

# Free read Engine icing simulation and detection nasa (2023)

impacts by earth approaching asteroids and comets pose a significant hazard to life and property although the annual probability of the earth being struck by a large asteroid or comet is extremely small the consequences of such a collision are so catastrophic that it is prudent to assess the nature of the threat and to prepare to deal with it the first step in any program for the prevention or mitigation of impact catastrophes must involve a comprehensive search for earth crossing asteroids and comets and a detailed analysis of their orbits at the request of the u s congress nasa has carried out a preliminary study to define a program for dramatically increasing the detection rate of earth crossing objects as documented in this workshop report morrison david editor ames research center the committee for the review of nasa s pioneering revolutionary technology prt program and its three supporting panels were charged by the national aeronautics and space administration nasa with assessing the overall scientific and technical quality of the prt program and its component programs along with their associated elements and individual research tasks major issues addressed in the review include 1 research portfolios 2 research plans 3 technical community connections 4 methodologies and 5 overall capabilities as reflected in the organization of the report a two pronged assessment was developed each panel provided a detailed assessment of the program under its purview which was refined and updated over the course of the review the committee composed mainly of representatives from each panel integrated and

evaluated the panel results and provided top level advice on issues cutting across the entire prt program two optically based flame detection systems have been developed for use in nasa langley s 8 foot high temperature tunnel 8 ft htt these systems are used to detect the presence and stability of the main burner and pilot level flames during facility operation system design considerations will be discussed and a detailed description of the system components and circuit diagrams will be provided in the appendices of this report a more detailed description of the manufacturing process used in the fabrication of the fiber optic probes is covered in nasa tm 2001 211233 borg stephen e langley research center nasa tm 2005 213755 l 19104 the search for our universal brethren is on man is looking for them now how will we find them what will we do when we do two books developed by nasa printed in one book the united states is currently the only country with an active government sponsored effort to detect and track potentially hazardous near earth objects neos congress has mandated that nasa detect and track 90 percent of neos that are 1 kilometer in diameter or larger these objects represent a great potential hazard to life on earth and could cause global destruction nasa is close to accomplishing this goal congress has more recently mandated that by 2020 nasa should detect and track 90 percent of neos that are 140 meters in diameter or larger a category of objects that is generally recognized to represent a very significant threat to life on earth if they strike in or near urban areas achieving this goal may require the building of one or more additional observatories possibly including a space based observatory congress directed nasa to ask the national research council to review nasa s near earth object programs this interim report addresses some of the issues associated with the survey and detection of neos the final report will contain findings and recommendations for survey and detection

characterization and mitigation of near earth objects based on an integrated assessment of the problem summary evaluations of the performance of laminar flow control lfc leading edge test articles on a nasa jetstar aircraft are presented statistics presented for the test articles performance in haze and cloud situations as well as in clear air show a significant effect of cloud particle concentrations on the extent of laminar flow the cloud particle environment was monitored by two instruments a cloud particle spectrometer knollenberg probe and a charging patch both instruments are evaluated as diagnostic aids for avoiding laminar flow detrimental particle concentrations in future lfc aircraft operations the data base covers 19 flights in the simulated airline service phase of the nasa leading edge flight test left program davis richard e and maddalon dal v and wagner richard d and fisher david f and young ronald ames research center armstrong flight research center langley research center southwest research institute swri recently fabricated and delivered the 100 channel ultrasonic phased array testbed system upats for nasa s langley research center nasa prepared the specifications and provided the funding to develop upats in order to provide a tool for the improvement of ultrasonic nondestructive evaluation nde and characterization of materials upats incorporates state of the art phased array concepts such as beam steering focusing apodization and phase sensitive detection which make it possible to develop more sophisticated testing methodologies it also can be used to investigate fundamental ultrasonic propagation and detection phenomena such as refraction diffraction scattering and beam broadening hanley john j and tennis richard f and pickens keith s langley research center nas1 19402 swri proj 17 9891 we have developed a fast response nanometer aerosol size analyzer nasa that is capable of scanning 30 size channels between 3 and 100

