ANALYSIS SEMINAR

CONTEMPORARY FUZZY APPROXIMATION METHODS

GEORGE ANASTASSIOU
UNIVERSITY OF MEMPHIS

WEDNESDAY, MARCH 9 2005, IN ROOM 331 AT 3:00 PM

Abstract: *We talk first about the necessity of studing fuzzyness in real world and mathematics as fuzzuness stands as a separate genuine feature of our physical and ideal world apart from deterministic and random systems. We introduce the fuzzy real numbers with their properties and the fuzzy functions and we talk about their calculus and its connections to ordinary one. We then present a complete study for the approximation of fuzzy functions by fuzzy wavelet type operators and fuzzy convolution type operators. The convergence with respect to fuzzy metric is given with rates involving the fuzzy modulus of continuity of associated fuzzy function. Separately we talk about the properties of fuzzy modulus of continuity. These approximations derive via fuzzy Jackson type inequalities many times that are proved sharp. The approximating operators inherit shape properties of the approximated functions. They can preserve fuzzy monotonicity and fuzzy convexity and most important they possess the property of preservation of fuzzy global smoothness. The last means the operators as they approximate function cannot oscillate more than the function. This feature is express via sharp inequalities. So approximation takes place nicely and tightly.*