## Propulsion and Power Systems of Unmanned Systems

Papers Presented at the AIAA Propulsion and Energy Forum 2021

Online

9 - 11 August 2021

ISBN: 978-1-7138-4349-8

## 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

<u>UNMANNED AIRCRAFT SYSTEMS I</u>	
ENERGY SYSTEM INSTRUMENTATION AND DATA ACQUISITION FOR FLIGHT TESTING A LONG-ENDURANCE, SOLAR-POWERED UNMANNED AIRCRAFT	•••••••••••••••••••••••••••••••••••••••
EXPERIMENTAL STUDY OF 5-KW, 7-KW, AND 13-KW UNMANNED AIRCRAFT TURBOELECTRIC POWER SYSTEMS	13
DESIGN AND PERFORMANCE OF A 100+ KW HYBRID-ELECTRIC POWER GENERATION TESTBED	22
A REAL-TIME COMPUTING PLATFORM FOR UAS SYSTEM DYNAMICS AND CONTROL SIMULATION	35
UNMANNED AIRCRAFT SYSTEMS II	
DESIGN STUDY AND VALIDATION OF MARS UNDERGROUND HABITAT FOR HUMAN SETTLEMENT ON MARS	48
INTEGRATION OF A 7-KW TURBOELECTRIC POWER SYSTEM IN A VERTICAL TAKE- OFF AND LANDING UNMANNED AIRCRAFT	58
AERO-ELECTRIC EVALUATION OF PIEZOELECTRIC MATERIALS ON SMALL MONITORING UAVS	67
Esteban A. Valencia, Denisse Leines, Mathiu Berrazueta, Henry Lema, Marcelo Pozo  OPTIMIZATION OF HIGH PAYLOAD UNMANNED AERIAL VEHICLE'S PROPELLERS  PAGED ON ENERGY FORMATION BY USING COMPUTATIONAL WIPP ATTOMAL	
BASED ON ENERGY FORMATION BY USING COMPUTATIONAL VIBRATIONAL ANALYSES	80
UNMANNED AIRCRAFT SYSTEMS III	
A HYBRID VEHICLE SYSTEM FOR DEPOSITING PAYLOADS IN EXTREME ENVIRONMENTS LIKE ANTARCTICA AND ARCTIC	110
DESIGN OF HALE PROPELLER THROUGH MULTI-OBJECTIVE OPTIMIZATION  Jelena Svorcan, Mohammad Sakib Hasan, Aleksandar Kovacevic, Toni Ivanov	120

RESEARCH ON AERODYNAMIC AND HYDRODYNAMIC PERFORMANCE AND	
EXITING WATER PROCESS OF A MORPHING AQUAUAV	133
Rui Yao, Xu Zhao, Qian Wang, Yutong Zheng, Hongyan Li	
COMPARATIVE ESTIMATIONS OF HYDRODYNAMIC ANALYSIS ON UNMANNED	
AQUATIC VEHICLE'S PROPELLER BY USING AN ADVANCED [CFD WITH MRF]	
APPROACH	143
Vijayanandh Raja, Arul Prakash Raji, Senthil Kumar Madasamy, Vijayakumar Mathaiyan,	
Sundararaj Kandasamy, Indira Prasanth Subramaniam, Kesavan Kandasamy, Ramesh	
Murugesan, Rajkumar Rajapandi, Darshan Kumar Jayaram, Naveen Kumar	
Kulandaiyaappan, Raj K. Gnanasekaran	

## **Author Index**