

Movie Cubes

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The Movie Cube

The movie cube is a generalization of seismic data movies. Successive frames of a seismic data movie are planes in a three dimensional array of numbers. A movie is made by slicing through the data cube in some direction. Our movie program slices through the movie cube in the three Cartesian directions. It can display up to three orthogonal frames on the screen and animate one direction (Figures 1 and 2). Lines appear across the data showing where the frames intersect.

The rest of the movie program operates fairly much as described in SEP-32. The 22 screen options are entered, almost instantaneously, by typing a single key. The window function has been generalized to give sub-cubes of the dataset.

Technical Notes

The movie program structure gives the power to easily develop novel and reliable movie options. As mentioned in SEP-32, the concept of the *logical device* gives the movie program this power. In the movie program, this concept is used to simulate multiple filmloops and graphics screens (Figure 3). A logical device (1) allows multiple instances of the same device, (2) permits the addition of software functions to existing hardware functions, (3) isolates device dependent code, and (4) helps force consistency, reliability, and efficiency in the software. Most of the logical devices are implemented as clever data structures in the movie program (Figure 4).

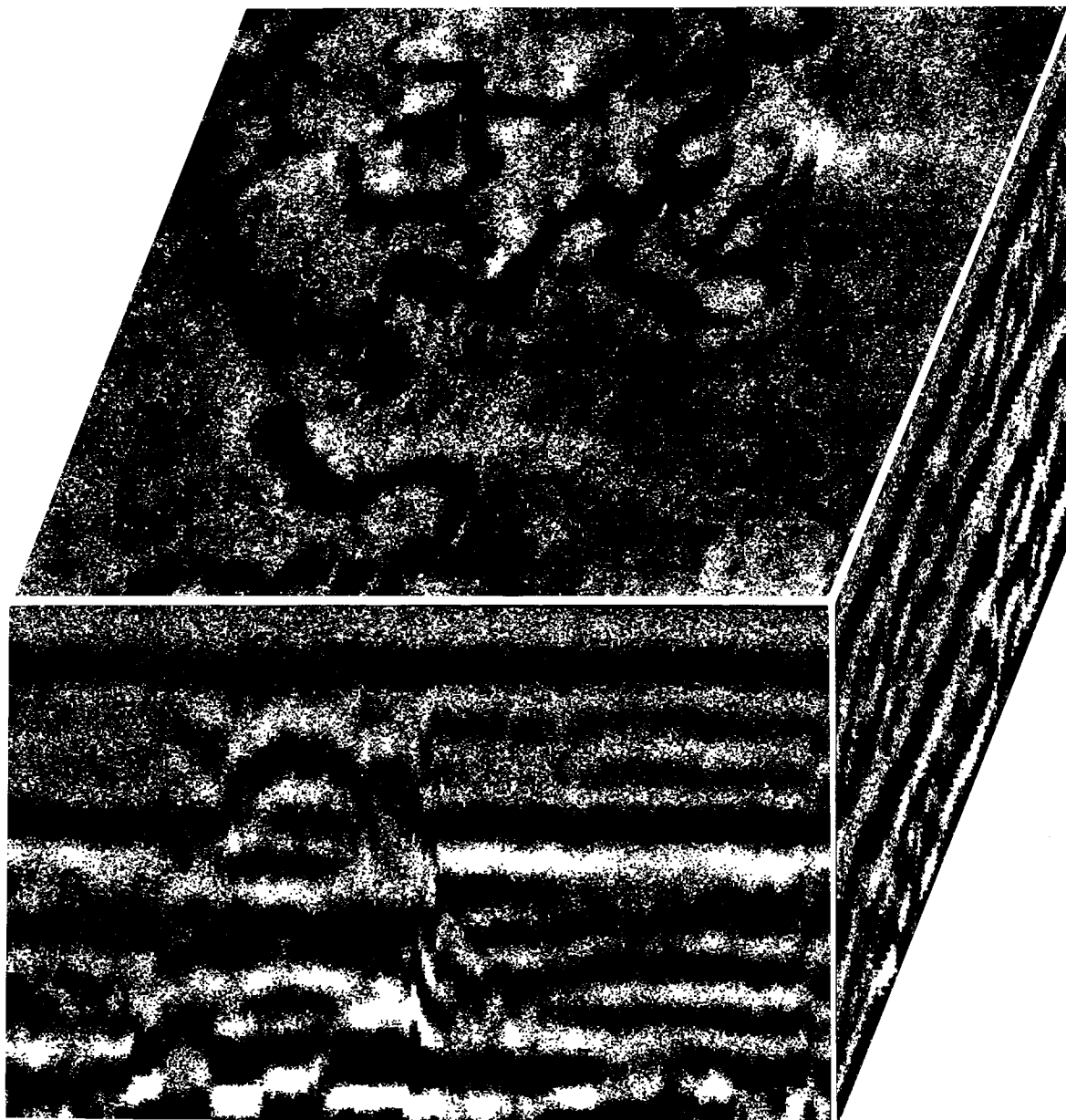


FIG. 1. Sample movie cube of the GSI Gulf of Thailand migrated 3D dataset. Survey lines were parallel to the front of the cube. A horizontal plan is about 7 kilometers square and .5 kilometers thick. It contains about 1 million data samples, which is about 1/16 of the original dataset (Geophysics, Feb. 1983). This cube can be animated in 22 different modes as described in figure 2.

