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SEMI TRANSITIVE MAPS IN FUZZY DYNAMICAL SYSTEM

Murtadha Mohammed Abdulkadhim

Al-Muthanna University, College of Education, Department of Mathematics,
Al-Muthanna, Iraq

ABSTRACT

Let (X, f) be dynamical system,. (X, f) is semi transitive if for every pair of non-empty semi open subset $J.K$ in X ,there is a positive integer n such that $f^n(J) \cap K \neq \phi$. In this works we study semi transitive map and generalize some equivalent definitions of semi transitive. A function where is the system; Based space denotes], - fuzzy topology on defined as describing the minimalist, transitivity and topological entropy for dynamical system on a fuzzy like other physical and geometric concepts will be applied to this uncertainty in natural systems suggests a rational explanation.

Keyword: Relative Semi-dynamical System, Transitivity, Relative Topological Entropy.

1. INTRODUCTION

Study on natural systems Dynamics modeling of any scientific approach is (analytical, numerical or overview). in this case, a mathematical model under consideration is an appropriate representation of natural order; Predictions about this specific values allows us to or that certain things are followed from others by showing necessary explanations provides a model is accepted or validated by the evaluation of its accuracy, i.e., how well the formal system describes the natural system? The theory of experimental observations and/or measurements can be done by matching up with system theory; we summarize the process of mathematical modeling as follows:

1. Beginner's observations, we have a question or a conceptual framework within which the hypothesis (model) start with the check.
2. Testing and validating the model with experimental data but not all data are also crisp facts overview through the process of getting the observer depends on the idea so we thought "of the observer to evaluate up to two main points of a mathematical model and fuzzy version.

A mathematical model underlying the evolution of a dynamical system in uncertainty and fuzziness, we will apply the above concepts. In this case, any variation and/or approximation on a system must be identified by a supervisor. In addition, we also drastic the complexity and/or supervisors measuring uncertainty is of the system through the one to observers, the comparison between a perspective of law. First, we must identify our mathematical observer approaches, there is a one to one correspondence between [0, 1] X, all functions μ: x-→ [0, 1], where x denotes the base space of the system supervisors. We in the case of any structure or μ on x should indicate-or mobility μ-μ from the point of view of the relative who means. For example: μ fuzzy topology on x by the eyes of the observer describes the topological dynamical system a fuzzy notion is [2, 4, 9], which is called relative semi dynamical system to extend the observer perspective related to explain the dynamics of the system [6] in. [1]

2. DESCRIPTION FOR SEMI-TRANSITIVE MAPS IN FUZZY

In the literature of fuzzy sets, the word fuzzy often stands for the word vague. Some comment on the links between vagueness and fuzziness is useful. In common use, there is a property of objects called "fuzziness"; see also Rolf (1980). From the Oxford English Dictionary we read that "fuzzy" means either not firm or sound in substance, or fringed into loose fibers. Fuzzy means also covered by fuzz, i.e., with loose volatile matter. Alike any other characteristic, "fuzzy" can be used to form a predicate of the form: "something is fuzzy". For example "a bear is fuzzy". It may sound strange to say that "bald is fuzzy", or that "young is fuzzy". Words (adjectives in this case) bald and young are vague (but not fuzzy in the material sense) because their meanings are not fixed by sharp boundaries. Similarly, objects are not vague

Here however, the word "fuzzy" is applied to words, especially predicates, and is supposed to refer to the gradual nature of some of these words, which causes them to appear as vague. However, the term "vagueness" designates a much larger kind of ill-definition for words (including ambiguity), generally.

