

# **Report on the visit of IEEE Computational Intelligence Society**

## **Distinguished Lecturer Professor James Bezdek**

### **to the Saint Louis Chapter**

Due to social distancing requirements during the current COVID-19 Pandemic, Dr. Bezdek presented his lecture remotely via a zoom meeting. Details are as follows:

#### **Distinguished Lecture**

**Presenter:** Dr. James Bezdek

**Date:** November 16, 2020, 12:00 PM to 2:00PM United States Central Time

**Organizer:** Steven Corns, Chair of IEEE CIS Saint Louis Chapter

**Location:** Zoom meeting

**Title:** Fuzzy Systems 101

**Abstract:** This talk begins with a discussion of uncertainty in the real world, and how it is modeled in science. Zadeh's 1965 paper is the basis for most of the material in this talk, which evolves using the set-theoretic (as opposed to logic-based) description of fuzzy models. I will spend some time characterizing the mathematical and philosophical differences between the fuzzy and probabilistic approaches to modeling uncertainty. Membership functions are on display and are seen to be the atomic units of fuzzy models. I will give several examples of finding and using membership functions from real life situations and data sets.

**Description:** Chapter members were notified of the event through emails and announcements at academic and research institutions. The event was also co-sponsored by the Missouri University of Science and Technology Engineering Management and Systems Engineering Department as part of the Sarchet Lecture series.

As in introductory lecture, the presentation was made available to all who wished to attend from both the CIS chapter, Missouri University of Science and Technology, and the University of Missouri – Columbia. The ease of access afforded by zoom allowed for a large attendance of 25 IEEE members and 32 guests. Dr. Bezdek is not only a pioneer in the field, but also a very dynamic speaker. The talk was very well received, with Dr. Bezdek inviting attendees to contact him personally for any follow up questions they may have. The Chapter and University both give their appreciation for the wonderful talk, and would recommend it to any who wish to expand participation in CIS. Some screenshots of the meeting are included below.

# FUZZY MODELS 101



Mack Tuna, 2014  
Gold Coast, Australia

11/16/2020

Fuzzy Models 101

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- 1 Uncertainty and Fuzzy Sets
- 2 Membership Functions
- 3 Basic Fuzzy Sets Operations

We *realize* fuzzy uncertainty in computer models by introducing *Uncertainty in Set Theory*

SETS "contain" *objects* with *two* kinds of properties



11/16/2020

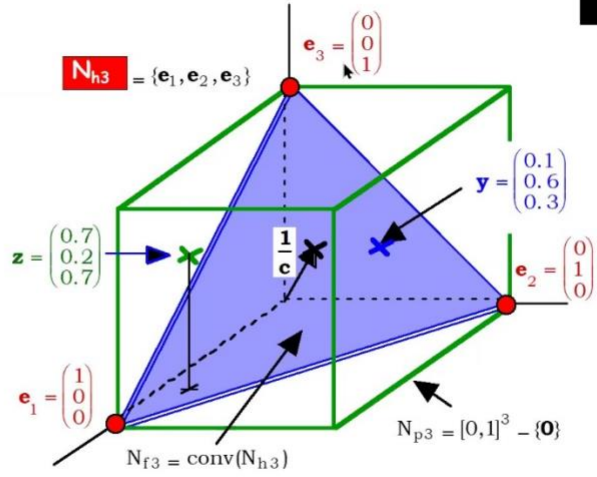
Fuzzy Models 101

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Q4: How are fuzzy models used in pattern recognition?

Crisp  
= Vertices



3 kinds of Label Vectors for 4 types of models @ c = 3

