Grigg, George, and Carnochan, John, Papers

George Grigg and John Carnochan Papers

circa 1960s-2015

Title Statement

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Descriptive Summary

Unit ID
Ms.2017.006

Unit Date
circa 1960s-2015

Language
The materials in the collection are in English.

Abstract
This collection includes documents related to the production and dissemination of George Grigg's and John Carnochan's computer-animated film, produced while students at Virginia Tech from 1969 through 1970 using FORTRAN.

Creator
Grigg, George C.

Creator
Carnochan, John

Extent
3.52 Cubic Feet 4 boxes

Repository
Special Collections and University Archives, Virginia Tech

Administrative Information

Conditions Governing Access

The collection is open for research. The 16mm film reels are not available for viewing, but the DVD of the restored film is available for viewing.

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Source of Acquisition

The George Grigg and John Carnochan Papers were donated to Special Collections and University Archives in 2016.

Processing Information

The processing, arrangement, and description of the collection was completed in February 2017.

Preferred Citation

Researchers wishing to cite this collection should include the following information: [identification of item], [box], [folder], George Grigg and John Carnochan Papers, Ms2017-006, Special Collections and University Archives, Virginia Tech, Blacksburg, Va.

Biographical and Historical Note

From 1969 to 1971, George Grigg and John Carnochan made animated films using computer-drawn images, while students at Virginia Tech's College of Architecture and Urban Studies (CAUS) in the Inner College. The Inner College was a program for invited upper level architecture students in which the students got to choose their own area of interest for study under Professor Olivio Ferrari.

In 1969, Carnochan began sketching ideas for using a polygon on many scales for multiple potential uses, such as for housing. The polygon developed as an elaboration of the space surrounding a cube, which in turn enlarged into a a solid polyhedron with 26 faces. This conceptual polyhedron design was referred to by the Inner College students as "The Element".

Carnochan started with a cardboard model, held together with tape, that over time he manipulated to change its size and shape as well as dimensions. Additional models of different materials, including balsa wood and Plexiglass, were made and photographed. Grigg came up with the idea of creating a computer drawing, enabling a view inside the space.

Before transferring to VPI in 1967, Grigg majored in physics at a university in Ohio, where he learned FORTRAN programming. While at VPI, Grigg also took a computer graphics class and independent study with adjunct professor Waltner Messcher.

Using Virginia Tech's IBM 360 computer, the largest in Virginia at the time, Grigg programmed in FORTRAN using punch cards. Grigg and Carnochan filmed the drawings on a 16mm camera, shooting one frame at a time and moving the drawings one degree of rotation per frame. At 24 frames per second, the first film required approximately 1440 individual drawings. Actual filming required shooting one computer drawing at a time. They filmed at night in the basement of the High School Building, and a small lab in northern Virginia developed and edited the film. In the first movie, the module rolled forward rotating on all three axes, beginning far away and ending in the foreground exactly in the middle of the screen.

After viewing the first film, Professor Ferrari asked Grigg to teach students to program and draw as part of their design class. In order to program, the College received its own punch card machine.

George and John continued making computer movies. Later movies became more complex. The film "Finite State Machines" was the longest and most challenging. As part of exploring and researching the geometry, a whole family of more complex forms was computer animated demonstrating not only the deformation but the geometrical packing. The computer animation was making possible views that were simply not possible to achieve any other way. John had modified the original cardboard model by making the square faces open instead of solid. That led to the discovery that if the square faces were not solid, the model could collapse onto itself. The edges of the rectangles could be made to touch each other to form four prism "legs" extending from a solid tetrahedron in the center. If the proportions of the sides were 1: 1.41: 1, the triangles of the diagonally opposite corners would come together, forming a collapsed "crown" that could form a joint

between two other non-collapsed modules.

In January 1969 George joined the Society of Amateur Cinematographers and he and John entered the movie in a computer film competition in Los Angeles. This was the first showing of the film outside of VPI. The film did not win a prize, but Grigg and Carnochan also learned about the Association for Computing Machinery and entered their 2nd Annual Computer and Music Exhibition in August 1969. (This exhibition has now become ACM Siggraph, the largest computer graphics exposition and conference held annually in California.) The movie was shown at the 1970 annual convention of the Virginia Society of Architects. It was also shown to several mathematics clubs at various Virginia state colleges and one in Kentucky. The same year the Inner College also built a large scale module out of aluminum angles to serve as the notice board for Tech Festival, an annual showcase for interested businesses and students to get acquainted with each other.

After graduating from Virginia Tech, Grigg taught in the Foundation Division of the College of Architecture for one year and then went into the practice of architecture (with occasional detours into teaching). The majority of his architectural projects focused on healthcare facilities. He retired in 2010.

Carnochan pursued a film career, editing a number of documentaries, live action features and TV shows. He returned to animation during the renaissance at Disney, where he edited *The Little Mermaid* and *Beauty and the Beast*. Subsequently, he edited the computer-animated films *Ice Age* and *Robots*. He lives in Los Angeles and continues to work in the U.S. and internationally, primarily in animation.

An extended history and information about the film is in Box 1, Folder 1.

Scope and Content

This collection includes documents related to the production and dissemination of George Grigg's and John Carnochan's computer-animated film, produced while students at Virginia Tech from 1969 through 1970 using FORTRAN. The papers also relate to a computer class Grigg taught after creating the film and include printed slides for a presentation about the film at VT for the 50th anniversary of the College of Architecture and Urban Studies (CAUS). There is a DVD and 16mm film reels of the animation, along with story boards, 3D models, photographs, correspondence, and more. The first folder of box 1 contains Grigg's and Carnochan's history of the film and description of the process.

