Travel for persons and transportation for loads are activities that have been pursued by the human race since the beginnings of the long climb from primitive origins. Means with strength and power to move cargo have always been necessary but never, by themselves, adequate for delivering items to chosen locations. Useful overall results have required, as an additional factor, ability for the generation and use of sensed information to realize effective control and direction for the entities of strength. With one notable exception, components of strength have lacked the general ability to sense, process, and apply information for carrying out successful missions. The exception is that of human beings whose bones and muscles may carry loads while their bodies include nervous systems, sensors, and brains that give them unique capabilities for acquiring and using information to provide control and direction.

Charles Stark Draper,
"Control, navigation, and guidance,"
IEEE Control Systems Magazine,
vol. 1, no. 4, p. 4, Dec. 1981

Dr. George C. Newton, Jr., 61, a professor at the Massachusetts Institute of Technology for 34 years and widely respected for his teaching and research concerned with servomechanisms, radar, and digital systems, died April 16, 1981...

[He] was the author of 27 technical articles and coauthor (with L. A. Gould and J. F. Kaiser) of a highly recognized textbook, *Analytical Design of Linear Feedback Controls*, published in 1957... This body of work is a landmark in feedback control theory. It represents the first workable approach to the treatment of the control problem as one of constrained optimization and stands as the basis for what is now called Linear, Quadratic, Optimal Control. Before Newton, early approaches to control system design were trial-and-error methods. N. Wiener and A. C. Hall were among the first to use analytical methods for control system design during World War II. However, Professor Newton was the first to recognize the differences between filter design (which was the main thrust of Wiener's work) and feedback control system design... Of primary importance was his introduction of saturation constraints into control system analysis and design and his formulation of the bandwidth minimization problem as a way to minimize the cost of the control system...

What followed Newton's work is now the main stream of Modem Control Theory. The key step was taken by Kalman who worked in the Servomechanisms Laboratory at M.I.T. shortly after Newton's papers appeared in the literature. By introducing the state-space representation of linear systems, Kalman reformulated the Wiener-Lee filter problem. This led to the Kalman-Bucy filter which could be implemented directly on a computer because of its recursive behavior. Moreover, Kalman also stated the linear, quadratic optimal control problem which he solved. Combining these two problems yields the linear, quadratic, Gaussian (LQG) control problem which is the basis for much of modern control system design. It is clear that the linear, quadratic, Gaussian control problem is a direct generalization of Professor Newton's work... Although many of the theoretical developments that have followed Newton's work may appear somewhat academic, the basic philosophical setting is very practical and realistic and is primarily due to Professor Newton.

"Obituary—Professor Newton"
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