nm in a total time of 3 seconds the analyzer includes a bipolar charger p0210 an extended length nanometer differential mobility analyzer nano dma and an electrometer tsi 3068 this combination of components provides particle size spectra at a scan rate of 0.1 second per channel free of uncertainties caused by response time induced smearing the nasa thus offers a fast response for aerosol size distribution measurements in high concentration conditions and also eliminates the need for applying a de smearing algorithm to resulting data in addition because of its thermodynamically stable means of particle detection the nasa is useful for applications requiring measurements over a broad range of sample pressures and temperatures indeed experimental transfer functions determined for the extended length nano dma using the tandem differential mobility analyzer tdma technique indicate the nasa provides good size resolution at pressures as low as 200 torr also as was demonstrated in tests to characterize the soot emissions from the j85 ge engine of a t38 aircraft the broad dynamic concentration range of the nasa makes it particularly suitable for studies of combustion or particle formation processes further details of the nasa performance as well as results from calibrations laboratory tests and field applications are presented han hee siew and chen da ren and pui david y h and anderson bruce e langley research center aerosols algorithms combustion physics particle size distribution detection measuring instruments soot emissivity transfer functions stability j 85 engine electrometers the activities presented are a broad based approach to advancing key hydrogen related technologies in areas such as hydrogen production distributed sensors for hydrogen leak detection laser instrumentation for hydrogen leak detection and cryogenic transport and storage presented are the results form 15 research projects education and

outreach activities system and trade studies and project management the work will aid in advancing the state of the art for several critical technologies related to the implementation of a hydrogen infrastructure activities conducted are relevant to a number of propulsion and power systems for terrestrial aeronautics and aerospace applications anderson tim unspecified center nag3 2930 wbs 581 02 01 03 12 the search for extraterrestrial intelligence currently being planned by nasa will require that an enormous amount of data be analyzed in real time by special purpose hardware it is expected that overlapped hann data windows will play an important role in this analysis in order to understand the statistical implication of this approach it has been necessary to compute detection statistics for overlapped hann spectra tables of signal detection statistics are given for false alarm rates from  $10 \exp 14$  to  $10 \exp 1$  and signal detection probabilities from 0 50 to 0 99 the number of computed spectra ranges from 4 to 2000 deans stanley r and cullers d kent ames research center rtop 108 41 60 included are four documents that outline the technical aspects of the research performed on nasa grant nag8 140 a system for sequential step detection with application to video image processing leak detection from the ssme using sequential image processing digital image processor specifications for real time ssme leak detection and a color change detection system for video signals with applications to spectral analysis of rocket engine plumes crawford r a and smith l m unspecified center nasa the national aeronautics and space administration created in the wake of the space act has and continues to accomplish those precepts every day with many hundreds of satellites launched into space and close to 200 human spaceflights nasa is a proven leader in space exploration most of the us space exploration efforts have been led by nasa including the apollo moon landing

missions the skylab space station and later the space shuttle currently nasa is supporting the international space station and is overseeing the development of the orion multi purpose crew vehicle the space launch system and commercial crew vehicles nasa is also responsible for the launch services program which provides oversight of launch operations and countdown management for unmanned nasa launches the historical guide to nasa and the space program contains a chronology an introduction appendixes and an extensive bibliography the dictionary section has over 500 cross referenced entries on space missions astronauts technical terms space shuttles satellites and the international space station this book is an excellent access point for students researchers and anyone wanting to know more about nasa and space exploration to meet the objectives of the vision for space exploration vse nasa must develop a wide array of enabling technologies for this purpose nasa established the exploration technology development program etdp currently etdp has 22 projects underway in the report accompanying the house passed version of the fy2007 appropriations bill the agency was directed to request from the nrc an independent assessment of the etdp this interim report provides an assessment of each of the 22 projects including a quality rating an analysis of how effectively the research is being carried out and the degree to which the research is aligned with the vse to the extent possible the identification and discussion of various cross cutting issues are also presented those issues will be explored and discussed in more detail in the final report a computer based integrated knowledge based system the intelligent hypertext manual ihm was developed for the space shuttle hazardous gas detection system hgds at nasa marshall space flight center msfc the ihm stores hgds related knowledge and presents it in an interactive and intuitive manner this manual is a combination of hypertext and an expert

system which store experts knowledge and experience in hazardous gas detection and analysis the ihm s purpose is to provide hgds personnel with the capabilities of locating applicable documentation related to procedures constraints and previous fault histories assisting in the training of personnel enhancing the interpretation of real time data and recognizing and identifying possible faults in the space shuttle sub systems related to hazardous gas detection lo ching f and shi george z and bangasser carl and fensky connie and cegielski eric and overbey glenn unspecified center nasa cr 194533 nas 1 26 194533 nag8 835 this research was initiated as a part of the effort at the nasa ames research center to design a computer vision based system that can enhance the safety of navigation by aiding the pilots in detecting various obstacles on the runway during critical section of the flight such as a landing maneuver the primary goal is the development of algorithms for detection of moving objects from a sequence of images obtained from an on board video camera image regions corresponding to the independently moving objects are segmented from the background by applying constraint filtering on the optical flow computed from the initial few frames of the sequence these detected regions are tracked over subsequent frames using a model based tracking algorithm position and velocity of the moving objects in the world coordinate is estimated using an extended kalman filter the algorithms are tested using the nasa line image sequence with six static trucks and a simulated moving truck and experimental results are described various limitations of the currently implemented version of the above algorithm are identified and possible solutions to build a practical working system are investigated kasturi rangachar and camps octavia and tang yuan liang and devadiga sadashiva and gandhi tarak unspecified center a technique developed and evaluated for the detection and measurement of surface feature interfaces

