



From 1966 through 1972, the Artificial Intelligence Center at SRI International (then Stanford Research Institute) conducted research on a mobile robot system nicknamed "Shakey." Endowed with a limited ability to perceive and model its environment, Shakey could perform tasks that required planning, route-finding, and the rearranging of simple objects. Although the Shakey project led to numerous advances in AI techniques, many of which were reported in the literature, much specific information appears only in a series of previously relatively inaccessible SRI technical reports.

In 1969, the demonstrations of Shakey were collected in a 24-minute film **"SHAKEY: Experimentation in Robot Learning and Planning"** (91.7MB RealVideo). The possibilities of Computer Science and Artificial Intelligence caught the public's imagination. After an April 10, 1968, article in the New York Times about Shakey and two other robot efforts (MIT & Stanford), Life Magazine referred to Shakey as the "first electronic person" in 1970. In November 1970, the National Geographic Magazine also carried a picture of Shakey in an article on the present uses and future possibilities of computers.

Originally, Shakey was controlled by a SDS-940 computer acquired in 1966 with 64K 24-bit words of memory. Programmed in Fortran and Lisp, Shakey's problem solving was done in QA3. This was replaced by a "large" PDP-10 around 1969 with

192K 36-bit words of memory. STRIPS was then used for problem solving, with QA4 developed later. When the movie was made, Shakey's programs occupied over "300,000 36-bit words" (~1.35MB).

Shakey is now on display at the Computer History Museum in Mountain View, California.

[More images of Shakey](#)

### Proposals, Reports, and Publications

These publications cover six projects that involved Shakey and associated AI efforts.

1. [Application of Intelligent Automata to Reconnaissance](#) [March 17, 1966, to December 5, 1968].
2. [Research on Intelligent Automata](#) [August 7, 1968, to November 7, 1969].
3. [Research and Applications — Artificial Intelligence](#) [October 7, 1969, to October 7, 1970]
4. [Research and Applications — Artificial Intelligence](#) [October 8, 1970, to October 7, 1971]
5. [Artificial Intelligence — Research and Applications](#) [October 8, 1971, to October 9, 1973]
6. [Artificial Intelligence — Research and Applications](#) [October 10, 1973, to October 9, 1975]

A good overview of Shakey can be found in the [AIC Technical Note 323](#).

These reports are ordered from earliest to most recent.

- Rosen, C. A, Nilsson, N. J. and Adams, M. B. **A Research and Development Program in Applications of Intelligent Automata to Reconnaissance-Phase I**. Proposal ESU 65-1 Technical. See proposal ESU 65-117 and project 5953, January 1965. [[PDF](#), [Details](#)]
- Rosen, C. A., Nilsson, N. J. and Adams, M. B. **Application of Intelligent Automata to Reconnaissance**. SRI Proposal No. ESU 65-117. Leads to project 5853, December 1965. [[PDF](#), [Details](#)]
- Rosen, C. A., Nilsson, N. J. and Adams, M. B. **Application of Intelligent Automata to Reconnaissance**. Statement of Work for SRI Proposal ESU 65-117, December 1965. [[PDF](#), [Details](#)]
- Rosen, C. A. and Nilsson, N. J. **Application Of Intelligent Automata to Reconnaissance**, Technical Report . Stanford Research Institute, November 1966.  
Project 5953 Interim Report 1  
From the Nilsson archives – SHAKEY papers [[PDF](#), [Details](#)]
- Rosen, C. A. and Nilsson, N. J. **Application of Intelligent Automata to Reconnaissance**, Technical Report . Stanford Research Institute, March 1967.  
Project 5953 Interim Report 2  
From the Nilsson archives – SHAKEY papers [[PDF](#), [Details](#)]
- Rosen, C. A. and Nilsson, N. J. **Augmentation and Continuation of the Application of Intelligent Automata to Reconnaissance**. SRI Proposal ESU 67-36. Leads to project 7494, April 1967. [[PDF](#), [Details](#)]
- Artificial Intelligence Group, Applied Physics Laboratory, Stanford Research Institute. **A Plan for a Unified Program of Research in Artificial Intelligence at SRI**, Technical Note . AI Center, SRI International, 333 Ravenswood Ave, Menlo Park, CA 94025, Oct 1967. [[PDF](#), [Details](#)]
- Rosen, C. A. and Nilsson, N. J. **Application of Intelligent Automata to Reconnaissance**, Technical Report . Stanford Research Institute, December 1967.  
Project 5953 Interim Report 3  
From the Nilsson archives – SHAKEY papers [[PDF](#), [Details](#)]
- Nilsson, N. J., Raphael, B. and Wahlstrom, S. **Application of Intelligent Automata to Reconnaissance**, Technical Report . Stanford Research Institute, May 1968.  
Project 5953 Interim Report 4  
From the Nilsson archives – SHAKEY papers [[PDF](#), [Details](#)]
- Nilsson, N. J., Rosen, C. A., Raphael, B., Forsen, G., Chaitin, L. and Wahlstrom, S. **Application of Intelligent Automata to Reconnaissance**, Technical Report . Stanford Research Institute, December 1968.  
Project 5953 Final Report  
From the Nilsson archives – SHAKEY papers [[PDF](#), [Details](#)]
- Rosen, C. A. **Research on Intelligent Automata (August 1969 to August 1970)**. Preproposal Jan 3, 1969. See proposal ESU 69-68 and project 8259, January 1969. [[PDF](#), [Details](#)]
- Nilsson, N. J. **Research on Intelligent Automata**, Technical Report . Stanford Research Institute,

