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Falb P L & Wolovich W A. Decoupling in the design and synthesis of multivariable control systems. *IEEE Trans. Automat. Contr.* **AC-12**:651-9, 1967.
[Div. Applied Mathematics, Brown Univ., Providence, RI and NASA Electronics Research Center, Cambridge, MA]

Necessary and sufficient conditions for the "decoupling" of a time-invariant linear system using state feedback are determined. Given a system that can be decoupled, the class of feedbacks that decouple the system is characterized. The results are applied to pole placement and synthesis. [The *SCI*® indicates that this paper has been cited in over 175 publications since 1967.]

Peter L. Falb
Division of Applied Mathematics
Brown University
Providence, RI 02912

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The development of techniques for the design of control systems using feedback is of considerable practical importance. In particular, it is desirable to know whether or not it is possible to have inputs control outputs independently, i.e., a single input influences a single output. The publication has been cited so frequently because it provides a complete solution to this "decoupling" problem. In addition, the solution provided considerable impetus to future work by demonstrating that a neat, computable solution to an important problem could be obtained. Earlier results were fragmentary and special, and involved essentially trial and error procedures.[1,2] The results in the publication were mathematically precise and constructive. As such, they represented a sound blending of mathematics and engineering.

The work took place while I was consulting for the Office of Control Theory and Applications (OCTA) at the NASA Electronics Research Center. Bill Wolovich was a staff member there. He later received his doctorate at Brown University under my supervision and is now a professor of engineering at Brown. OCTA was a vital and active center for work in control during the period 1965-1970. There were a number of consultants, and many of the staff members followed a path similar to Bill's to become active (and well-known) people in the control field. The atmosphere at OCTA was very conducive to research and, in particular, to cooperation among individuals with differing backgrounds and skills. This paper represents an example of such cooperation. Bill was an engineer with a fine intuition but at that time had very limited mathematical knowledge or sense of rigorous thinking. I was a mathematician with very limited engineering intuition. Our joint effort, which was thoroughly encouraged by the OCTA environment, was an example of the best type of interdisciplinary cooperation. It was a shame that the politicians put an end to such efforts by closing the Electronics Research Center.

One sore point regarding the paper was, in my opinion, the rather poor quality of the reviews. The revisions required were essentially nonsubstantive—being mainly of the "you didn't refer to me enough" variety. This type of reviewer approach is all too frequent in the control and systems field. The problems in control and systems science and engineering are both theoretically significant and practically relevant. It is unfortunate that small-minded and petty reviewing detracts from the quality of the field. Nonetheless, as the frequency of citation of the paper demonstrates, work of value will make its mark.

To end on a positive note, the key to the paper's success is, perhaps, more than anything else the fun and excitement Bill and I had in doing the work.

1. **Morgan B S.** The synthesis of linear multivariable systems by state variable feedback. *IEEE Trans. Automat. Contr.* **AC-9**:405-11, 1964.
2. **Rekasius Z V.** Decoupling of multivariable systems by means of state variable feedback. (Van Valkenburg M E, ed.) *Proceedings of the 3rd Annual Allerton Conference on Circuit and System Theory.* Urbana, IL: University of Illinois, 1965. p. 439-47.

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