Design Engineering

Papers Presented at the AIAA Aviation Forum 2021

Online 2 – 6 August 2021

ISBN: 978-1-7138-4359-7

Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

The contents of this work are copyrighted and additional reproduction in whole or in part are expressly prohibited without the prior written permission of the Publisher or copyright holder. The resale of the entire proceeding as received from CURRAN is permitted.

For reprint permission, please contact AIAA's Business Manager, Technical Papers. Contact by phone at 703-264-7500; fax at 703-264-7551 or by mail at 34922 Uwptkug'Xcmg{'Ftkxg."Uwkg'422, Reston, VA 20191, USA.

TABLE OF CONTENTS

MODEL BASED DESIGN APPLIED TO COMPLEX CABIN SYSTEM
EXPERIENCE OF CONCEPTUAL DESIGNS AND SYSTEM INTERACTIONS FOR THE AIRCRAFT CABIN IN VIRTUAL REALITY
EVALUATING VR PRACTICES TO SUPPORT COLLABORATIVE CABIN DESIGN PROCESS USING A HUMAN FACTOR APPROACH
HIGH FIDELITY DIGITAL CABIN MOCK-UP BASED ON PRELIMINARY AIRCRAFT DESIGN DATA FOR VIRTUAL REALITY APPLICATIONS AND BEYOND
INTEGRATION OF MULTI-PHYSICS ANALYSIS INTO THE CABIN DESIGN PROCESS USING VIRTUAL REALITY
EMERGING DESIGN TOOLS AND INNOVATIVE APPROACHES I
A CHALLENGE TO THE FINITE ELEMENT ANALYSIS COMMUNITY: WHAT IS THE NEXT ADVANCE FORTHCOMING IN ENGINEERING?
BEST OF BOTH WORLDS: USING EXPLAINABLE AI AND MODEL-BASED SYSTEM ENGINEERING TO DESIGN FLIGHT GUIDANCE AND CONTROL SYSTEMS
2D MIXED-COMPRESSION INLET SIZING OF SUPERSONIC VEHICLES
EMERGING DESIGN TOOLS AND INNOVATIVE APPROACHES II
INITIAL SAMPLE COLLECTION DEVICE FOR MICROGRAVITY CHALLENGE
AMPHIBIOUS BIOINSPIRED ROBOTS FOR OCEAN OBJECTS IDENTIFICATION
APPLICATION AND POTENTIAL DESIGN OF AN AMPHIBIOUS DRONE HUB: WATER LILY AND BIOINSPIRATION CONCEPTS
BIOINSPIRED ROBOT WITH WALKING, ROLLING, AND JUMPING CAPABILITIES FOR PLANETARY EXPLORATION

INNOVATIVE of	& CREATIVE	DESIGNS IN	AEROSPACE	AND	OTHER A	REAS
---------------	------------	------------	------------------	------------	---------	------

PLANAR STRAIN-RELIEF MECHANISMS FOR SPACE-BASED PHASED ARRAY ANTENNA INTERFACES
Nathan A. Pehrson, Benjamin Urioste, Samuel P. Smith, Steven Lockyer, Christopher Solis, Loren Telles
DESIGN AND PROTOTYPING SYSTEM FOR A SOLE MORPHING ASTRONAUT BOOTS
CONCEPTUAL DESIGN OF MARS OCTASTRUT LANDER FOR LARGE SCALE MASS LANDING
Malaya Kumar Biswal M, Ramesh Naidu Annavarapu
DESIGN OF MARS UNDERGROUND HABITAT FOR HUMAN SETTLEMENT ON MARS
KNOWLEDGE-BASED ENGINEERING
A KNOWLEDGE-BASED METHODOLOGY FOR THE INITIATION OF MILITARY AIRCRAFT CONFIGURATIONS
DEVELOPMENT OF A HYPERSONIC VEHICLE CONFIGURATION COMPENDIUM

Author Index