February 1969.

Project 7494 Interim Report

From the Nilsson archives – SHAKEY papers [[PDF](#), [Details](#)]

- Green, C. **Application of Theorem Proving to Problem Solving**, Technical Note 4. AI Center, SRI International, 333 Ravenswood Ave, Menlo Park, CA 94025, Mar 1969.  
Project 7494  
Presented at IJCAI 1969 [[PDF](#), [Details](#)]
- Nilsson, N.J. **A Mobile Automaton: An Application of Artificial Intelligence Techniques**, Technical Note 40. AI Center, SRI International, 333 Ravenswood Ave, Menlo Park, CA 94025, Mar 1969.  
SRI Project 7494  
IJCAI 1969 [[PDF](#), [Details](#)]
- Coles, L.S. and Green, C. **Chemistry Question-Answering**, Technical Note 9. AI Center, SRI International, 333 Ravenswood Ave, Menlo Park, CA 94025, Jun 1969.  
SRI Project 5494 [[PDF](#), [Details](#)]
- Green, C. **The Application of Theorem Proving to Question-Answering Systems**, Technical Note 8. AI Center, SRI International", 333 Ravenswood Ave, Menlo Park, CA 94025, Jun 1969.  
Project 7494. Stanford PhD Dissertation [[PDF](#), [Details](#)]
- Rosen, C. A., Nilsson, N. J., Rapahel, B. and Duda, R. O. **Research on Intelligent Automata**. SRI Proposal Costing ESU 69-68, June 1969. [[PDF](#), [Details](#)]
- Rosen, C. A., Nilsson, N. J., Raphael, B. and Duda, R. O. **Research on Intelligent Automata**. Proposal ESU 69-68 Part One–Technical Proposal, June 1969. [[PDF](#), [Details](#)]
- Coles, L. S., Duda, R. O., Garvey, T. D., Munson, J. H., Raphael, B., Rosen, C. A. and Yates, R. A. **Application of Intelligent Automata to Reconnaissance**, Technical Report . Stanford Research Institute, November 1969.  
Project 7494 Final Report  
From the Nilsson archives – SHAKEY papers [[PDF](#), [Details](#)]
- Duda, R.O. and Hart, P.E. **Experiments in Scene Analysis**, Technical Note 20. AI Center, SRI International, 333 Ravenswood Ave, Menlo Park, CA 94025, Jan 1970.  
SRI Project 8259  
Proceedings of the First National Symposium on Industrial Robots [[PDF](#), [Details](#)]
- Chaitin, L. J., Duda, R. O., Johanson, P. A., Raphael, B., Rosen, C. A. and Yates, R. A. **Research and Applications - Artificial Intelligence**, Technical Report . Stanford Research Institute, April 1970.  
Project 8259 Interim Scientific Report.  
From the Nilsson archives – SHAKEY papers [[PDF](#), [Details](#)]
- Rosen, C.A. **An Experimental Mobile Automaton**, Technical Note 39. AI Center, SRI International, 333 Ravenswood Ave, Menlo Park, CA 94025, Jul 1970.  
SRI Project 8259  
American Nuclear Society Eighteenth Conference on Remote Systems Technology [[PDF](#), [Details](#)]
- Duda, R.O. **Some Current Techniques for Scene Analysis**, Technical Note 46. AI Center, SRI International, 333 Ravenswood Ave, Menlo Park, CA 94025, Oct 1970.  
SRI Project 8259 [[PDF](#), [Details](#)]

