UNCLASSIFIED DTIC FILE COPY

(2)

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY LE	3. DISTRIBUTION / AVAILABILITY OF REPORT Unlimited
AD-A196 593 R(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S) AFOSR-TR- 88-0542 AFOSR-86-0247

6a. NAME OF PERFORMING ORGANIZATION Electronics Research Lab.	6b. OFFICE SYMBOL (If applicable)
6c. ADDRESS (City, State, and ZIP Code) University of California Berkeley, CA 94720	7a. NAME OF MONITORING ORGANIZATION Air Force Office of Scientific Research
	7b. ADDRESS (City, State, and ZIP Code) Bldg. 410, Bolling Air Force Base Washington, DC 20332
8a. NAME OF FUNDING / SPONSORING ORGANIZATION AFOSR	8b. OFFICE SYMBOL (If applicable) NM
8c. ADDRESS (City, State, and ZIP Code) Bldg 410, Bolling Air Force Base Washington, DC 20332	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER AFOSR-86-0247

10. SOURCE OF FUNDING NUMBERS			
PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.
61102F	2917	A5	

11. TITLE (Include Security Classification)

Optimization-Based Design of Control Systems

12. PERSONAL AUTHOR(S)

E. Polak

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final Report	FROM 7/31/86 TO 7/30/87	4/13/88	2

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

(i) A DEC MicroVax II GPX Color workstation has been acquired for experimentation with the DELIGHT.MIMO interactive software system in the solution of optimal, worst case design of multivariable control systems. (ii) A SUN workstation - based system has been expanded for experiments in distributed computing for the optimal, integrated design of flexible structures and their control systems.

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION
22a. NAME OF RESPONSIBLE INDIVIDUAL JAMES M CROWLEY, Maj, USAF	22b. TELEPHONE (Include Area Code) (202) 767-5025
	22c. OFFICE SYMBOL AFOSR/NM

DD Form 1473, JUN 86 — Previous editions are obsolete. — SECURITY CLASSIFICATION OF THIS PAGE

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OPTIMIZATION-BASED DESIGN OF CONTROL SYSTEMS

Final Technical Report
AFOSR Grant 86-0247
(July 31, 1986 — July 30, 1987)

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FINAL REPORT FOR AFOSR EQUIPMENT GRANT No. 86-0247 (22521)

ABSTRACT (i) A DEC MicroVax II GPX Color workstation has been acquired for experimentation with the DELIGHT.MIMO interactive software system in the solution of optimal, worst case design of multivariable control systems. (ii) A SUN workstation - based system has been expanded for experiments in distributed computing for the optimal, integrated design of flexible structures and their control systems.

INTRODUCTION As part of our research on optimization-based design of multivariable control systems (sponsored by ONR) and on the optimization-based, integrated design of large space structures and their control systems (sponsored by AFOSR), we are carrying out research on the development of interactive software systems for the implementation of the design techniques we are producing. In particular, (i) we are developing DELIGHT.MIMO, an interactive computing system for the optimal, worst case design of multivariable control systems, and (ii) we are beginning to architect a distributed computing system, consisting of a work station for user-machine interaction and a large frame computer for system response simulation, for the design of flexible structures and their control systems.

SUMMARY OF EQUIPMENT USE

(i) The DEC MicroVax II GPX Color workstation is being used to implement DELIGHT.MIMO in an X-Windows environment.

(i) The power and versatility of our fileserver-based SUN workstation system has been upgraded from SUN2 to SUN3 format and expanded by the addition of the following items:

1. One SUN 2 Upgrade, incl. 2/160-2 workstation & Floating Point Unit,
2. One SUN 3/140, 4MB workstation,
3. One SUN X511A "Shoebox" Disk/Tape Unit,
4. One Sun X960A Rack,
5. One Fujitsu Eagle Disk Drive,
6. One Apple Laserwriter Printer.

As a result of these additions, all the students and faculty participating in the project now have individual access to a workstations, which has considerably increased the productivity of our experimental work. Our skill in using workstations productively is also being considerable expanded, to the extent that plans for distributed computing, optimal design system experiments, involving flexible structures

and their control systems, are now beginning to be implemented, in collaboration with researchers at NASA Langley Research Center. Furthermore, the additions are enabling us to implement DELIGHT.MIMO in several several graphical environments, which increases its portability and ease of transferring it to industry.