RESEARCH IN APPLIED MATHEMATICS RELATED TO NONLINEAR SYSTEM THEORY

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DAAG29 81 K 0136

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NA

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mathematical system theory  nonlinear realization theory
linear systems  applied algebraic geometry

Please see summary.
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U. S. Army Research Office
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10 August 1981 through 9 August 1984

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1. BRIEF SUMMARY OF ACTIVITIES UNDER GRANT

During many years in the past, funds from this grant were used primarily to support postdoctoral research at the Center for Mathematical System Theory at the University of Florida. During the period covered by this report, the following postdoctorals were involved:

   J. HAMMER (1980 to 1982)
   J. C. BIRGET (1983 to 1985)

Such support is limited to two years but is usually less.

In addition, several predoctoral students were also supported, albeit on a much lower financial level. This list includes A. OZGULER, P. KHARGONEKAR, J. RIBERA, and T. GEORGIOU. Also supported was the Principal Investigator (partial summer support only) and various short-term visitors (research "consultants") who lectured on their recent work directly relevant to Center research.

A complete list is given in Section 3.

During the present three-year period of the grant, the number of publications was quite large, compared to earlier periods. This was not due to a large increase of personnel, but simply to the fact that publications are subject to a long lag. Moreover, in any serious research program, several years may be necessary before the problems become clearly defined, but then the results come relatively quickly.

A number of external publications (for example, by ROUCHALEAU, HAZEWINKEL, and KAMEN) have been strongly influenced by the Center. These are not included in the list in Section 2 which is limited to work that actually carried acknowledgement to the Army Grant to which this report pertain. Even a cursory look at the system-theoretic literature, however, will show that the influence of the Center research went far beyond the works listed in this report.
Since its establishment in 1972, research at the Center for Mathematical System Theory has generated over 100 published papers. At the same time, the Center has served as a focal point for a considerable part of the system-theoretic research in the U. S. and elsewhere, through an active visitor program and through recruitment of outstanding doctoral students. This is especially true for the development and application of advanced algebraic and algebraic-geometric techniques in the system-theoretic context.

The Center is an interdisciplinary, interdepartmental group, a basic function of which is to provide coordination and collaboration between advanced mathematics and engineering. This is critical for a research program of this type. Direct interaction between persons of different but overlapping backgrounds is important not only in optimizing the chances of success in research but also in assuring that the results will be disseminated to wider engineering circles and facilitating subsequent practical utilization.

The national and international recognition achieved by the Center reflects a vigorous and effective research organization. We expect to fully continue the strong research activities at the Center in the future.
2. PUBLICATIONS SPONSORED BY THE GRANT

G. BASILE and F. HAMANO


J. C. BIRGET


J. C. BIRGET and J. RHODES


E. EMRE


E. EMRE and P. P. KHARGONEKAR


E. EMRE, P. P. KHARGONEKAR, and A.B. OZGULER


E. EMRE, A. B. OZGULER and P. P. KHARGONEKAR

T. T. GEORGIOU


T. T. GEORGIOU and P. P. KHARGONEKAR


F. HAMANO and G. BASILE


J. HAMMER


J. HAMMER and M. HEYMANN


J. HAMMER and P. P. KHARGONEKAR


R. E. KALMAN


E. W. KAMEN and P. P. KHARGONEKAR


E. W. KAMEN, P. P. KHARGONEKAR, and A. TANNENBAUM


P. P. KHARGONEKAR


P. P. KHARGONEKAR and E. EMRE

P. P. KHARGONEKAR, T. T. GEORGIOU, and A. B. OZGULER


P. P. KHARGONEKAR and A. B. OZGULER


P. P. KHARGONEKAR and E. D. SONTAG


P. P. KHARGONEKAR and A. TANNENBAUM


A. B. OZGULER


J. RIBERA

A. TANNENBAUM

[1982] "Polynomial rings over arbitrary fields in two or more variables are not pole assignable", 6 pages, to appear in Systems and Control Letters.


A. TANNENBAUM and P. P. KHARGONEKAR


Y. YAMAMOTO


3. PERSONNEL SUPPORTED UNDER THE GRANT

(a) Regular Personnel

Professor R. E. Kalman, Principal Investigator (partial summer support only).

Dr. J. C. Birget, postdoctoral fellow (1983-1985) (now on faculty of University of Nebraska)

Dr. T. Georgiou, doctoral student (now on faculty of Florida Atlantic University)

Dr. J. Hammer, postdoctoral fellow (now on faculty of Case Western Reserve University)

Dr. P. P. Khargonekar, doctoral student (now on faculty of University of Minnesota)

Dr. A. B. Ozguler, doctoral student (now on faculty of Marmara Scientific and Industrial Research Institute, Kocaeli, TURKEY)

Dr. J. Ribera, doctoral student (now on faculty of I. E. S. E., Barcelona, SPAIN)

Dr. A. Tannenbaum, Visiting Professor (partial summer support only, now on faculty of McGill University, Montreal, CANADA)

(b) Visitors (several lectures and/or extended visits)

B. W. Dickinson, Princeton University, Princeton, NJ
R. Donagi, Harvard University, Cambridge, MA
D. Findley, US Department of Commerce, Washington, DC
P. A. Fuhrmann, University of the Negev, Beer Sheba, ISRAEL
R. P. Guidorzi, Bologna University, ITALY
H. Kimura, Osaka University, JAPAN
S. Y. Kung, University of Southern California, Los Angeles
E. B. Lee, University of Minnesota, Minneapolis, MN
N. A. Lehtomaki, Honeywell Systems and Research, Minneapolis, MN
A. Libgober, University of Illinois, Chicago, IL
G. Marro, University of Bologna, ITALY
T. Matsuo, Nagoya University, JAPAN
J. L. Rhodes, University of California, Berkeley, CA
J. D. Sargan, London School of Economics, ENGLAND
E. D. Sontag, Rutgers University, New Brunswick, NJ
G. C. Verghese, MIT, Cambridge, MA
Y. Yamamoto, Kyoto University, JAPAN
G. Zames, McGill University, CANADA
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