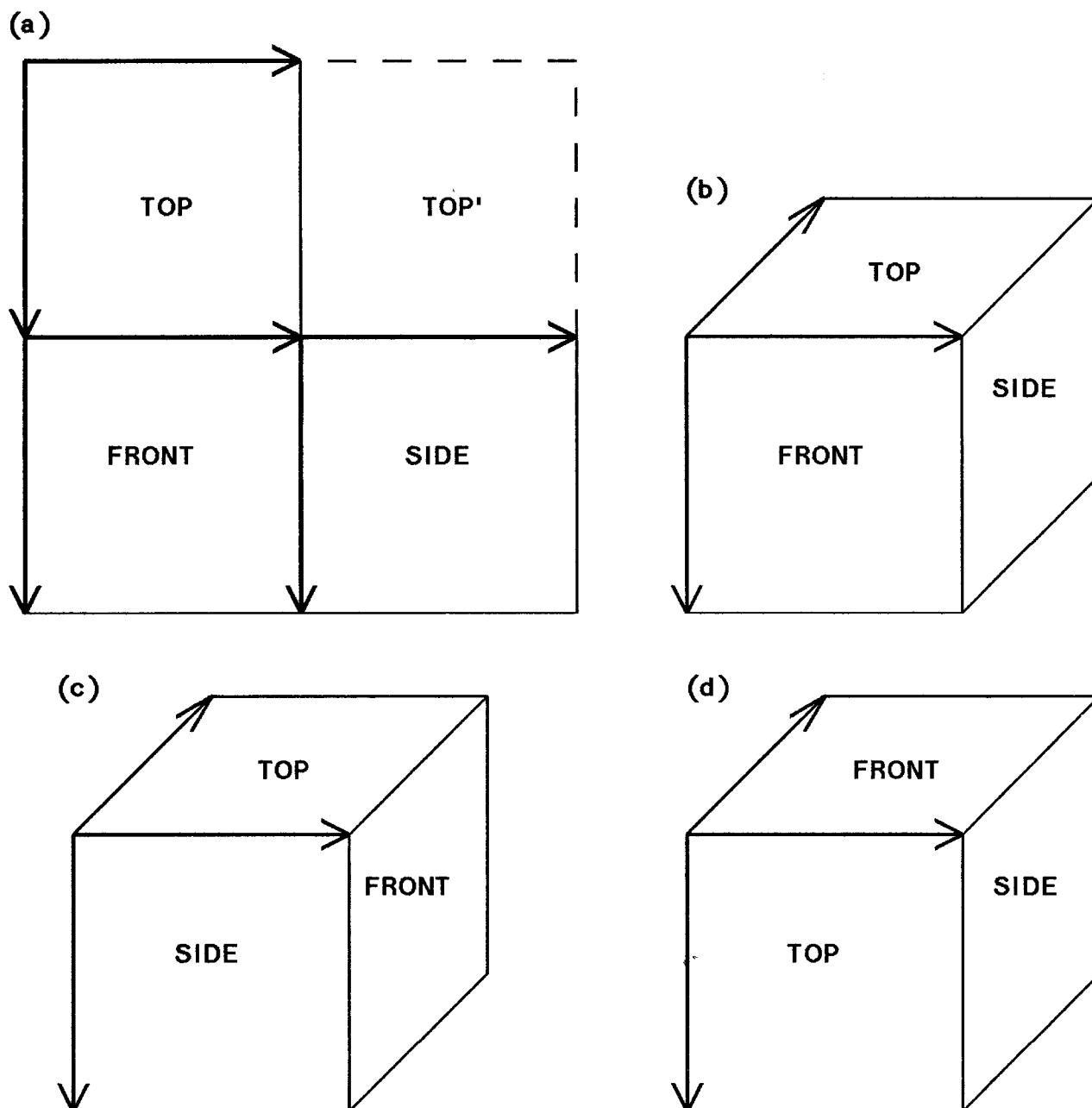


FIG. 2. The 22 screen options in our movie program include:
 Single frames of the plan view (a). [4]
 Each plan view (a) pair with one of the frames animated. [6]
 Plan view (a) triplets with one of the frames animated. [3]
 The front facing cube (b) with any side animated. [3]
 The side (c) and top facing cubes (d) with any side animated. [6]
 Axes increase in the direction shown.

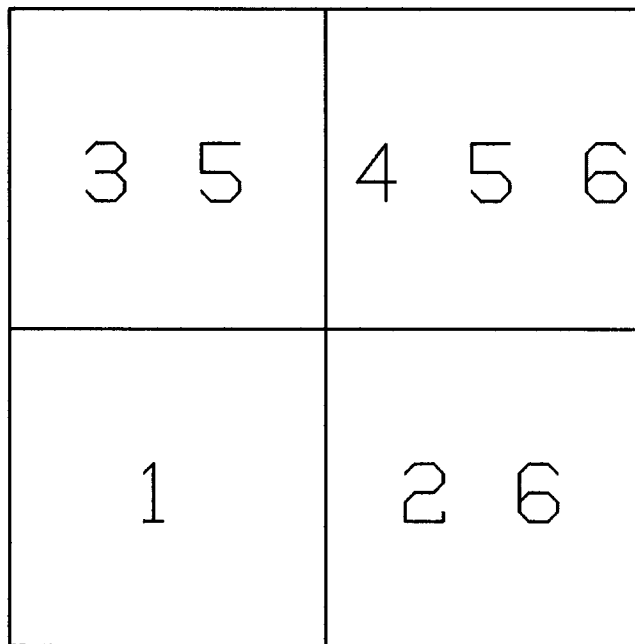


FIG. 3. These are the screen sub-frames composing the views of figure 1. Frames 1 through 4 make up the plan view (Figure 1a). Frame 5 is the top of the cube and frame 6 is the right side. Besides the the appropriate cross section, frames 5 and 6 also contain a triangle of background, and a triangle of each other's material where they overlap in quadrant 4.

