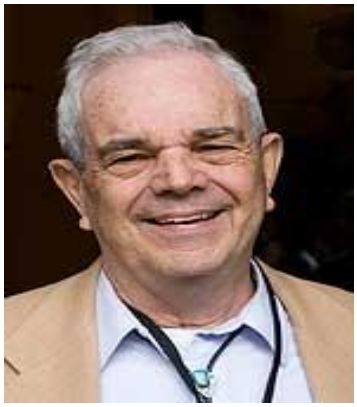
MEDALIST FOR 2009

For a lifetime of seminal contributions to real systems, creating and applying practical optimal control and estimation techniques to airplanes, rotorcraft, and missiles.



ARTHUR BRYSON

After receiving his B.S. in Aeronautical Engineering from Iowa State University in 1946, Bryson worked as a paper mill engineer with the Container corp. of America and in 1948 as a wind tunnel engineer in the Research Department of the United Aircraft Corp. before earning a Ph.D. at the California Institute of Technology. His thesis *An Interferometric Wind Tunnel Study of Transonic Flow past Wedge and Circular Arcs* was advised by Hans W. Liepmann.

Bryson's first employment after earning his Ph.D. was from 1950-1953 at the Hughes Aircraft Company, where he made many of his contributions to the controls field. One of his early accomplishments was the prediction based on optimal calculations that the fastest way for a supersonic airplane to climb to altitude was to first dive through Mach 1. This established that optimal control was the real tool that could be used to solve real problems.

In 1953 he became assistant professor in Mechanical Engineering at Harvard University followed by full professor in 1961. His field of interest was in fluid mechanics and optimal control. Bryson joined Stanford University in 1968 with a joint appointment with the Applied Mechanics and Aeronautics and Astronautics Departments, chairing the Applied Mechanical Department from 1968-1971 and the Aeronautics and Astronautics Department from 1971 to 1979. His field of interest at Sanford was optimal control, primarily applied to linear problems. In 1969 he (with Y. C. Ho) wrote "Applied Optimal Control," a reference book that was used extensively by practicing engineers and students. He was appointed the Paul Piggott Professor in 1972, becoming Emeritus in 1993.

During his academic career, he was a consultant to several aerospace companies, including Hughes and Raytheon. After retiring in 1993, he wrote two more books on applied optimal control methods, primarily applied to aerospace problems that captured his practical experiences as a faculty member and consultant to industry over his career.

Bryson had enormous impact as an educator. He and his students helped introduce the concepts to practical problems and developed improvements as well. Several of his students developed practical control systems algorithms that are extensive use today. A few commercial

software companies were influenced by Bryson's students and designed control systems software packages, making it routine for practicing engineers in many fields to determine optimal control solutions for their product designs. Later in his career Bryson had several students who applied optimal control methods to helicopters that included applications of the methods to helicopter flight tests at the NASA Ames Research center.

Bryon's applications of optimal control over the decades have been applied to airplanes, guided missiles, and helicopters. Modern guided missile control algorithms are still primarily based on the work done by him as a consultant back in the 1960s. There can be no doubt that Bryson's entire career has been focused on applying optimal control techniques that have made a substantial difference in real world applications.