Greetings

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Biographical notes: Lotfi A. Zadeh joined the Department of Electrical Engineering at the University of California, Berkeley, in 1959, and served as its chairman from 1963 to 1968. Earlier, he was a member of the electrical engineering faculty at Columbia University. In 1956, he was a visiting member of the Institute for Advanced Study in Princeton, New Jersey. In addition, he held a number of other visiting appointments, among them a visiting professorship in Electrical Engineering at MIT in 1962 and 1968; a visiting scientist appointment at IBM Research Laboratory, San Jose, CA, in 1968, 1973, and 1977; and visiting scholar appointments at the AI Center, SRI International, in 1981, and at the Center for the Study of Language and Information, Stanford University, in 1987-1988. Currently, he is a Professor in the Graduate School, and is serving as the Director of Berkeley Initiative in Soft Computing.

The debut of "Advanced Intelligence Paradigms" or AIP for short, is a significant event in the evolution of artificial intelligence. AIP is the brainchild of Professors V. Balas and L.C. Jain, who serve as Editors-in-Chief. Their vision, drive and initiative bode well for the success of the journal.

There is an important point that should be made. AI was born in 1956. AI was then, and for many years thereafter, the object of exaggerated expectations. No views to the contrary were tolerated. As an example of exaggeration, the headline of an article published in the late 1940s read 'Electric brain capable of translating foreign languages is being built'. At that time, the reality was that there were only a few relay computers in existence. Today, six decades later, we have translation software but nothing that approaches the level of human translation.

In large measure, AI was based on symbolic logic, with unwelcome signs hung for methods involving numerical computations. Probability theory, optimisation techniques, decision analysis and fuzzy logic were non-grata. Gradually, it became obvious that AI had to step out of its self-imposed isolation and embrace tools which are needed to deal with uncertainty. In the 1980s, the work of Judea Pearl opened the door to probability theory. Today, probability-based techniques are in fashion. In fact, the so-called 'New AI' is probability-based in contrast to the 'Old AI', which is symbolic-logic-based.

Addition of probability theory to the armamentarium of AI was certainly a step in the right direction. But was it sufficient? In my 2001 paper 'A new direction in AI – toward a computational theory of perceptions', I argued that to achieve human-level machine

intelligence AI must develop a machinery for dealing with perceptions – a machinery which AI does not have. Humans have two remarkable capabilities. First, the capability to perform a wide variety of physical and mental tasks, e.g., driving a car in heavy city traffic, without any measurements and any computations; and second, the capability to converse, reason and make rational decisions in an environment of imprecision, uncertainty, incompleteness of information, partiality of truth and partiality of possibility. Formalisation/mechanisation of these capabilities is beyond the reach of bivalent logic and bivalent-logic-based probability theory.

In my 2001 paper, I outlined what I called the computational theory of perceptions. In this theory, the objects of computation are not perceptions per se, but their descriptions in a natural language. A formalism which is employed for computation with perceptions is NL-Computation. In NL-Computation, the objects of computation are not values of variables but information about the values of variables. NL-Computation is based on fuzzy logic.

Fuzzy logic is a major generalisation of classical, Aristotelian, bivalent logic. Fuzzy logic is not fuzzy. Basically, fuzzy logic is a precise logic of imprecision and approximate reasoning. What is widely unrecognised within the AI community is that fuzzy logic can make an important contribution to the advancement of AI. Knowing Professors Jain and Balas, I am confident that they will take an enlightened view of the AI paradigms which are needed to achieve human-level machine intelligence. This is a very important function that AIP could serve.