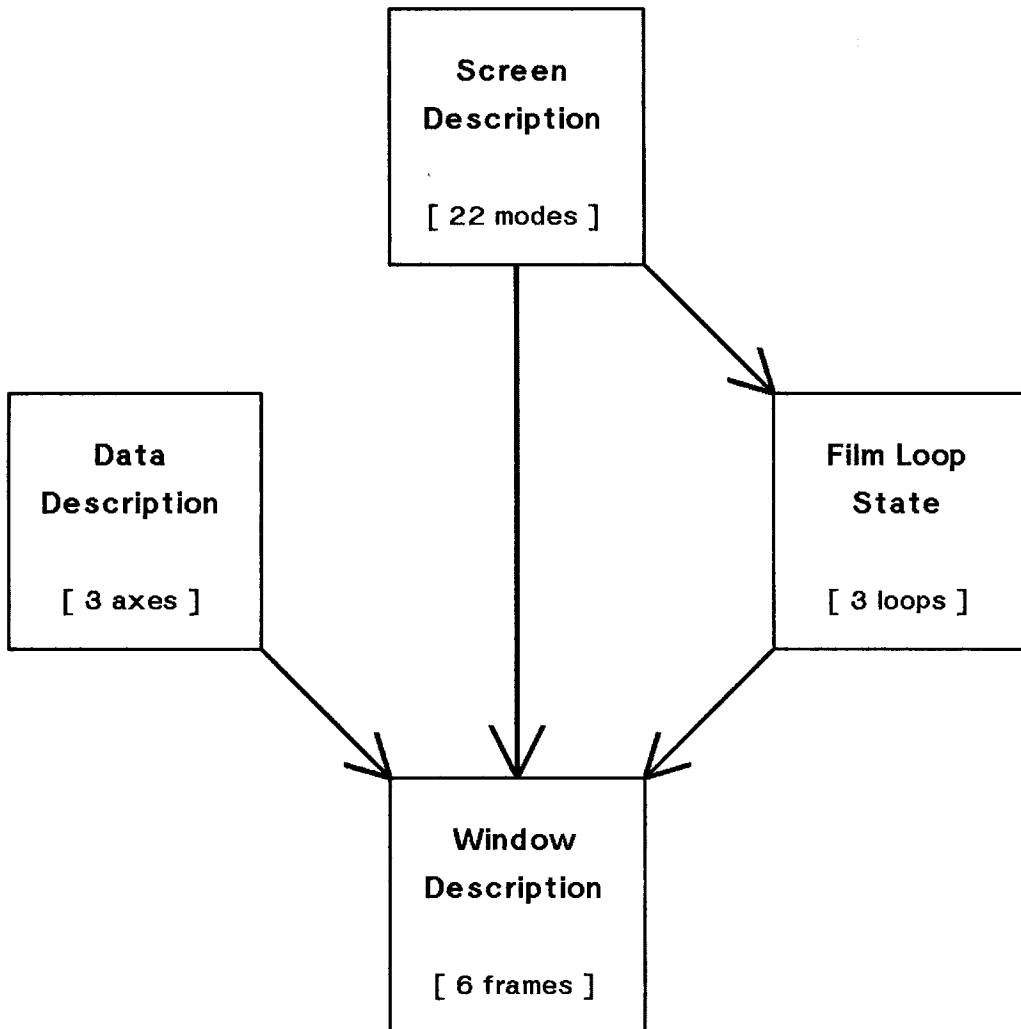


FIG. 4. This is a diagram of the logical devices and major data structures in the movie program. The screen description executive contains overall information about the 22 screen modes described in Figure 1. The movie program runs film loops in the three different Cartesian directions. A window manager is the workhorse of the movie program. It integrates information about data, screen, and film loop.

ENROLLMENT BY ACADEMIC PROGRAM

	Undergraduate	Graduate
Business	—	703
Earth Sciences	125	249
Education	—	500
Engineering	717	1,959
Humanities & Sciences	2,465	1,778
Law	—	492
Law-Business	—	23
Medicine	31	562
Major undeclared	3,229	—
Other programs	23	14
Post-doctoral scholars	—	485
Nonmatriculated	45	114

ETHNIC MINORITY GROUPS 1980-81

	Undergraduate	Graduate
Asian-American	442	241
Black	422	190
Hispanic	455	216
Native American	37	25

DEGREES AWARDED 1980-81

Bachelors	1,599
Advanced	2,436

RHODES SCHOLARS

42 elected since World War II.

MARSHALL SCHOLARS

22 elected since the first awards in 1954.

FOREIGN STUDENTS

