# İSTANBUL ANALYSIS SEMINARS

## Differential Equations with Piecewise Argument of Generalized Type: A New Theory for 25-Year-old Equations

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Differential equations with an argument of a solution as the greatest integer function were introduced in the beginning of the 1980s by K. Cook and G. Wiener . The only method of investigation of the systems has been the reduction of the equations to systems of discrete equations, which involves the values of solutions at integers. Thus, many questions common for all types of differential equations with continuous solutions: existence and uniqueness, dependence of solutions on parameters, etc, have not been fully investigated.

In our last papers we have proposed 1) to generalize the notion of the equation with piecewise constant argument; 2) to introduce an equivalent integral equation for the differential equation with piecewise constant argument of generalized type.

The new approach allows us to create a theory of these systems very similar to that of ODE despite the equations considered by us having deviating arguments.

In the report we discuss the results obtained by the members of the Applied Dynamics Group, Dept. of Math. and Inst. of Appl. Math. , METU (Ankara). The phenomenon of bifurcation and chaos for these equations and their applications to certain problems of population dynamics will be also considered.

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Bankalar Caddesi No:2 Karaköy İstanbul

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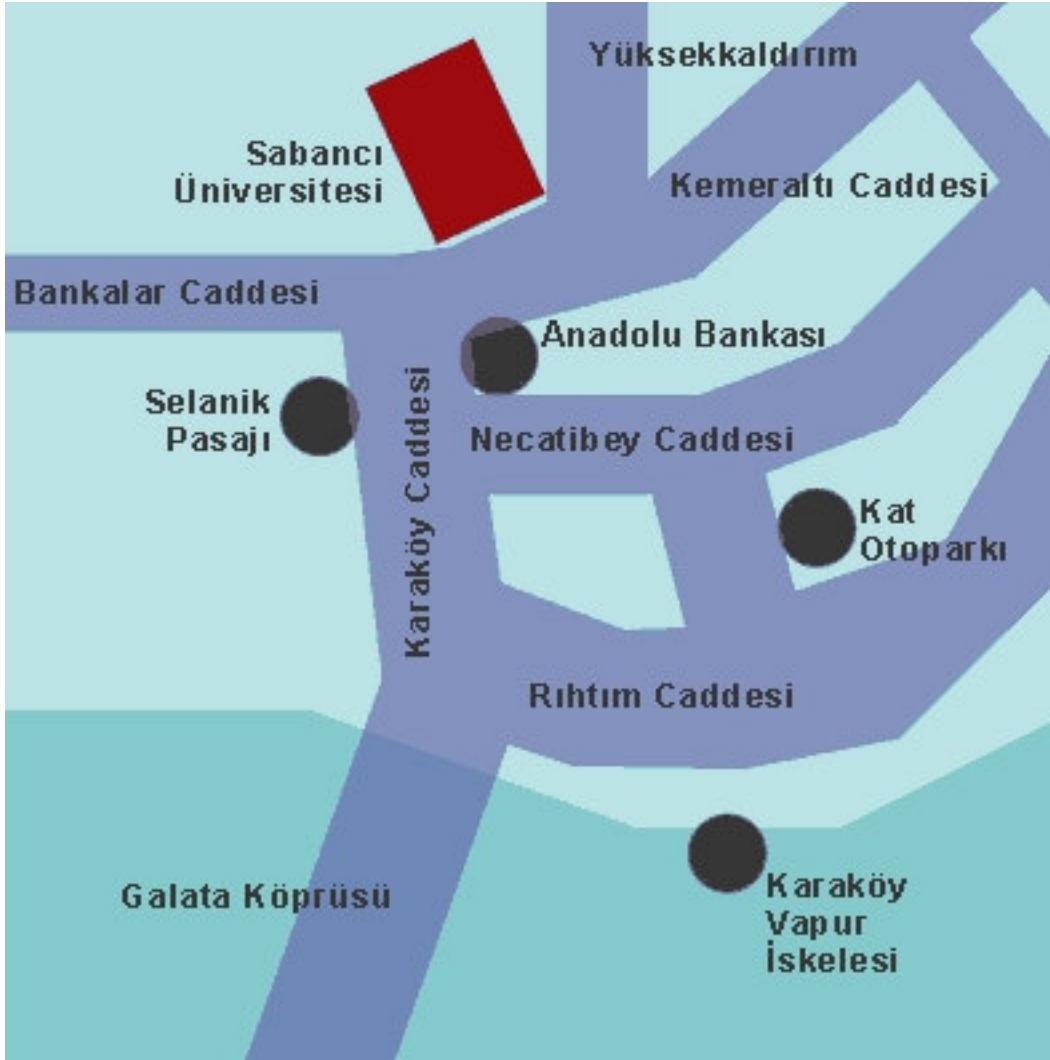
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Sketch of Karaköy İletişim Merkezi