

THE SELF ADAPTIVE FLIGHT CONTROL SYSTEMS  
SYMPOSIUM

SESSION VI

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I think there is one thing from this morning's program that certainly strikes a teacher. Control engineers, in general, are starting to utilize and exploit to a rather remarkable extent the theories that have been developed by the feedback theory people and which we have occasionally tried to teach to our students. This is a very remarkable situation. This is not true in most of the other fields of electrical engineering. It certainly is going to call for us in the Universities to change our approach. One of my colleagues has summed up the attitude of the teaching profession very appropriately in a comment which some of you have heard. When a student asks him an embarrassing practical question like "why doesn't a hi fi work", he always replies with great disdain that his knowledge is completely unbesmirched by any practical application. I think the remarkable thing about the symposium so far has been the extent to which some of the feedback theories, concepts of multi-loop systems, and non-linear system theories have been put to work in the evaluation and design of control systems.

I think it might be well to point out that there is one aspect of adaptive systems which we seem to be overlooking entirely. I'm not sure anything can be done about this. There has been a great deal of interest among communications engineers in adaptive systems, or what they call adaptive systems. If you look at the proceedings of the last London conference on information theory, you find a great deal of talk about adaptive systems. What the communications engineer generally means by an adaptive system is one which involves an element of learning. We might design upon probabilistic models and changing the character of the non-linearities or the probabilistic model parameters, on the basis of experience we acquire so that we get a system which does some anticipation and is susceptible to learning on the basis of past experience. Perhaps this is another realm beyond where we are now with adaptive systems but it seems to me that the communications engineer's adaptive systems and the control engineer's adaptive system are probably too far apart and an important area is the merging of these two.