In addition to students from all 50 states, Stanford's enrollment includes 1,967 foreign students from 91 countries. They constitute 4% of undergraduate, 27% of graduate, and 35% of postdoctoral enrollment.

GRADUATE FELLOWSHIP SUPPORT 1980-81

	Aid Granted	No. Students Receiving Aid
All Students	\$32,000,000	4,950
Humanities & Sciences	12,000,000	1,535
Graduate School of Business	1,452,000	450
Earth Sciences	1,426,000	210
Education	2,227,000	370
Engineering	11,391,000	1,722
Law	900,000	260
Medicine		
MD	1,685,000	285
Non-MD	919,000	118

6

7

Freshman Applications

Year	Number	% Admitted	Year	Number	% Admitted
1948	2,585	52	1966	7,700	25
1949	2,109	64	1967	8,051	25
1950	2,014	77	1968	8,200	26
1951	2,016	85	1969	9,320	22
1952	2,674	64	1970	9,880	23
1953	2,912	62	1971	9,228	26
1954	3,508	56	1972	8,748	28
1955	3,703	54	1973	9,308	26
1956	4,467	46	1974	9,373	27
1957	4,766	41	1975	9,730	25
1958	4,623	47	1976	10,007	25
1959	4,740	47	1977	9,900	25
1960	6,546	31	1978	10,920	23
1961	6,091	34	1979	11,787	21
1962	6,561	30	1980	12,731	19
1963	6,447	31	1981	14,029	18
1964	7,103	28	1982	13,889	18
1965	7,689	25	1983	14,500 (est)	17 (est)