REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. **PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.**

1. REPORT DATE *(DD-MM-YYYY)*
09-06-2021

2. REPORT TYPE
Technical Paper

3. DATES COVERED *(From - To)*
9/2020 – 5/2021

4. TITLE AND SUBTITLE

Safe and Efficient Flight Test Execution through Digital Engineering: High-Fidelity Loads Regression Prediction Generation

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Victor Luquin
Alyssa Lai
Alden Latkin
Wendy Hashii

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) AND ADDRESS(ES)

773 TS/ENFS
307 E Popson Ave
Edwards AFB, CA 93524

8. PERFORMING ORGANIZATION REPORT NUMBER
412TW-PA-21326

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
412th Test Wing
195 E Popson Ave
Edwards AFB CA 93524

10. SPONSOR/MONITOR'S ACRONYM(S)
N/A

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for public release Distribution Statement A: distribution is unlimited.

13. SUPPLEMENTARY NOTES
Source Code 012100 (This number comes from STINFO via EAFB Technical Library)
CA: 412th Test Wing, Edwards AFB, CA

14. ABSTRACT

Analytical computer models provide initial external aircraft loads predictions at the start of a loads program, however, these predictions are typically not updated as flight test progresses, even when large deviations between measured and predicted loads are observed. External aircraft loads predictions generated with a multiple linear regression with interactions technique can provide continuously updated high-fidelity empirical predictions by using the readily available aircraft states, rates, and surface positions as predictors. Continuously updated, high-fidelity loads predictions will significantly increase both the test efficiency and safety of a loads flight test program.

15. SUBJECT TERMS
USAF TPS, Stanford GPS Lab, ARAIM, DPA, GNSS, Flight Test, C-12J

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
					412 TENG/EN (Tech Pubs)
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**	None	19	**19b. TELEPHONE NUMBER** *(include area code)*
Unclassified	Unclassified	Unclassified			661-277-8615

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18