Chapter 1

# The Sliding Mode Technique and Technology (SM T&T) According to Vardan Mkrttchian in Intellectual Control(IC)

## ABSTRACT

*By intellectual control we mean the total of engineering tools and software joined by the information process and working in coordination with a person (a group of people), able to synthesize goals on the basis of the data and knowledge, take decisions for action and find rational means of achieving aims. As it was mentioned in this chapter, the sliding mode data serves the ground for a new methodology and technology of intellectual control and communications. This chapter covers the research into scientific and methodological framework for creating sustainable sliding modes in non-engineering systems of intellectual control, search for possibilities of self-organization of sliding modes methods and technologies enabled by accumulation of the data on their work in the process of their functioning with intellectual control. This allows of undertaking more exact control methods which is impossible at the initial stage because of the incomplete knowledge of environment impact and the state of the system itself and, most importantly, the object of control in a non-engineering system.*

## INTRODUCTION

We offer to base any structure of intellectual control of non-engineering processes on the concept of sliding mode in animated nature which is defined as a continuous formation with the feedback information about the results of the action. Each functional system responsible for this or that adaptation effect has numerous channels along which the information from the periphery reaches the corresponding centers. The useful adaptation effect is the central point in any functional system in sliding mode as it promotes reaching the goal which in its turn serves as a system-building factor. The distinctive features of any result, even the smallest one contributing to the goal-reaching is it being produced according to the self-regulation principle irrespective of the level and complexity and possesses the same switch configuration mechanisms. In non-engineering systems these mechanisms are as follows: afforestation goal synthesis; taking decisions for action; efferent action program; action acceptor forecasting the parameters of the prospective result; return afforestation about the parameters of the result of the action; comparison of the parameters of the real result to the parameters forecast or predicted in the action acceptor. All this fits the sliding mode ways.

## MAIN FOCUS IN CHAPTER

## Solutions and Recommendations

We developed out the diagram of intellectual control which uses calculated and constantly controlled sliding mode in the space of non-engineering system states for adaptation, self-management and self-regulation (Figure 1).
  Our system of control consists of two blocks, the first of which synthesizes goal, the second – the process of achieving the goal. The first block as the primary component features motivation (the need for something) which is combined with the information obtained with the help of the system of transducers about the state of environment and the system proper. While synthesizing the goal, the knowledge is used actively, i.e. based on the knowledge kept in the system memory, the environment and the system proper are stimulated by the trigger signals accompanied by the active evaluation of the irritants from the environment. Further the information gets into the sliding mode indicator which realizes the algorithms of action program functioning,

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