator functions may require such qualities as stiffness, high speed, low weight, low inertia, high power output, reversibility, and accurate positioning, which are not usually mutually compatible within an actuator type. With the increased use of robots in industry and the military, new robot-specific actuators will be developed to better meet functional requirements. One concept to be considered is a stiff pneumatic-hydraulic actuator for mobile anthropomorphic robot application. This paper explores the conceptual design feasibility of such an actuator system, and presents a first order system analysis of key parts. This 2001 book covers theory and applications of conceptual design, the initial stage of engineering design.