Pavol Brunovský
Seventy Years of Professor Jaroslav Kurzweil

SEVENTY YEARS OF PROFESSOR
JAROSLAV KURZWEIL

Jaroslav Kurzweil belongs to a strong generation of Czech mathematicians who initiated their professional career shortly after the World War. After a short period of research in number theory Kurzweil picked a subject which had hardly any tradition in the Czech mathematics – differential equations. Contacts with Soviet mathematics and even more with the Wazewski's school in Krakow gave him a good start at a time when there was little activity in the qualitative theory in West Europe and in America the foundations of its later massive development have been just being laid by S. Lefschetz.

From the very beginning of his research activity, for more than 20 years, Kurzweil presence has been felt in the mainstream development of the qualitative theory. Due to a rare combination of deep geometric insight, invention and technical brilliance his results have frequently been final or close to the limits of possibility. Such were already his first results on the conversion of Liapunov's theorems.

In the late fifties, in connection with his work on averaging Kurzweil picked up Gichman's observation, according to which convergence of primitives in time of the right hand sides of differential equations is sufficient for the convergence of solutions. Attempts to close the class of differential equations with respect to this convergence lead Kurzweil to the concept of generalized differential equations (GDE). His monumental work on GDE then became the leading component of his scientific production.

In the early sixties many differential equations helped specialists to lay fundaments of control theory. Kurzweil was no exception, he produced several fine contributions to the subject. His studies of periodic solutions of the weakly nonlinear string equations were one of the first attempts to carry over geometric methods from ordinary to partial differential equations. Kurzweil's papers of the late sixties and early seventies on integral manifolds for flows can be considered as a climax of a wave of interest in the subject. Paradoxically, due to their generality and delicacy, in the second wave of interest in integral manifolds in the eighties a good part of his results has been "rediscovered" in particular cases. His results on differential inclusions of the late seventies are small jewels which cannot leave cool anybody with a feeling for mathematical beauty.

Gradually, Kurzweil's interest shifted to the theory of integral. His work on GDE lead him to a concept close to Perron's integral. The integral he introduced and studied bears nowadays his name.[1]

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[1] For the scientific publications of J. Kurzweil see:

J. JARNÍK—Š. SCHWABIK—M. TVRDÝ,—I. VRKOČ: *Sixty years of Jaroslav Kurzweil*, Czechoslovak Math. J. **36**(**111**) (1986), 147–166.

J. JARNÍK—Š. SCHWABIK—M. TVRDÝ,—I. VRKOČ: *Jaroslav Kurzweil šedesátnikem*, Časopis Pěst. Mat. **111** (1986), 91–111.

J. JARNÍK—Š. SCHWABIK: *Jaroslav Kurzweil Septuagenerian*, Czechoslovak Math. J. **46**(**121**) (1996), 375–382.

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In 1962, J. Kurzweil and I. Babuška laid foundations of the Czecho-Slovak conferences on differential equations EQUADIFF by organizing EQUADIFF 1 in Prague. Hosting a good part of most prominent world specialists in the subject it was the first comprehensive international conference on differential equations in the world. It has been continued by seven more conferences of the series organized by turns in Prague, Bratislava and Brno. In the organization of most of them Kurzweil played a rôle, either as a president or as a member of the organizing committee.

As a person of unquestioned professional and personal authority, after the changes in 1989 Kurzweil was asked by the scientific community to take over important posts on both intramathematic and national level. He is now in his second term as a director of the Mathematical Institute of the Czech Academy of Science and has been the President of the Accreditation Committee for higher education institutions of the Czech government from the beginning.

Slovak mathematics has been lucky to benefit from the radiation of Kurzweil personality as well. From the beginning of his scientific career Kurzweil has maintained intensive contacts with Slovak mathematicians and was a frequent lecturer, visitor,referee and jury member in Slovakia. More important, research in control theory in Slovakia grew up under his direct influence. One of the currently dominant components of Slovak mathematics – geometric theory of ordinary and partial differential equations – can be traced to him as well.

The editorial committee and the author wish Professor J. Kurzweil to maintain his remarkable vitality for many years to come. We wish him to have the energy to continue his activities for the benefit of mathematics and science in general (including the Slovak one) as well as to find time to enjoy his beloved mathematics.

Pavel Brunovský