in remotely acquired data is described a computer implementation of this technique has been effected to automatically process categorized data derived from various sources such as the landsat multispectral scanner and other scanner type sensors the basic elements of the operational theory of the technique are described together with details of the procedure an example application of the technique to the analysis of tidal shoreline length is given with a breakdown of manpower requirements faller k h johnson space center stennis space center nasa tr r 472 jsc s 467 rtop 177 55 89 00 72 the spitzer space observatory originally known as the space infrared telescope facility sirtf is the last of the four great observatories which also include the hubble space telescope the chandra x ray observatory and the compton gamma ray observatory developed over twenty years and dubbed the infrared hubble spitzer was launched in the summer of 2003 and has since contributed significantly to our understanding of the universe george rieke played a key role in spitzer and now relates the story of how that observatory was built and launched into space telling the story of this single mission within the context of nasa space science over two turbulent decades he describes how after a tortuous political trail to approval spitzer was started at the peak of nasa s experiment with streamlining and downsizing its mission development process termed faster better cheaper up to its official start and even afterward spitzer was significant not merely in terms of its scientific value but because it stood at the center of major changes in space science policy and politics through interviews with many of the project participants rieke reconstructs the political and managerial process by which space missions are conceived approved and developed he reveals that by the time spitzer had been completed a number of mission failures had undermined faith in faster better cheaper and a more conservative



approach was imposed rieke examines in detail the premises behind faster better cheaper their strengths and weaknesses and their ultimate impact within the context of nasa s continuing search for the best way to build future missions rieke s participant s perspective takes readers inside congress and nasa to trace the progress of missions prior to the excitement of the launch revealing the enormously complex and often disheartening political process that needs to be negotiated he also shares some of the new observations and discoveries made by spitzer in just its first year of operation as the only book devoted to the spitzer mission the last of the great observatories is a story at the nexus of politics and science shedding new light on both spheres as it contemplates the future of mankind s exploration of the universe this report is a brief summary of the status of work on the grant entitled in situ detection of tropospheric oh ho2 no2 and no by laser induced fluorescence in detection chambers at low pressures the first version of the instrument is essentially complete and operational for about six months and we continue to make improvements on the instrument sensitivity and reliability we are focusing our efforts on improving our understanding of the operating characteristics of the instrument particularly the inlet transmission for oh and ho2 the exact character of the air flow around and within the instrument and the efficiency of the chemical conversion of ho2 to oh we are also in the process of converting this laboratory instrument into a field worthy instrument that we can take to remote sites for measurements brune william h nasa cr 191916 nas 1 26 191916 nagl 1057 this paper presents a summary of the transmission diagnostics research work conducted at nasa lewis research center over the last four years in 1990 the transmission health and usage monitoring research team at nasa lewis conducted a survey to determine the critical needs of the diagnostics

community survey results indicated that experimental verification of gear and bearing fault detection methods improved fault detection in planetary systems and damage magnitude assessment and prognostics research were all critical to a highly reliable health and usage monitoring system in response to this a variety of transmission fault detection methods were applied to experimentally obtained fatigue data failure modes of the fatigue data include a variety of gear pitting failures tooth wear tooth fracture and bearing spalling failures overall results indicate that of the gear fault detection techniques no one method can successfully detect all possible failure modes the more successful methods need to be integrated into a single more reliable detection technique a recently developed method na4 in addition to being one of the more successful gear fault detection methods was also found to exhibit damage magnitude estimation capabilities zakajsek james j glenn research center rtop 505 62 36 the main objective was to demonstrate the potential of using an optical fiber interferometer ofi to detect surface flaws in aluminum samples standard ultrasonic excitation was used to generate rayleigh surface waves after the waves interacted with a defect the modified responses were detected using the ofi and the results were analyzed for time of flight and frequency content to predict the size and location of the flaws gilbert john a unspecified center nasa cr 186180 nas 1 26 186180 nag8 821 this book describes detection techniques used to search for and analyze gravitational waves gw it covers the whole domain of gw science starting from the theory and ending with the experimental techniques both present and future used to detect them the theoretical sections of the book address the theory of general relativity and of gw followed by the theory of gw detection the various sources of gw are described as well as the methods used to analyse them and to extract their physical

