LEVEL ⑬ CSU

AFOSR-TR- 81-0808

Department of Mathematics
303/491-6326

FINAL SCIENTIFIC REPORT

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DEC 3 0 1981
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AD A109126

U. S. Air Force
Contract F-49620-79-C-0124
DATA FITTING
1 July 1979 - 30 September 1981
Principal Investigator: G. D. Taylor

During the above period the following articles written with grant support
have been published or accepted for publication:

1. "Continuity of best reciprocal approximation on $[0, \infty)$", J.Approx.Theory, 30 (1980), 71-79 (co-authored with C. Dunham).

2. "Uniform approximation by rational functions having restricted denominators", accepted J.Approx.Theory (co-authored with E. Kaufman).

3. "On the existence of strong unicity of arbitrarily small order", Approximation Theory III, E.W.Cheney, ed., Academic Press, 1980, pgs 293-298 (co-authored with B.L.Chalmers).

4. "Uniform rational approximation by differential correction and Remes-differential correction", Int.J.for Numer.Meth.in Eng., 17 (1981), 1273-1280 (co-authored with E.Kaufman and D.Leeming).

5. "Copositive Rational Approximation", accepted J.Approx.Theory (co-authored with N.Seif).

The following manuscripts written with grant support have been submitted to technical journals for publication:

1. "A unified theory of strong uniqueness in uniform approximation with constraints", submitted to J.Approx.Theory (co-authored with B.L.Chalmers).

2. "Strong unicity of arbitrary rate", submitted to J.Approx.Theory (co-authored with B.Chalmers and F.Metcalf).

3. "An adaptive differential correction algorithm", submitted to J.Approx. Theory (co-authored with E.Kaufman and S.McCormick).

The following manuscripts representing research partially supported are currently being prepared for submission to technical journals:

1. "Reciprocal polynomial approximation subject to linear constraints", in preparation (with B.Chalmers, E.Kaufman, D.Leeming).

2. "Reciprocal polynomial approximation on $[0, \infty)$ with nonnegative coefficients", in preparation (with E.Kaufman and D.Leeming).

The following research projects receiving partial support have been completed.

1. Numerical testing of the uniform and restricted range adaptive curve fitting packages, M.S. Thesis, Colorado State University, Spring, 1980, written by James A. Pastoor, directed by Professor Taylor. Mr. Pastoor is currently employed at Hughes Aircraft Corporation, Denver.

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2.   Numerical study of the sensitivity of the ℓ_1-ℓ_2 adaptive curve fitting
     package, M.S. Thesis, Colorado State University, Spring, 1980, written
     by Jane E. Pastoor, directed by Professor Taylor. Mrs. Pastoor is
     currently employed at Hughes Aircraft Corporation, Denver.

3.   Numerical testing of a curve-fitting package utilizing cubic splines,
     M.S. Thesis, Colorado State University, Summer, 1980, written by
     Roberta C. N. Okada, directed by Professor Taylor. Miss Okada is
     currently employed at Lockheed Aircraft Corporation, Sunnyvale,
     California.

4.   An adaptive piecewise curve-fitting package using a look-ahead strategy,
     M.S. Thesis, Colorado State University, Spring, 1981, written by David
     C. Platt, directed by Professor Taylor. Mr. Platt is currently employed
     by Martin-Marietta Corporation, Denver, Colorado.

5.   An adaptive application of a shape-preserving spline curve fitting routine,
     M.S. Thesis, Colorado State University, Summer, 1981, written by
     Chung-Chie George Chow, directed by Professor Taylor. Mr. Chow is
     currently employed by a small seismographic software company in Dallas,
     Texas.

The following two projects that received partial support from this contract
are now being brought to completion:

1.   Data fitting: a survey of existing data sets in the general literature.
     This will be the topic of a M.S. Thesis paper written by Eileen Fritz.

2.   An adaptive application of a monotone preserving cubic spline package.
     This will be the topic of a M.S. Thesis paper written by Judy Lee.

                              Gerald D. Taylor,
                              Principal Investigator
                              .F-49620-79-C-0124

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1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
AFOSR-TR- 8 ⊥ -0808	AD A109126	

4. TITLE (and Subtitle)	5. TYPE OF REPORT & PERIOD COVERED
FINAL SCIENTIFIC REPORT F49620-79-C-0124	FINAL, 1 JUL 79 – 30 SEP 81
	6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)	8. CONTRACT OR GRANT NUMBER(s)
Gerald D. Taylor	F49620-79-C-0124

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
Department of Mathematics Colorado State University Fort Collings CO 80523	PE61102F, 2304A3

11. CONTROLLING OFFICE NAME AND ADDRESS	12. REPORT DATE
Directorate of Mathematical & Information Sciences	SEP 1981
Air Force Office of Scientific Research	13. NUMBER OF PAGES
Bolling AFB DC 20332	2

14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)	15. SECURITY CLASS. (of this report)
	UNCLASSIFIED
	15a. DECLASSIFICATION DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Distribution unlimited: approved for public release.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

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

This report lists articles written under support of the contract, which have
been published or accepted for publication, manuscripts submitted to technical
journals for publication, manuscripts currently being prepared for submission
to technical journals, and research projects which received partial support.
and have been completed.