

resumé

Donald E. McArthur
105 Tompkins St.
Cortland, New York 13045

Telephone 607-756-7383
607-747-4094

Personal: Born-Jan. 19, 1938 Holdrege, Nebraska

Education: Ph.D. Theoretical Physics Univ. of Nebraska 1967
B. S. Physics and Math. Univ. of Nebraska 1959

Employment:

1974 Visiting Associate Professor of Physics
SUNY-Binghamton

1970-1973 Associate Professor of Physics
SUNY-Cortland

1967-1970 Assistant Professor of Physics
SUNY-Cortland

1964-1967 Research Associate
University of Saskatchewan
Saskatoon, Saskatchewan

1962-1964 Instructor of Physics
University of Nebraska

1959-1962 N.S.F. Fellow
University of Nebraska

Military Service: None

Computer Experience:

Numerical solution of two-point boundary value
problems.

Electron beam optics calculations.

Languages: Fortran, APL, Burroughs 205- machine language

Interests: Heuristic Programming, Digital Electronics,
Video systems, Electronic music.

1976 Designed basic system for MacArthur/Schier
Digital Image Generator
The Vasulkas, Buffalo, New York

1976 Designed and partially constructed the Spatial and
Intensity Digitizer
Experimental Television Center - Binghamton

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The Don McArthur Spatial and Intensity Digitizer (SAID)

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The Spatial and Intensity Digitizer or "SAID" ~~was an~~ arose from an early attempt at creating a low cost video analog to digital converter (A/D). In 1976 no monolithic silicon A/D converters existed, and their cost was outside the range of most video art budgets. As this component was basic to any digital video processing, a 6 bit A/D converter was attempted. An A/D converter of 4 bits or less was commonly constructed using a string of high speed comparators, but greater than 4 bits was difficult to perfect.

Basic to an A/D converter is the sample and hold amplifier, to pick out a sample of the video voltage, and hold its value till it is converted into digital form. The conversion from analog voltage to a digital code is next, followed by an digital encoding to develop a binary output number. The output of the binary encoder is often "latched" to hold a stable value. The internal conversion element speed often determined the highest clock speed possible. A horizontally locked oscillator was available to slow down the clock rate, till the conversion was stable. This was generalized to allow wide variation of oscillator speed. The output of the A/D converter was fed to a companion Digital to Analog converter of 6 bit resolution.

The result of the circuit was to "digitize" the video signal into numerous digital "thresholds" and arrange them as vertical strips. The spacing or width of the vertical strips of video was adjusted by an oscillator knob. Switch selection of the number of digital bits, was also available. This would be an early digital example of the "posterize" function (the bit selection), and a stripes are the horizontal component of the "mosaic" function of current digital video devices.

Experimental Television Center Ltd.
Program: Systems Approach to Video Art
Don McArthur

Attachment

Don McArthur has been working at the Center for about six months. In this time he has designed and partially constructed the Spatial and Intensity Digitizer which is considered by several artists to be a major step forward in the development of systems for the artist. A videotape will be sent to the Council under separate cover which illustrates the machine in operation. His extensive background in the area of theoretical physics and his work with computers as well as his open and creative approach to systems design make him a unique and extremely valuable contributor to the development of video art tools. In the time that he has been with us he has had a powerful influence on the directions of the Center and has encouraged us to carefully consider the needs of the working video artist. We have long felt that the artist needs innovative tools with precise control, and Don has the knowledge and interest to design these systems at low cost. As indicated in the Center's proposal one of our main directions for 1975-76 will be the development of new video systems and the interface of computer control with image processing equipment such as the two types of colorizers available at the Center, the Paik/Abe Synthesizer and the Jones Gray Level Voltage Controlled Colorizer. As these tools are developed they will be made available to working artists at the Center and the information will be distributed to interested groups and individuals. The working relationship of Don McArthur, Walter Wright, Steina and Woody Vasulka, Nam June Paik and David Jones which the Center hopes to support will prove to be a vital influence on the evolution of the art. Don McArthur is central to this productive relationship, and we ask the Council to help support him. It should be noted that the Center intends to seek further support from other foundations, particularly the Rockefeller Foundation, for the support of Mr. McArthur's projects.