parameters it includes an analysis of the consequences of gw observations in terms of astrophysics as well as a description of the different detectors that exist and that are planned for the future with the recent announcement of gw detection and the first results from lisa pathfinder this book will allow non specialists to understand the present status of the field and the future of gravitational wave science the fire prevention detection and suppression fpds project is a technology development effort within the exploration technology development program of the exploration system missions directorate esmd that addresses all aspects of fire safety aboard manned exploration systems the overarching goal for work in the fpds area is to develop technologies that will ensure crew health and safety on exploration missions by reducing the likelihood of a fire or if one does occur minimizing the risk to the crew mission or system this is accomplished by addressing the areas of 1 fire prevention and material flammability 2 fire signatures and detection and 3 fire suppression and response this report describes the outcomes of this project from the formation of the exploration technology development program etdp in october 2005 to september 31 2010 when the exploration technology development program was replaced by the enabling technology development and demonstration program nasa s fire safety work will continue under this new program and will build upon the accomplishments described herein ruff gary a glenn research centerdetection fire prevention fires safety flammability safety management flame retardants fireproofing smoke detectors fire extinguishers nasa programs technology assessment risk assessment during gfy 91 draper laboratory was awarded a task by nasa jsc under contract number nas9 18426 to study and evaluate the potential for achieving safe autonomous landings on mars using an on board autonomous hazard detection and avoidance ahda system this report describes the results

of that study the ahda task had four objectives to demonstrate via a closed loop simulation the ability to autonomously select safe landing sites and the ability to maneuver to the selected site to identify key issues in the development of ahda systems to produce strawman designs for ahda sensors and algorithms and to perform initial trade studies leading to better understanding of the effect of sensor terrain viewing parameters on ahda algorithm performance this report summarizes the progress made during the first year with primary emphasis on describing the tools developed for simulating a closed loop ahda landing some cursory performance evaluation results are also presented pien homer unspecified center land remote sensing and global environmental change the science of aster and modis is an edited compendium of contributions dealing with aster and modis satellite sensors aboard nasa s terra and aqua platforms launched as part of the earth observing system fleet in 1999 and 2002 respectively this volume is divided into six sections the first three sections provide insights into the history philosophy and evolution of the eos aster and modis instrument designs and calibration mechanisms and the data systems components used to manage and provide the science data and derived products the latter three sections exclusively deal with aster and modis data products and their applications and the future of these two classes of remotely sensed observations safety assessment of new air traffic management systems is a main issue for civil aviation authorities standard techniques such as testing and simulation have serious limitations in new systems that are significantly more autonomous than the older ones this paper presents an innovative approach based on formal verification for establishing the correctness of conflict detection systems fundamental is the concept of trajectory which is a continuous path in the x y plane constrained by physical laws and operational requirements from the

model of trajectories the authors extract and formally prove high level properties that can serve as a framework to analyze conflict scenarios they use the ails alerting algorithm as a case study

## The Spaceguard Survey

2018-07-17

impacts by earth approaching asteroids and comets pose a significant hazard to life and property although the annual probability of the earth being struck by a large asteroid or comet is extremely small the consequences of such a collision are so catastrophic that it is prudent to assess the nature of the threat and to prepare to deal with it the first step in any program for the prevention or mitigation of impact catastrophes must involve a comprehensive search for earth crossing asteroids and comets and a detailed analysis of their orbits at the request of the u s congress nasa has carried out a preliminary study to define a program for dramatically increasing the detection rate of earth crossing objects as documented in this workshop report morrison david editor ames research center

## *NASA Technical Paper*

1977

the committee for the review of nasa s pioneering revolutionary technology prt program and its three supporting panels were charged by the national aeronautics and space administration nasa with assessing the overall scientific and technical quality of the prt program and its component programs along with their associated elements and individual research tasks major issues addressed in the review include 1 research portfolios 2 research plans 3 technical community connections 4 methodologies and 5 overall capabilities as reflected in the organization of the report a two pronged assessment was developed each panel provided a detailed assessment of the program

under its purview which was refined and updated over the course of the review the committee composed mainly of representatives from each panel integrated and evaluated the panel results and provided top level advice on issues cutting across the entire prt program

## **Review of NASA's Aerospace Technology Enterprise**

2003-11-21

two optically based flame detection systems have been developed for use in nasa langley s 8 foot high temperature tunnel 8 ft htt these systems are used to detect the presence and stability of the main burner and pilot level flames during facility operation system design considerations will be discussed and a detailed description of the system components and circuit diagrams will be provided in the appendices of this report a more detailed description of the manufacturing process used in the fabrication of the fiber optic probes is covered in nasa tm 2001 211233 borg stephen e langley research center nasa tm 2005 213755 l 19104