The specificity of fuzzy sets is to capture the idea of partial membership. The characteristic function of a fuzzy set, often called membership function, is a function whose range is an ordered membership set containing more than two (often a continuum of) values (typically, the unit interval). Therefore, a fuzzy set is often understood as a function. This has been a source of criticism from mathematicians (Arbib, 1977) as functions are already well-known, and a theory of functions already exists. However, the novelty of fuzzy set theory, as first proposed by Zadeh, is to treat functions as if they were subsets of their domains, since such functions are used to represent gradual categories. It means that classical set-theoretic notions like intersection, union, complement, inclusion, etc. are extended so as to combine functions ranging on an ordered membership set. In elementary fuzzy set theory, the

Set-union of functions is performed by taking their point wise maximum, their intersection by their point wise minimum, their complementation by means of an order-reversing automorphism of the membership scale, and set-inclusion by the point wise inequality between functions. This point of view had not been envisaged earlier by mathematicians, if we except some pioneers, mainly logicians. Fuzzy set theory is indeed closely connected to many-valued logics that appeared in the thirties, if degrees of membership are understood as degrees of truth, intersection as conjunction, union as disjunction, complementation as negation and set-inclusion as implication.

2.1 Benefits of Fuzzy technology

The benefits of fuzzy technology **d**emonstration attracted the attention of certainly the world. Complex processes under the control of a monitor now the list also in the creation of serious problems. Technology is well known control algorithms usually an ambiguity which naturally exists in practice unable to cope with his frequent such processes satisfactorily. Accurate data and detailed description available of the processed device is under control and without reason in a qualitative fashion about this process due to the ability to interpret the language of the statement are controlled by system. In many cases, the observation that a system input of control often includes full closed-loop automatic control to self doubt lead optimization and the ability to reject bad measurements gave superior performance.

Data control operation in the presence of uncertainty the major features which include analysis and design techniques for control engineering of the 80s was artificial intelligence has opened up a new trend stemming from, especially expert systems (knowledge based systems) specialize in control technology is responsible for a new technology called.

Expert control, a novel and promising perspective control pattern due to a deeper understanding of the role of engineering has attracted much attention worldwide. Through intelligent digital computer knowledge-based systems approach to represent dynamic systems, expert systems are the subject of so much recent publicity has attracted all desirable features a replica of the clear benefits. Closed-loop automation control while retaining all the benefits of system input clearly the desirable objectives.

In short, this new approach is that the expert system technology system and well known are characterized by control engineering depends on amalgamating. Fuzzy sets and fuzzy logic we are confident that this new paradigm to implement can be a convenient tool for the emergence of rule-based languages. Set with what's known as "fuzzy fuzzy control and system have been added to the research incentive Have knowledge. [3] [5]

2.2 Classical Control

Classical control systems, most of the existing design techniques for steady state operating conditions resulting from the linearization of nonlinear systems around them are based on linear models. But, in the case of large perturbations of steady state variables, based on the design of linear model plants no longer good enough. Design technique and partial differential equations, and systems with different delay elements Described by complex systems, nonlinear systems. Industrial process applications which are vague, imprecise and the most basic control designer [8] [9] one of the complex issues facing gets feedback control theory.

2.3 Modern Control

Modern control theory has had tremendous success in the areas where the system is well needed either deterministically or stochastically. This is particularly true in aerospace systems such as missile and space vehicle guidance systems where the modern control theory has been proved to be very useful.

Control scientists and engineers have unsuccessfully, however, attempted to apply the same theory to complex plants, to name a few, such as manufacturing, chemical process, pulp and paper mills, power plants, steel making, and cement kilns. On the other hand, vagueness, imprecision and ambiguity have not deterred designers from taking actions. Communication between system is in linguistic terms in contrast to precise numeric data as demanded by digital computers.

2.4 Fuzzy Logic Control

Since the capability of communication in a natural way plays an important role in fuzzy logic allows the knowledge represented by linguistic variables and a set of IF...., THEN.... rules seems to be a promising approach in tackling the dynamic control systems which are ill.

Fuzzy logic control interests in recent years made a number of successful applications have been reported in the literature and many professional design tool available in the market. These applications a target tracking system, three-phase induction motor control, tank water level control, automatic Train operation control, water purification process, and include auto focus control camcorder. Most recently, FLC VLSI technology in commercial applications in Japan washing machines products, vacuum cleaners, air conditioners and cameras as [4]. The significance of the FLC in industrial applications is the fact that a nonlinear mapping inputs and outputs of the process requires a favorite from. [3] [5] [7]

2.5 Knowledge Representation

The knowledge base is a repository of vague and uncertain knowledge to use fuzzy logic uses storing of crisp concepts and symbolism more than satisfactory performance of.
Fuzzy-logic fault output rule knowledge base as well condition control system includes linguistic action parts rules if ..., then ... those expert knowledge systems.

