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Judea Pearl Named 81st Faculty Research Lecturer

The UCLA Academic Senate has elected Professor Judea Pearl, one of the nation's leading researchers in the fields of artificial intelligence and automated reasoning, as the 81st Faculty Research Lecturer.

Dr. Pearl, of UCLA's Computer Science Department, will deliver a lecture titled, "The Art and Science of Cause and Effect," on Tuesday, Oct. 29 at 3 p.m., in UCLA's Schoenberg Auditorium. Admission is free.

UCLA's annual faculty research lecture presents the university's most distinguished scholars to the public. The stated purpose is to accord these individuals the high recognition that is their due and to give faculty, students and citizens of the community an opportunity to understand the lecturer's scholarly achievements.

Dr. Judea Pearl regards paradoxes as "the magnifying glasses of deep principles." In 1965, he proved this point by contriving an apparent contradiction of Faraday's Law to discover new phenomena in superconductivity. In 1995, he dissolved Simpson's Paradox, a statistical illusion first noted a century earlier, and thus created a new method of processing cause-effect relationships. These ground-breaking achievements span a remarkable scientific career in superconductivity, advanced memory systems, pattern recognition, artificial intelligence and the art and science of causal thinking.

Pearl was born into a Hasidic merchant family which left Poland in 1924 to establish an orthodox farming community in Israel. During his army service, he became a devout kibbutznik, and was sent to train as a conductor at Haifa Music Conservatory. Although his first love was music -- he currently directs the Los Angeles Hebrew Choir -- Pearl opted to study electrical engineering at the Technion.

Pearl came to the United States to do graduate work in physics and electrical engineering at Rutgers and at the Polytechnic Institute of Brooklyn, where he received his Ph.D. in 1965. After early work on the electrical properties of blood in motion and on computer memory devices, Pearl launched the experiment which proved the existence of moving vortices in superconductors. This intriguing phenomenon allowed Pearl to convert the motion of a magnet to a steady electric voltage without changing magnetic flux, something Faraday's Law says is impossible. The discovery led to two patents and the David Sarnoff Outstanding Achievement Award.

After serving as director of research at Electronic Memory Inc., Pearl joined the

UCLA School of Engineering and Applied Science faculty in 1969. He quickly moved into artificial intelligence and pioneered the field of Heuristics -- the use of "rules-of-thumb" in automated problem solving. Four books, more than 150 technical papers, and the theses of seventeen doctoral students mark the path of his continuing research and teaching of artificial intelligence. The journal Artificial Intelligence has identified Pearl as "The Most Published Scientist" and author of "The Most Cited Paper" in the journal's 20-year history.

His most significant contribution in artificial intelligence has been the development of theoretical foundations for reasoning under uncertainty by using "belief networks," work described in his second book Probabilistic Reasoning in Intelligent Systems (1988). This book has shaped both the theory and practice of expert systems, Pearl demonstrates that incomplete knowledge can be represented by networks of local relationships and that local computations along the pathways of these networks can produce useful inferences. These capabilities are essential today when computers are asked to draw conclusions and make critical decisions while faced with incomplete information about highly complex situations.

Most recently, Pearl has developed a graphical method that greatly simplifies the problem of how cause-effect relationships are to be assessed from non-experimental observations. The primary reason for the long standing confusion over this problem, epitomized by Simpson's paradox, is that "answers depend on causal assumptions, and statisticians, by and large, are reluctant to discuss causal information openly" says Pearl. His method now enables researchers to articulate causal assumptions formally, join them with data, and deduce their implications with mathematical precision.

Pearl is the Director of the Cognitive Systems Laboratory in the Computer Science Department, a Fellow of the Institute of Electrical and Electronics Engineers and a Founding Fellow of the American Association of Artificial Intelligence. In 1995, he was elected to the National Academy of Engineering for "developing the foundations for reasoning under uncertainty.