Keywords

Architecture -- Computer-aided design
FORTRAN (Computer program language)
Science and Technology
Students and alumni
University History
Virginia Polytechnic Institute and State University. College of Architecture (1974-1978)
Virginia Polytechnic Institute (1944-1970)
Virginia Polytechnic Institute and State University (1970-)
Virginia Polytechnic Institute. College of Architecture

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Arrangement

The collection is arranged according to the creator's original order and size.

Description of Subordinate Components

John Carnochan and George Grigg's description of their 1969-1970 animated films using computer-drawn images

Unit Date 2015-04

box-folder 1 (box)

Container 1 (folder)

Printouts about computer punch cards
Unit Date 2013
box-folder 1 (box)
Container 2 (folder)

Reels of 16mm film (A+B roll, printed film, restored film) with notes by John Carnochan
Unit Date 1969-1970
box 2

DVD of film
Unit Date 2014
box 2

Eight mat board models of the element
box 4

One model of the void formed when stacking eight elements
box 3

Assorted black and white photos of some computer-drawn images produced during exploration of the element
box 2

Assorted black and white photos of mat board models of the element and the void
box 2

Assorted black and white photos of wire frame models of the element
box 2

Original computer drawing of elements progressing from closed to open and back to closed positions
box 2

Series of original computer drawings showing the void progressing from closed to open positions
box 2

Series of original computer drawings showing the element collapsing into the crown
box-folder 1 (box)
Container 3 (folder)

Printout of NASA technical report 19700023358, "FORTRAN Subroutine for Rotation of Three-Dimensional Line Figures and authorization for its public use"
Unit Date 1970
box-folder 1 (box)
Container 4 (folder)

A computer punch card
box-folder 1 (box)
Container 5 (folder)

Two black and white photos of a key punch machine
box-folder 1 (box)
Container 5 (folder)

Original printouts of some of the computer programs used to plot the images for the film
Unit Date 1969
box-folder 1 (box)
Container 6 (folder)

Story board for a computer film
box 2

Original correspondence and other documents relating to making and exhibiting the films
Unit Date 1969-1971
box-folder 1 (box)
Container 7 (folder)

Letter from Glyn H. Jones of Burroughs Corporation for the Association for Computing Machinery inviting interested persons to exhibit materials at the Second Computer Art and Music Festival to be held in Las Vegas, August 26-28, 1969
Unit Date 1969-05-29
box-folder 1 (box)
Container 7 (folder)

"AC Movie News: Official Publication of the Society of Amateur Cinematographers," which lists George Grigg as a member and his membership card
Unit Date 1969-12
box-folder 1 (box)
Container 7 (folder)

Letter from Jerry Upham of Synergistic Cybernetics Incorporated to George Grigg asking for information about Modular Living Spaces and for the input, output, and program listings (no programs provided)
Unit Date 1969-07-09
box-folder 1 (box)
Container 7 (folder)

Letter from Duncan R. Stuart, Professor of Design at North Carolina State University, to George Grigg asking for more information about the element and the film
Unit Date 1969-10-02
box-folder 1 (box)
Container 7 (folder)

Letter from Margaret Akermark, Associate Director Department of Films, The Museum of Modern Art responding to George Grigg's request for information about John Whitney's films
Unit Date 1969-10-08
box-folder 1 (box)
Container 7 (folder)

Letter from Glyn H. Jones of Burroughs Corporation to George Grigg informing him that the film had been shown "at several functions in the L.A. area" and was being returned to him
Unit Date 1969-10-13

box-folder 1 (box)
Container 7 (folder)

Letter from John Carnochan to George Grigg regarding expenses for processing the films
Unit Date 1971-07-08
box-folder 1 (box)
Container 7 (folder)

Letter from John Carnochan to George Grigg regarding additional expenses for processing the films
Unit Date 1971-08-17
box-folder 1 (box)
Container 7 (folder)

Invoices for film processing
Unit Date 1971
box-folder 1 (box)
Container 7 (folder)

Voucher for talk at University of Kentucky
Unit Date 1971
box-folder 1 (box)
Container 7 (folder)

George Grigg's course outline and handouts from computer graphics class for second year architecture students
Unit Date 1970-1971
box-folder 1 (box)
Container 8 (folder)

George Grigg's library of subroutines used in the computer graphics class for second year architecture students
Unit Date 1971-03
box-folder 1 (box)
Container 9 (folder)

George Grigg's annotated speaker's presentation to Virginia Tech's College of Architecture and Urban Studies (CAUS)
Unit Date 2013-04
box-folder 1 (box)
Container 10 (folder)

Printout of George Grigg's PowerPoint presentation with speaker's notes from VT CAUS talk
Unit Date 2013-04
box-folder 1 (box)
Container 11 (folder)

Printout of George Grigg's PowerPoint presentation, slides only from VT CAUS talk
Unit Date 2013-04
box-folder 1 (box)
Container 12 (folder)

Background information

Unit Date 1960s-1973

box-folder 1 (box)

Container 13 (folder)

"The Next Horizon" by Charles Burchard, FAIA, published in the AIA Journal

Unit Date 1973-10

box-folder 1 (box)

Container 13 (folder)

"Change in Space-Defining Systems" by Myron A. Guran, published in General Systems, the Yearbook for the Society for General Systems Research

Unit Date 1969

box-folder 1 (box)

Container 13 (folder)

Order in Space by Keith Critchlow

Unit Date 1969

box-folder 1 (box)

Container 13 (folder)

The White Book text by Charles Burchard, layout by Olivio Ferrari, Herbert Kramel, and Jerry Lawrence

Unit Date circa 1960s

box-folder 1 (box)

Container 13 (folder)