2.6 Approximate Reasoning

As far as the fuzzy technology is concerned in the essential characteristics is of an approximate reasoning. Lot a. Zadech said that the best interpolation fuzzy logic [16] plays a central role in learning from examples of projection and input.-a collection of the output of the joint systems build a model. We usually add fuzzy input-output values, if the rule is that linguistic or fuzzy variable whose value Numbers rather than words (fuzzy sets) are related to the structure of the linguistic variable input and while people. Generally, fuzzy systems is when we work experiences or introspection so if rules to articulate well. When we can't do tithe rules for generating neural network techniques may be required. [8]

2.7 Mixed fuzzy topological dynamical system

In this section we will construct mixed fuzzy topological dynamical system from two given systems. First we prove a result, which characterize fuzzy topology in terms of neighborhood systems. Result, Let X be a non-empty set and for any $x \in X$ let Nx be the collection of fuzzy subsets of X such that the following conditions are satisfied.

(i) Each non-zero constant fuzzy set belongs to Nx and if $\mu \in Nx, then\ \mu(x) > 0$.
(ii) $\mu, v \in Nx \Rightarrow \mu \cap v \in Nx$
(iii) $\mu \in Nx\ and\ \mu \subseteq v \Rightarrow v \in Nx$
(iv) $If\ \mu \in Nx, then\ \exists v \in Nx : v \subseteq \mu\ and\ v \in Ny$ for any y with $v(y) > 0$. Then the collection $\tau = \{\mu \in IX: \mu \in Nx\ \forall x\ with\ \mu(x) > 0\}$ is a fuzzy topology on X where the neighborhood system of each x coincides with Nx.

Proof.: Since for no $x \in X, 0(x) > 0, 0 \in \tau$ trivially.
By property (i) all constant fuzzy set belongs to τ. By Property (ii) τ is closed under finite intersection and by property (iii) τ is closed under arbitrary union. Thus τ is fuzzy topology on X.
Next we show that each member of Nx is a neighborhood of x. Let $\mu \in Nx$. Then by (iv) we have $\exists v \in Nx: v \subseteq \mu$ and $v \in Ny$ for any y with $v(y) > 0$. But then by definition of τ, v is open. Also as $v \in Nx\ by\ (i)\ v(x) > 0$. Thus μ contains a member v of τ with $v(x) > 0$. Hence μ is a nbd. of x. Conversely let μ be nbd. of $x\ w.r.t.\tau$. Then μ contains a member $v\ of\ \tau$ with v(x) > 0. But then by definition of τ, v ∈ Nx. So by property (iii) μ ∈ Nx.
Thus the nbds of x are precisely the members of Nx.
The next result gives the construction of a mixed fuzzy topology. [1][3][5]

3. LITERATURE SURVEY

K, Ciesielski, at negative escape time semi dynamical systems, UIAM, Fasciculus XLI, 2003. Ward et al. (1992) is a c language based on fuzzy overall framework ' Rinks plan program develop program Rinks ' decision rules, membership data functions and HMMS. Program, writers Rinks ' 1981 endings include the program modified repeated. Tri and exponential membership is functions and a detailed rule base. 2.0 to 4.5 percent as a result of cost increases when membership functions were changed. Enhanced rules based closely match the total cost of the solution produced the Rinks. Dumitrescu, D. c. Haloiu and a. Dumitrescu, fuzzy dynamical systems, fuzzy sets and systems General et al. (1992) the generator a fuzzy multiple objective planning set models present. Model is formulated as a fuzzy multi-objective programming model, technological objective function coefficients with coefficients and resources right hand side value, triangular fuzzy numbers by Rep. Present your data. A change process planning model multiple objective fuzzy set model for converting a crisp. Conversion process and computational algorithm is a six-term plan includes a numerical example for horizon showed. Total production costs, inventory and backorder costs, and changes to the work force level to minimize many of the objectives we used.

