

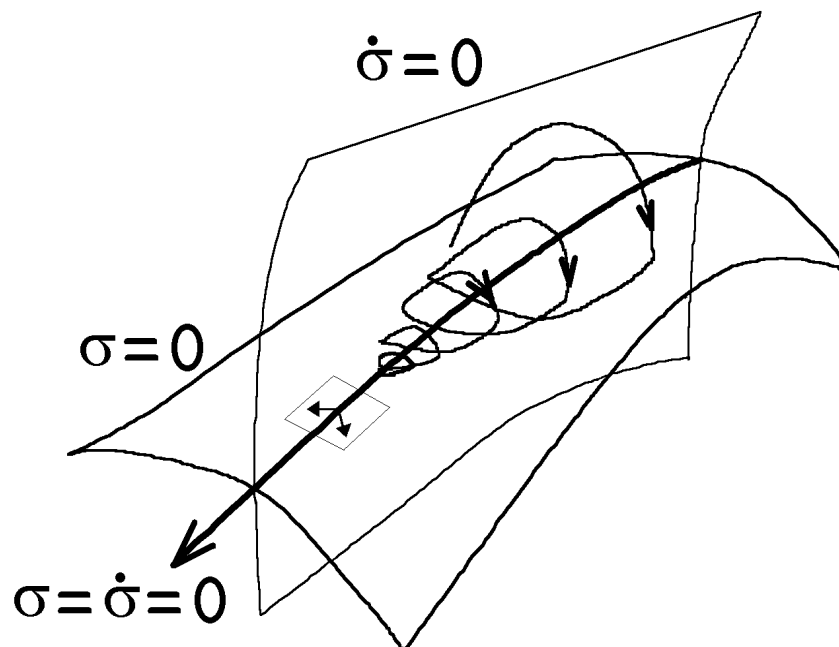
## Advanced Topics in Applied Mathematics

Various applied-mathematics problems coming from the real industry as well as from the theoretical background are considered. The practical examples include automatic page layout, numeric aesthetic criteria, motion capture in cartoons, automatic pattern recognition, aircraft control design, real-time robust exact differentiation, edge detection, black-box control. The real-time programming notion is introduced. The theoretical areas to be considered include differential equations with discontinuous right-hand sides, differential inclusions and their applications in nonlinear control and signal processing.

A number of subjects and corresponding literature will be proposed to the participants to prepare a presentation. The participants are welcome to suggest themselves any interesting mathematical subjects coming from the real applications. Another way of the active participation is to perform the computer simulation of the on-line noisy-signal differentiation or some simple control design. This will require some programming skills (MatLab, C++, C, Java, etc).

The seminar homepage: <http://www.tau.ac.il/~levant/mathappl/index.html>

The needed background: standard courses of mathematical analysis, linear algebra, and differential equations.



Differential equations with discontinuous right-hand side: second-order sliding mode.