## ***The Spaceguard Survey: Report of the NASA International Near-Earth-Object Detection Workshop***

1992

the search for our universal brethren is on man is looking for them now how will we find them what will we do when we do two books developed by nasa printed in one book

## **Optically Based Flame Detection in the NASA Langley 8-Ft High-Temperature Wind Tunnel**

2018-06-24

the united states is currently the only country with an active government sponsored effort to detect and track potentially hazardous near earth objects neos congress has mandated that nasa detect and track 90 percent of neos that are 1 kilometer in diameter or larger these objects represent a great potential hazard to life on earth and could cause global destruction nasa is close to accomplishing this goal congress has more recently mandated that by 2020 nasa should detect and track 90 percent of neos that are 140 meters in diameter or larger a category of objects that is generally recognized to represent a very significant threat to life on earth if they strike in or near urban areas achieving this goal may require the building of one or more additional observatories possibly including a space based observatory congress directed nasa to ask the national research council to review nasa s near earth object programs this interim report addresses some of the issues associated with the survey and detection of neos the final report will contain findings and recommendations for survey and detection characterization and mitigation of near earth objects based on an integrated assessment of the problem

## **NASA Technical Paper**

1980

summary evaluations of the performance of laminar flow control lfc leading edge test articles on a nasa



jetstar aircraft are presented statistics presented for the test articles performance in haze and cloud situations as well as in clear air show a significant effect of cloud particle concentrations on the extent of laminar flow the cloud particle environment was monitored by two instruments a cloud particle spectrometer knollenberg probe and a charging patch both instruments are evaluated as diagnostic aids for avoiding laminar flow detrimental particle concentrations in future lfc aircraft operations the data base covers 19 flights in the simulated airline service phase of the nasa leading edge flight test left program davis richard e and maddalon dal v and wagner richard d and fisher david f and young ronald ames research center armstrong flight research center langley research center

## **NASA Technical Memorandum**

1963

southwest research institute swri recently fabricated and delivered the 100 channel ultrasonic phased array testbed system upats for nasa s langley research center nasa prepared the specifications and provided the funding to develop upats in order to provide a tool for the improvement of ultrasonic nondestructive evaluation nde and characterization of materials upats incorporates state of the art phased array concepts such as beam steering focusing apodization and phase sensitive detection which make it possible to develop more sophisticated testing methodologies it also can be used to investigate fundamental ultrasonic propagation and detection phenomena such as refraction diffraction scattering and beam broadening hanley john j and tennis richard f and pickens keith s langley research center nas1 19402 swri proj 17 9891

## NASA Technical Note

1970

we have developed a fast response nanometer aerosol size analyzer nasa that is capable of scanning 30 size channels between 3 and 100 nm in a total time of 3 seconds the analyzer includes a bipolar charger p0210 an extended length nanometer differential mobility analyzer nano dma and an electrometer tsi 3068 this combination of components provides particle size spectra at a scan rate of 0.1 second per channel free of uncertainties caused by response time induced smearing the nasa thus offers a fast response for aerosol size distribution measurements in high concentration conditions and also eliminates the need for applying a de smearing algorithm to resulting data in addition because of its thermodynamically stable means of particle detection the nasa is useful for applications requiring measurements over a broad range of sample pressures and temperatures indeed experimental transfer functions determined for the extended length nano dma using the tandem differential mobility analyzer tdma technique indicate the nasa provides good size resolution at pressures as low as 200 torr also as was demonstrated in tests to characterize the soot emissions from the j85 ge engine of a t38 aircraft the broad dynamic concentration range of the nasa makes it particularly suitable for studies of combustion or particle formation processes further details of the nasa performance as well as results from calibrations laboratory tests and field applications are presented han hee siew and chen da ren and pui david y h and anderson bruce e langley research centeraerosols algorithms combustion physics particle size distribution detection measuring instruments soot emissivity transfer functions stability j 85 engine

electrometers

## **Extraterrestrial Life**

2009-08-14

the activities presented are a broad based approach to advancing key hydrogen related technologies in areas such as hydrogen production distributed sensors for hydrogen leak detection laser instrumentation for hydrogen leak detection and cryogenic transport and storage presented are the results form 15 research projects education and outreach activities system and trade studies and project management the work will aid in advancing the state of the art for several critical technologies related to the implementation of a hydrogen infrastructure activities conducted are relevant to a number of propulsion and power systems for terrestrial aeronautics and aerospace applications anderson tim unspecified center nag3 2930 wbs 581 02 01 03 12

