



Government of India  
Ministry of Human Resource  
Development



# Insight into fuzzy modeling: Reasoning in fuzzy natural logic and its applications

## Overview

Fuzzy modeling is a group of special mathematical methods that make it possible to include in the model imprecise or vaguely formulated expert information that is often characterized using natural language only. The developed models called fuzzy models are very successful because they provide solution in situations when traditional mathematical models fail — either due to their non-adequacy, or due to their inability to utilize the full available information.

In this course, the audience will be acquainted with various areas of fuzzy modeling that utilize results of mathematical fuzzy logic and linguistics. Besides that, we will also discuss some kinds of applications. The course will be divided into two parts. First, we will introduce the theory of fuzzy modeling. In the second part, we will present some selected applications in control, decision-making and time series analysis and forecasting. A special attention will be paid to the theory and modern applications of fuzzy IF-THEN rules. We present two complementary views of their methodology. The first, more traditional view, involves fuzzy approximation and the theory of fuzzy relations. The second view is based on a combination of formal fuzzy logic and linguistics. We speak about fuzzy/linguistic interpretation, according to which the rule is interpreted as a conditional clause of natural language and a set of such rules is taken as a special text on the basis of which a conclusion/decision can be made. We demonstrate the power of such approach in various kinds of decision situations, and also in fuzzy control and multi-criteria decision-making.

<b>Course Schedule</b>	<b>October 23-27, 2017</b> Number of participants for the course will be limited to fifty.
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>• Executives, engineers and researchers from manufacturing, service and government organizations including R&amp;D laboratories.</li> <li>• Student at levels (M.Sc./M.Tech./Ph.D.) or Faculty from academic institutions.</li> </ul>
<b>Fees</b>	<p><b>One-Time GIAN Registration:</b> Please visit <a href="http://www.gian.iitkgp.ac.in/GREGN/">http://www.gian.iitkgp.ac.in/GREGN/</a> and register by paying Rs. 500/- (those who have already been paid, need not pay again). The participation fees for taking the course is as follows:</p> <p>Participants from abroad: US \$400  Industry/ Research Organizations: Rs. 10000  Academic Institutions:  a) Institute Faculty: Rs. 5000  b) Student: Rs 3000</p> <p>The above fees include all instructional materials, computer use for tutorials and assignments (if any). The participants will be provided with accommodation on payment basis.</p>



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## The Faculty



**Prof. Vilem Novak** is currently working as Director of the Institute for Research and Applications of Fuzzy Modeling Centre of Excellence IT4Innovations, Division of the University of Ostrava. Prof. Novak, a Ph.D. from Charles University, Prague, is working in

the areas of mathematical fuzzy logic, mathematical modeling of linguistic semantics and fuzzy natural logic, fuzzy modeling, and modeling with words and their applications. He is author or co-author of more than 260 scientific works. Prof. Novak has completed nine national and ten international research projects. Prof. Novak visited Germany, Poland, Hungary, Austria, USA, Italy, Finland, Korea, Japan, Russia, China, Netherlands for lectures and research stays.



**Dr. S.P. Tiwari** is currently working as an Associate Professor, Department of Applied Mathematics, Indian Institute of Technology (Indian School of Mines), Dhanbad. Dr. Tiwari, a Ph.D. from Banaras Hindu University, Varanasi, is working in the areas of use of topology and category theory in fuzzy automata theory and  $F$ -transforms.

## Course Coordinator

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