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OBITUARY

The Polish and international community of control theorists suffered a painful loss. Dr. **Andrzej W. Olbrot**, Professor of Electrical and Computer Engineering at Wayne State University, died tragically on Thursday, December 10, 1998 in Detroit. He was shot and killed in a classroom by a student who had failed a part of the Ph.D. qualifying exam.

Professor Olbrot was one of the most prominent representatives of the Polish school of control theory. He was a well known expert in the areas of robust control and systems with time-delay. He has authored or co-authored more than 100 refereed journal and conference papers and many of his papers contain seminal results, which are frequently quoted.

Andrzej Olbrot was born in Lisów (Poland) on April 6, 1946. He obtained all his degrees at Warsaw University of Technology ('*Politechnika*') in Poland: M.Sc. in Electronic Engineering in 1970, Ph.D. in 1973 and Habilitation in 1977. He became a faculty member at the Institute of Automatic Control of the Warsaw *Politechnika*, whose director at the time was Professor Władysław Findeisen.

During the early stages of his career, while in Warsaw, he advanced the controllability theory for systems with input delays and obtained verifiable criteria of degeneracy of delay-differential equations. In 1973 he solved the long-standing problem of null-controllability of linear delay-differential systems. He developed several characterizations of function space controllability for such systems. In 1977 he and S. Kurcyusz published a paper that gave the first explicit characterization of the closure property for the reachable subspace of delay systems. In the same year, he and A. Manitius co-authored a paper that developed a method for feedback stabilization of delay systems by the 'finite spectrum assignment'. These papers stimulated research of many other authors, and generalizations or refinements of these results are still being published.

Dr. Olbrot was a Visiting Professor at the University of Minnesota in 1977, 1979-1980, and in 1987, where he collaborated with Professor E. Bruce Lee. He also visited Politecnico di Torino in 1984, 1985 and 1987, the Mathematical

in 1981 and 1986.

His research career made an interesting turn when in 1981 he became aware of the results of a Russian mathematician Kharitonov on the stability of the so-called interval polynomials and realized their importance for the robust stabilization of control systems. In 1982 he attended a workshop in Interlaken, Switzerland, where he brought this to the attention of the control community. Subsequently, a great number of journal and conference papers, and doctoral dissertations have been published on the applications of Kharitonov's theorem to robust control. Dr. Olbrot is generally credited with originating this line of research. He reoriented his own work and made several contributions to this area of parametric robustness of control systems. The most recent ones include a determination of stabilizability limits due to parameter perturbations in the pole placement theorem and extensions of the Edge Theorem to robust stability of systems with arbitrary delay structure or with distributed parameters.

In 1988 Dr. Olbrot joined the faculty of the Department of Electrical and Computer Engineering at Wayne State University in Detroit, MI. One of the motivations for this move was the possibility of research cooperation with the car industry, where computer-chip-based control of car engines was in its early stage. With all his interest in theoretical work, Andrzej Olbrot also wanted to see applications of control in industry. He built a collaboration with the research and development division of Ford Motor Company, which led to industrial funding of his research. While pursuing this direction at Wayne State University, he taught senior and graduate level courses and served as the advisor to numerous students who obtained their Ph.D. degrees under his direction.

Andrzej Olbrot was an excellent and creative teacher, who had demanding standards but still attracted large numbers of students. He was a dedicated and caring professor, who was very approachable but not easy on grades. He was well known, in Warsaw and at Wayne State University, for his open door policy for students. He always had time for students, he worked with them till he was sure they understood all the points, he would even follow them out of his office to explain additional points that he thought the students might have missed.

In all his activities, research collaborations, conferences, paper reviews, Andrzej displayed the same qualities that he showed to students: he was at the same time serious and cheerful, enthusiastic initiator and careful in formulating research conclusions, good colleague and friend, supportive and fair.

The news of his tragic death traveled instantly over the Internet to all his friends in the US and in Poland. Several sessions at the IEEE CDC conference in Tampa in December of 1998 were dedicated to his memory. The world has lost a valuable and innovative engineering educator and researcher, but he will not be lost in the memories of all those who came to know him personally or through his work.

On behalf of friends and colleagues of Andrzej Olbrot in Poland and abroad,
Andrzej Manitius