## **NASA SP.**

1981

the search for extraterrestrial intelligence currently being planned by nasa will require that an enormous amount of data be analyzed in real time by special purpose hardware it is expected that overlapped hann data windows will play an important role in this analysis in order to understand the statistical implication of this approach it has been necessary to compute detection statistics for overlapped hann spectra tables of signal detection statistics are given for false alarm rates from  $10 \exp 14$  to  $10 \exp 1$  and signal detection probabilities from 0 50 to 0 99 the

number of computed spectra ranges from 4 to 2000 deans  
stanley r and cullers d kent ames research center rtop  
108 41 60

## ***Near-Earth Object Surveys and Hazard Mitigation Strategies***

2010-01-30

included are four documents that outline the technical aspects of the research performed on nasa grant nag8 140 a system for sequential step detection with application to video image processing leak detection from the ssme using sequential image processing digital image processor specifications for real time ssme leak detection and a color change detection system for video signals with applications to spectral analysis of rocket engine plumes crawford r a and smith l m unspecified center

## **Evaluation of Cloud Detection Instruments and Performance of Laminar-Flow Leading-Edge Test Articles During NASA Leading-Edge Flight-Test Program**

2018-07-06

nasa the national aeronautics and space administration created in the wake of the space act has and continues to accomplish those precepts every day with many hundreds of satellites launched into space and close to 200 human spaceflights nasa is a proven leader in space exploration most of the us space exploration efforts have been led by nasa including the apollo moon landing

missions the skylab space station and later the space shuttle currently nasa is supporting the international space station and is overseeing the development of the orion multi purpose crew vehicle the space launch system and commercial crew vehicles nasa is also responsible for the launch services program which provides oversight of launch operations and countdown management for unmanned nasa launches the historical guide to nasa and the space program contains a chronology an introduction appendixes and an extensive bibliography the dictionary section has over 500 cross referenced entries on space missions astronauts technical terms space shuttles satellites and the international space station this book is an excellent access point for students researchers and anyone wanting to know more about nasa and space exploration

## **Ultrasonic Phased-Array Characterization for Nde Applications**

2018-10-24

to meet the objectives of the vision for space exploration vse nasa must develop a wide array of enabling technologies for this purpose nasa established the exploration technology development program etdp currently etdp has 22 projects underway in the report accompanying the house passed version of the fy2007 appropriations bill the agency was directed to request from the nrc an independent assessment of the etdp this interim report provides an assessment of each of the 22 projects including a quality rating an analysis of how effectively the research is being carried out and the degree to which the research is aligned with the vse to the extent possible the identification and discussion of various cross cutting issues are also presented those issues will be explored and discussed in more

detail in the final report

## **A Nanometer Aerosol Size Analyzer for Rapid Measurement of High-concentration Size Distributions**

2018-08-27

a computer based integrated knowledge based system the intelligent hypertext manual ihm was developed for the space shuttle hazardous gas detection system hgds at nasa marshall space flight center msfc the ihm stores hgds related knowledge and presents it in an interactive and intuitive manner this manual is a combination of hypertext and an expert system which store experts knowledge and experience in hazardous gas detection and analysis the ihm s purpose is to provide hgds personnel with the capabilities of locating applicable documentation related to procedures constraints and previous fault histories assisting in the training of personnel enhancing the interpretation of real time data and recognizing and identifying possible faults in the space shuttle sub systems related to hazardous gas detection lo ching f and shi george z and bangasser carl and fensky connie and cegielski eric and overbey glenn unspecified center nasa cr 194533 nas 1 26 194533 nag8 835

## ***NASA Hydrogen Research for Spaceport and Space Based Applications***

2018-06-15

this research was initiated as a part of the effort at the nasa ames research center to design a computer vision based system that can enhance the safety of

navigation by aiding the pilots in detecting various obstacles on the runway during critical section of the flight such as a landing maneuver the primary goal is the development of algorithms for detection of moving objects from a sequence of images obtained from an on board video camera image regions corresponding to the independently moving objects are segmented from the background by applying constraint filtering on the optical flow computed from the initial few frames of the sequence these detected regions are tracked over subsequent frames using a model based tracking algorithm position and velocity of the moving objects in the world coordinate is estimated using an extended kalman filter the algorithms are tested using the nasa line image sequence with six static trucks and a simulated moving truck and experimental results are described various limitations of the currently implemented version of the above algorithm are identified and possible solutions to build a practical working system are investigated kasturi rangachar and camps octavia and tang yuan liang and devadiga sadashiva and gandhi tarak unspecified center

