

Linear Multivariable Control. Methods & Philosophy of the Algebraic Approach

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Abstract

In this plenary talk we look at what we believe to have been the cornerstones behind the methods and the philosophy in the development of the *Algebraic Approach* to Linear Multivariable Control System analysis and synthesis methods.

We examine briefly some key concepts and results developed during the last 40 years mainly through the research efforts of three individuals who, we believe, laid the foundations of a very active research area which is known in the control literature as the “*polynomial equation or polynomial matrix approach*”.

It is our thesis that the main figures that shaped this area of research and deeply influenced the key developments in the field and the research efforts of many workers including ours, are in order our personal scientific development: Prof. H. H. Rosenbrock, FRS, Head during the seventies of the Control Systems Centre at the University of Manchester Institute of Science and Technology (UMIST), U.K., Prof. W. A. Wolovich, at the Division of Engineering of Brown University, U.S.A and Prof. Ing. Vladimir Kucera, Faculty of Electrical Engineering, Czech Technical University in Prague and Head of the Center for Applied Cybernetics, Czech Technical University in Prague.

We will try to show that there is a common ground among key concepts, ideas and results found in the work of these pioneers and of many other whose work was influenced by them, and some very old questions and answers posed for the first time in recorded history some 2500 years ago in these parts of the world and comprising what is nowadays known as the *Euclidean algorithm*.