- Duda, R.O. and Hart, P.E. **Use of the Hough Transformation to Detect Lines and Curves in Pictures**, Technical Note 36. AI Center, SRI International, 333 Ravenswood Ave, Menlo Park, CA 94025, Apr 1971. SRI Project 8259  
Comm. ACM, Vol 15, No. 1 [[PDF](#), [Details](#)]
- Fikes, R. E. **Monitored Execution of Robot Plans Produced by STRIPS**, Technical Note 55. AI Center, SRI International, 333 Ravenswood Ave, Menlo Park, CA 94025, Apr 1971. SRI Project 8973  
Paper accepted for presentation at the IFIP Congress '71, Ljubljana, Yugoslavia, August 23-28, 1971 [[PDF](#), [Details](#)]
- Raphael, B., Chaitin, L. J., Duda, R. O., Fikes, R. E., Hart, P. E. and Nilsson, N. J. **Research and Applications - Artificial Intelligence**, Technical Report . Stanford Research Institute, April 1971. Project 8973 Semiannual Progress Report 7 October 1970 to 31 March 1971  
From the Nilsson archives – SHAKEY papers [[PDF](#), [Details](#)]
- Fikes, Richard E. and Nilsson, Nils J. **STRIPS: A New Approach to the Application of Theorem Proving to Problem Solving**, Technical Note 43R. AI Center, SRI International, 333 Ravenswood Ave, Menlo Park, CA 94025, May 1971. SRI Project 8259 [[PDF](#), [Details](#)]
- Raphael, B., Duda, R. O., Fikes, R. E., Hart, P. E., Nilsson, N. J., Thorndyke, P. W. and Wilber, B. M. **Research and Applications - Artificial Intelligence**, Technical Report . Stanford Research Institute, December 1971. Project 8973 Final Report  
From the Nilsson archives – SHAKEY papers [[PDF](#), [Details](#)]
- Fikes, R.E., Hart, P.E., Nilsson, N.J. **Learning and Executing Generalized Robot Plans**, Technical Note 70. AI Center, SRI International, 333 Ravenswood Ave, Menlo Park, CA 94025, Jul 1972. SRI Project 1530 [[PDF](#), [Details](#)]
- Wilber, B. M. **A Shakey Primer**, Technical Report . Stanford Research Institute, 333 Ravenswood Ave, Menlo Park, CA 94025, November 1972. [[PDF](#), [Details](#)]
- Hart, P. E., Fikes, R. E., Garvey, T. D., Nilsson, N. J., Nitzan, D, Tenenbaum, J. M. and Wilber, B. M. **Artificial Intelligence - Research and Applications**, Technical Report . Stanford Research Institute, December 1972. Project 1530 Annual Technical Report  
From the Nilsson archives – SHAKEY papers [[PDF](#), [Details](#)]
- Nilsson, N. J. **Artificial Intelligence - Research and Applications Volume 2**, Technical Note . AI Center, Stanford Research Institute, May 1975. Project 3805 Progress Report 9 March 1974 - 31 March 1975  
From the Nilsson archives – SHAKEY papers [[PDF](#), [Details](#)]
- Nilsson, Nils J. **Shakey The Robot**, Technical Note 323. AI Center, SRI International, 333 Ravenswood Ave., Menlo Park, CA 94025, Apr 1984. [[PDF](#), [Details](#)]

## Successors



After an extended period of exploring other areas of Artificial Intelligence, the AI Center again turned to robots as a focus of significant AI challenges. Beginning in 1984, [Flakey](#) became the AIC's second-generation mobile robot. In 1994, Flakey, was featured on the PBS show *Scientific American Frontiers*, hosted by Alan Alda. Flakey had real-time stereo vision algorithms to distinguish and follow people, and the DECIPHER speech recognition system to respond to spoken commands. Flakey won prizes at the 1992 and 1993 AAAI Robot competitions.



The [Centibots](#) are a team of 100 autonomous robots (97 ActivMedia [Amigobot](#) and 6 ActivMedia Pioneer 2 AT). The goal of the project was to demonstrate 100 robots mapping, tracking, guarding in a coherent fashion during a period of 24 hours. The experiments were carried out successfully in January 2004.



©2016 SRI International 333 Ravenswood Avenue, Menlo Park, CA 94025-3493  
SRI International is an independent, nonprofit corporation. [Privacy policy](#)