3.1 How to Work Fuzzy Dynamical System

In this paper the observer's point of view and perception of minimalist concept of transitivity is considered an extended section. The topological entropy, stream 1 to classify some conjugate relationship relative semi dynamical system, under an immovable object is represented in the end. Ena, course programming in computational example is illustrated in section 4 we relative struc fuzzy systems, Vancouver, British Colombia, anada, June 19-21, 2007 170 8th WSEAS International Conference on turns the proceedings of some of the basic notations recalls. "We believe that is a non-empty set X, and $\mu \in X, i.e. is\ [0,1]$ fuzzy subset x. in addition we assume that τμ which means the members of a collection $A\ x\ a\ \mu$ fuzzy topology $[0,1]\ X$ [4] with the following properties:

i) $M, \chi\varphi \in \tau\mu$ where χ is the characteristic function;
ii) If $\lambda \in \tau\mu$ then $\lambda \subseteq \mu, i.e. \lambda(x) \leq \mu(x)\ on\ X$;
iii) If $\lambda 1, \lambda 2 \in$ τμ then $\lambda 1 \cap \lambda 2 \in \tau\mu$;
iv) If $\{\lambda i: i \in \Gamma\} \subset$ τμ then _ i∈ $\Gamma\ \lambda i \in \tau\mu$.

In some sense τμ is a fuzzy model of the topology on X from the viewpoint of the observer μ. However, if we denote $\lambda\alpha = \{x \in X: \lambda(x) > \alpha\}$ and $(\tau\mu)\ \alpha = \{\lambda\alpha: \lambda \in \tau\mu\}$ for the given α (0, 1], them $(\mu\alpha, (\tau\mu)\ \alpha)$ can be consider as a crisp topological.

With the above notations, let (X, τμ) denotes a μ- fuzzy topological space; a mapping $f: X \rightarrow X$ is called (μ, μ)-fuzzy continuous if $f - 1\ (\eta) \cap \mu \in \tau\mu$ for all $\eta \in \tau\mu$, where $f - 1\ (\eta)\ (x) = \eta\ (f(x))$. Moreover the triple $(f, X, \tau\mu)$ is called relative semi-dynamical system.

3.1.1 Minimality and Transitivity on RSD-Systems

Definition 1 An RSD-system $(f, X, \tau\mu)$ is called a minimal relative semi-dynamical system on μA or briefly"μA-minimal" if: i) $f\ (\mu A) \subset \mu A$; $ii)\ For\ all\ x \in \mu\alpha$, the set $\{FN(x): n = 0, 1, 2, \}$ is a dense subset of μα, where the topology of μα is (τμ) α.

Theorem 2 $let\ \alpha \in [0,1]. If\ (fix, \tau\mu)$ is an RSD system, then the following statements are equivalent.

i) F is μA-minimal.
ii) Let $f\ (\mu\alpha) \subset \mu\alpha$. If C is a closed subset of the topological space $(\mu\alpha, (\tau\mu)\ \alpha)$ such that $f(C) \subset C, then\ C = \mu\alpha\ or\ C = \emptyset$.
iii) Let $f\ (\mu\alpha) \subset \mu\alpha. If\ O \in (\tau\mu)\ \alpha$ is a nonempty open set, then $\mu\alpha =$ _0 $n = -\infty\ FN\ (O)$, $where\ f0\ (O) = O$.

Proof:
i) $\Longrightarrow$ ii) Let $f\ (\mu A) \subset \mu\alpha$. Suppose that C is a nonempty closed subset of $\mu\alpha\ and\ f(C) \subset C$. so there exists $x \in C$ such that $\mu\alpha = \{FN(x): n = 1, 2, \} \subset C$. Therefore $C = \mu\alpha$.