## Tables of Square-Law Signal Detection Statistics for Hann Spectra with 50 Percent Overlap

2018-10-06

a technique developed and evaluated for the detection and measurement of surface feature interfaces in remotely acquired data is described a computer implementation of this technique has been effected to automatically process categorized data derived from various sources such as the landsat multispectral scanner and other scanner type sensors the basic

elements of the operational theory of the technique are described together with details of the procedure an example application of the technique to the analysis of tidal shoreline length is given with a breakdown of manpower requirements faller k h johnson space center stennis space center nasa tr r 472 jsc s 467 rtop 177 55 89 00 72

## **Ssme Propellant Path Leak Detection Real-Time**

2018-07-10

the spitzer space observatory originally known as the space infrared telescope facility sirtf is the last of the four great observatories which also include the hubble space telescope the chandra x ray observatory and the compton gamma ray observatory developed over twenty years and dubbed the infrared hubble spitzer was launched in the summer of 2003 and has since contributed significantly to our understanding of the universe george rieke played a key role in spitzer and now relates the story of how that observatory was built and launched into space telling the story of this single mission within the context of nasa space science over two turbulent decades he describes how after a tortuous political trail to approval spitzer was started at the peak of nasa s experiment with streamlining and downsizing its mission development process termed faster better cheaper up to its official start and even afterward spitzer was significant not merely in terms of its scientific value but because it stood at the center of major changes in space science policy and politics through interviews with many of the project participants rieke reconstructs the political and managerial process by which space missions are conceived approved and developed he reveals that by the



time spitzer had been completed a number of mission failures had undermined faith in faster better cheaper and a more conservative approach was imposed rieke examines in detail the premises behind faster better cheaper their strengths and weaknesses and their ultimate impact within the context of nasa s continuing search for the best way to build future missions rieke s participant s perspective takes readers inside congress and nasa to trace the progress of missions prior to the excitement of the launch revealing the enormously complex and often disheartening political process that needs to be negotiated he also shares some of the new observations and discoveries made by spitzer in just its first year of operation as the only book devoted to the spitzer mission the last of the great observatories is a story at the nexus of politics and science shedding new light on both spheres as it contemplates the future of mankind s exploration of the universe

## **Historical Guide to NASA and the Space Program**

2016-09-09

this report is a brief summary of the status of work on the grant entitled in situ detection of tropospheric oh ho<sub>2</sub> no<sub>2</sub> and no by laser induced fluorescence in detection chambers at low pressures the first version of the instrument is essentially complete and operational for about six months and we continue to make improvements on the instrument sensitivity and reliability we are focusing our efforts on improving our understanding of the operating characteristics of the instrument particularly the inlet transmission for oh and ho<sub>2</sub> the exact character of the air flow around and within the instrument and the efficiency of the

chemical conversion of ho2 to oh we are also in the process of converting this laboratory instrument into a field worthy instrument that we can take to remote sites for measurements brune william h nasa cr 191916 nas 1 26 191916 nag1 1057

## **Review of NASA's Exploration Technology Development Program**

2008-12-12

this paper presents a summary of the transmission diagnostics research work conducted at nasa lewis research center over the last four years in 1990 the transmission health and usage monitoring research team at nasa lewis conducted a survey to determine the critical needs of the diagnostics community survey results indicated that experimental verification of gear and bearing fault detection methods improved fault detection in planetary systems and damage magnitude assessment and prognostics research were all critical to a highly reliable health and usage monitoring system in response to this a variety of transmission fault detection methods were applied to experimentally obtained fatigue data failure modes of the fatigue data include a variety of gear pitting failures tooth wear tooth fracture and bearing spalling failures overall results indicate that of the gear fault detection techniques no one method can successfully detect all possible failure modes the more successful methods need to be integrated into a single more reliable detection technique a recently developed method na4 in addition to being one of the more successful gear fault detection methods was also found to exhibit damage magnitude estimation capabilities zakajsek james j glenn research center rtop 505 62 36

## **NASA Conference Publication**

1992

the main objective was to demonstrate the potential of using an optical fiber interferometer ofi to detect surface flaws in aluminum samples standard ultrasonic excitation was used to generate rayleigh surface waves after the waves interacted with a defect the modified responses were detected using the ofi and the results were analyzed for time of flight and frequency content to predict the size and location of the flaws gilbert john a unspecified center nasa cr 186180 nas 1 26 186180 nag8 821

