Grand Challenge Problems in AI

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Given below are a set of longstanding challenges in the AI area that will be within technological reach in the next twenty years, and can be posed as realistic grand challenges.

WORLD CHAMPION CHESS MACHINE using commercially available hardware costing under $5K.

MATHEMATICAL DISCOVERY: discover a major mathematical result by a computer.

THE TRANSLATING TELEPHONE: develop a system in which a Japanese speaker can converse with, say, an English speaker in real time.

ACCIDENT-AVOIDING CAR.

READ A CHAPTER IN A COLLEGE FRESHMAN TEXT (SAY PHYSICS OR ACCOUNTING) AND ANSWER THE QUESTIONS AT THE END OF THE CHAPTER.

LEARN TO REPAIR A ROBOT ON MARS FROM OBSERVING A PERSON DOING THE SAME TASK ON EARTH.

95% SELF-REPLICATING SYSTEMS.

HUMAN LEVEL AI. Systems that simultaneously exhibit properties of intelligent systems: Learn from Experience, Use vast amounts of knowledge, Exhibit goal-directed behavior, Tolerate error and ambiguity, Communicate in natural language, and Operate in real-time

BIO:

Dr. Raj Reddy is the Herbert A. Simon University Professor of Computer Science and Robotics in the School of Computer Science at Carnegie Mellon University. He began his academic career as an Assistant Professor at Stanford in 1966. He has been a member of the Carnegie Mellon faculty since 1969. He served as the founding Director of the Robotics Institute from 1979 to 1991 and the Dean of School of Computer Science from 1991 to 1999.

Dr. Reddy's research interests include the study of human-computer interaction and artificial intelligence. His current research projects include spoken language systems; gigabit networks; universal digital libraries; and distance learning on demand. He is a member of the National Academy of Engineering and the American Academy of Arts and Sciences. He was president of the American Association for Artificial Intelligence from 1987 to 89. Dr. Reddy was awarded the Legion of Honor by President Mitterand of

France in 1984. He was awarded the ACM Turing Award in 1994. He is a member and co-chair of the President's Information Technology Advisory Committee (PITAC).

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