

EXTERNAL CONTROL OF HUMAN EXTREMITIES

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A word about the Symposium and the Proceedings

The Proceedings contain papers presented at the International Symposium on External Control of Human Extremities held at Dubrovnik, 1966.

The Symposium developed in a pleasant and informal atmosphere encouraging individual discussions and an exchange of opinions and experiences. A number of interesting films and slides was seen, as well as the demonstration of apparatuses and devices of some avantgarde research projects. Although the Proceedings had to be limited to paper submitted in writing only, we hope that they will contribute to the success of the Symposium and further research in this and related fields.

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FOREWORD

Among many meetings in prosthetics and orthotics the Symposium on External Control of Human Extremities should have a special role. In the last few years it has become more and more evident where the real difficulties in improving artificial limbs are. New materials and better design can produce more sophisticated equipment. But the problems of control of multifunctional prosthetic and orthotic devices comes then to the foreground.

In order to speed up the application of advanced control methods and thus open the way to more sophisticated rehabilitation devices, the first Symposium on External Control of Human Extremities was organized in Opatija. At that time the relation between advanced control methods and rehabilitation devices was very weak. However, the idea of applying the control theory to prosthetics and orthotics was accepted with much enthusiasm. This was the reason why preparations for another Symposium of that kind were started.

The second Symposium on External Control of Human Extremities reflected the important progress in this field since 1962. Instead of one artificial hand as in 1962, now four new designs were demonstrated. In contrast to the previous meeting in Dubrovnik, this time there was a general agreement that the future is in the multifunctional prosthetic hand devices. This trend is the result of advances in electronics and control engineering. Although the research efforts are clearly directed to the multifunctional artificial hands, it will take several years before full insight into the advantages of such a design will be obtained.

The end-point control remains an extremely challenging research field but with few general results. Several improved prosthetic and orthotic devices for the upper extremity were shown but the control problem was solved in the conventional way. Once the adequate mathematical description of the arm movements is obtained it will certainly help to simplify the end-point control and make it more efficient.

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The control theory for lower extremity devices is also at a developing stage. The papers covering this section of the meeting clearly show that automata study, adaptive and multilevel control can be used for a better understanding of locomotion and stability problems with bipeds.

If the first Symposium was a probing stone, the second Symposium clearly showed that specialized meetings on control problems in prosthetics and orthotics are welcomed by all specialists. We intend therefore to continue this practice and let us hope that the next meeting will confirm that we have been working in the right direction.

Prof. Rajko TOMOVIC