## **An Integrated Knowledge System for the Space Shuttle Hazardous Gas Detection System**

2018-08-16

this book describes detection techniques used to search for and analyze gravitational waves gw it covers the whole domain of gw science starting from the theory and ending with the experimental techniques both present and future used to detect them the theoretical sections of the book address the theory of general relativity and of gw followed by the theory of gw detection the various sources of gw are described as well as the methods used to analyse them and to extract their physical parameters it includes an analysis of the consequences of gw observations in terms of astrophysics as well as a description of the different detectors that exist and that are planned for the future with the recent announcement of gw detection and the first results from lisa pathfinder this book will

allow non specialists to understand the present status of the field and the future of gravitational wave science

## **NASA Facts**

1962

the fire prevention detection and suppression fpds project is a technology development effort within the exploration technology development program of the exploration system missions directorate esmd that addresses all aspects of fire safety aboard manned exploration systems the overarching goal for work in the fpds area is to develop technologies that will ensure crew health and safety on exploration missions by reducing the likelihood of a fire or if one does occur minimizing the risk to the crew mission or system this is accomplished by addressing the areas of 1 fire prevention and material flammability 2 fire signatures and detection and 3 fire suppression and response this report describes the outcomes of this project from the formation of the exploration technology development program etdp in october 2005 to september 31 2010 when the exploration technology development program was replaced by the enabling technology development and demonstration program nasa s fire safety work will continue under this new program and will build upon the accomplishments described herein ruff gary a glenn research centerdetection fire prevention fires safety flammability safety management flame retardants fireproofing smoke detectors fire extinguishers nasa programs technology assessment risk assessment

## ***Algorithms for Detection of Objects***

## ***in Image Sequences Captured from an Airborne Imaging System***

2018-07-02

during gfy 91 draper laboratory was awarded a task by nasa jsc under contract number nas9 18426 to study and evaluate the potential for achieving safe autonomous landings on mars using an on board autonomous hazard detection and avoidance ahda system this report describes the results of that study the ahda task had four objectives to demonstrate via a closed loop simulation the ability to autonomously select safe landing sites and the ability to maneuver to the selected site to identify key issues in the development of ahda systems to produce strawman designs for ahda sensors and algorithms and to perform initial trade studies leading to better understanding of the effect of sensor terrain viewing parameters on ahda algorithm performance this report summarizes the progress made during the first year with primary emphasis on describing the tools developed for simulating a closed loop ahda landing some cursory performance evaluation results are also presented pien homer unspecified center

## **A Procedure for Detection and Measurement of Interfaces in Remotely Acquired Data Using a Digital Computer**

2018-08-20

land remote sensing and global environmental change the science of aster and modis is an edited compendium of

contributions dealing with aster and modis satellite sensors aboard nasa s terra and aqua platforms launched as part of the earth observing system fleet in 1999 and 2002 respectively this volume is divided into six sections the first three sections provide insights into the history philosophy and evolution of the eos aster and modis instrument designs and calibration mechanisms and the data systems components used to manage and provide the science data and derived products the latter three sections exclusively deal with aster and modis data products and their applications and the future of these two classes of remotely sensed observations

## **The Last of the Great Observatories**

2006-05-11

safety assessment of new air traffic management systems is a main issue for civil aviation authorities standard techniques such as testing and simulation have serious limitations in new systems that are significantly more autonomous than the older ones this paper presents an innovative approach based on formal verification for establishing the correctness of conflict detection systems fundamental is the concept of trajectory which is a continuous path in the x y plane constrained by physical laws and operational requirements from the model of trajectories the authors extract and formally prove high level properties that can serve as a framework to analyze conflict scenarios they use the ails alerting algorithm as a case study

## **NASA Space Systems Technology Model**

1984

**In Situ Detection of Tropospheric Oh,  
Ho2, No2, and No by Laser-Induced  
Fluorescence in Detection Chambers at  
Reduced Pressures**

2018-12-29

***NASA Contractor Report***

1981

**A Review of Transmission Diagnostics  
Research at NASA Lewis Research  
Center**

2018-10-23

***NASA Technical Translation***

1959

***Scientific and Technical Aerospace  
Reports***

1967

## **Development of an Optical Fiber Interferometer for Detection of Surface Flaws in Aluminum**

2018-08-16

## ***Overview Of Gravitational Waves, An: Theory, Sources And Detection***

2017-02-15

## **Final Report: Fire Prevention, Detection, and Suppression Project, Exploration Technology Development Program**

2018-05-22

## **Autonomous Hazard Detection and Avoidance**

2018-10-27

## **Geolocation assessment algorithm for CALIPSO using coastline detection**

2010-12-14



**Advanced atmospheric water vapor DIAL  
detection system**

2001

**Land Remote Sensing and Global  
Environmental Change**

1978

**On the Formal Verification of  
Conflict Detection Algorithms**

***Reliable Dual-redundant Sensor  
Failure Detection and Identification  
for the NASA F-8 DFBW Aircraft***

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