$ii) \implies iii)$ If $f\ (\mu\alpha) \subset \mu\alpha\ and\ O \in (\tau\mu)\ \alpha$, then there exists $\lambda \in \tau\mu$ such that $O = \lambda\alpha$. The straightforward calculation shows that $f-1\ (O) = (f-1\ (\lambda))\ \alpha$. Therefore $C = \mu\alpha - \_0\ n = -\infty\ FN\ (O)$ is a closed subset of μα. Moreover $f(C) \subset C$ and C is a nonempty set.
$iii) \implies i)$ Suppose that $x \in \mu\alpha$ be given and O is a nonempty open subset of $\mu\alpha;\ then\ x \in f - n\ (O)\ for\ some\ n \in \{0\} \cup N$. Therefore $FN(x) \in O$. Thus we can see that $\{FN(x)\colon n = 1, 2, \} = \mu\alpha.\_$ we recall [6], that a subset D of X is called invariant for the RSD-system $(f, X, \tau\mu)\ if\ f\ (D) \subset D$. An invariant subset D of μα is called μα-minimal if f: $D \longrightarrow D$ is D-minimal. [4]

4. QUALITY MANAGEMENT

Research on fuzzy quality management is broken down into three areas, acceptance sampling, statistical process control, and general quality management topics.

4.1 Acceptance Sampling

Oath and Ichihashi (1988) present a fuzzy design methodology for single stage, two-point attribute sampling plans. An algorithm is presented and example sampling plans are generated when producer's and consumer's risk are denied by triangular fuzzy numbers. The authors do not address how to derive the membership functions for consumer's and producer's risk.

Chakrabarti (1988, 1994a) featuring a single sample size and sampling plan important pricing issue when producer and consumer risk of imprecision in the assay in a 1988 paper is fuzzy goal programming model and solution process provided many numerical examples are described. And resultant sampling plans to evaluate the sensitivity of strength. 1994a paper details how probability theory and triangular fuzzy numbers single sampling plan Design used in the problem.

Kanagawa and Oath (1990) Oath and Ichihashi sample plan design process identified two limits. First of all, the design of the process clearly Ichihashi Oath and sampling plan sample size less than. Second, consumer and producer, membership functions used unrealistically risk model these decencies and fuzzy mathematical programming subscription function a nonlinear solution method in the sample size of incorporation are right through.

4.2 Statistical Process Control

Bradshaw (1983) uses fuzzy set theory as a basis for interpreting the representation of a graded degree of product conformance with a quality standard. When the costs resulting from substandard quality are related to the extent of nonconformance, a compatibility function exists which describes the grade of nonconformance associated with any given value of that quality characteristic. This compatibility function can then be used to construct fuzzy economic control charts on an acceptance control chart. The author stresses that fuzzy economic control chart limits are advantageous over traditional acceptance charts in that fuzzy economic control charts provide information on the severity as well as the frequency of product nonconformance.

Wang and Raz (1990) illustrate two approaches for constructing variable control charts based on linguistic data. When product quality can be classier using terms such as 'perfect', 'good', 'poor', etc., membership functions can be used to quantify the linguistic quality descriptions. Representative (scalar) values for the fuzzy measures may be found using any one of four commonly used methods:

(i) By using the fuzzy mode.
(ii) The alpha-level fuzzy midrange.
(iii) The fuzzy median.
(iv) The fuzzy average.

The representative values that result from any of these methods are then used to construct the control limits of the control chart. Wang and Raz illustrate the construction of an x-bar chart using the 'probabilistic' control limits based on the estimate of the process mean,

4.3 General Topics in Quality Management

Currently a fuzzy quality function deployment (FQFD) system in which the voice of the customer "both linguistic and crisp variable can be expressed as a structure appeared and khoum (1996). FQFD system to facilitate the process of documentation is used and four (planning, deployment, and operations quality control) modules and a coordinating control mechanism supporting the database link through ve. [8]

5. CONCLUSION

Fuzzy Dynamical Systems through the mapped method is a very useful approach to literature and cognition analysis of complex dynamical systems models and tools has been proven to. There are different applications of FD in the domain of study is a substantial number and applications of FDSs is a fast forward also increases Ena emerge. they are helpful to decision makers to explore their adequacy and possibly the introduction of any necessary changes to indicate any position on their representation in the various scientific fields to apply when the FDSs is especially friendly and knowing FDSs, causalities, offer efficient methods to quantify each domain handles with complex functions as follows Maybe it's a research challenge is to improve the performance of the FD.

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