Project #: B-16-603
Center #: 10/24-6-R8082-0A0
Contract#: AGMT DTD 940307
Prime #: 
Subprojects ?: N
Main project #: 
Project unit: MULTIMEDIA
Project director(s): SINCLAIR M

Sponsor/division names: ACOG ATL COMM FOR OLYM GAMES / ATLANTA, GA
Sponsor/division codes: 500 / 265

Award period: 931001 to 931101 (performance) 940430 (reports)

Sponsor amount
Contract value 8,075.00
Funded 8,075.00
Cost sharing amount 0.00

Does subcontracting plan apply ?: N

Title: ACOG SPORTS ANIMATION

PROJECT ADMINISTRATION DATA

OCA contact: Jacquelyn L. Tyndall 894-9820
Sponsor technical contact 
LESLIE MCCOY (404)224-1996 
Sponsor issuing office 
DARLENE ROBINSON (404)224-1381

ATLANTA COMMITTEE FOR THE OLYMPIC GAMES
250 WILLIAMS ST., SUITE 6000
P.O. BOX 1996
ATLANTA, GA 30301-1996

ONR resident rep. is ACO (Y/N): N
N/A supplemental sheet
GIT X

Administrative comments - INITIATION OF PROJECT. INTELLECTUAL PROPERTY AGREEMENT ON FILE.
GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION

NOTICE OF PROJECT CLOSEOUT

Closeout Notice Date 12/23/94

Project No. B-16-603__________ Center No. 10/24-6-R8082-0A0_

Project Director SINCLAIR M__________ School/Lab MULTIMEDIA____

Sponsor ACOG ATL COMM FOR OLYM GAMES/ATLANTA, GA__________

Contract/Grant No. AGMT DTD 940307__________ Contract Entity GTRC

Prime Contract No. ____________________________

Title ACOG SPORTS ANIMATION__________________________

Effective Completion Date 931101 (Performance) 940430 (Reports)

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<tr>
<td>Final Report of Inventions and/or Subcontracts</td>
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Comments ____________________________________________

Subproject Under Main Project No. _________________

Continues Project No. __________________________

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Final Report

Atlanta Committee for the Olympic Games Sport's Animations

Team Handball, Field Hockey

June 1994

Michael J. Sinclair, Senior Research Engineer
Brian D. Jones, Research Engineer
Multimedia Technology Laboratory
Georgia Institute of Technology
400 10th Street, N.W.
Atlanta, Georgia 30332-0130
SUMMARY

The Atlanta Committee for the Olympic Games (ACOG) requested the Multimedia Technology Laboratory (MmTL) capture the motion and create the animation of the offensive and defensive moves for the sports of Field Hockey and Team Handball.

The project was accomplished through the use of a PEAK Performance Technologies' system and the Georgia Tech Multimedia Technology Lab's Motion iNTeractive (MiNT) program. The PEAK system was used at Georgia State University to capture various strategic athletic motions. These motions were then digitized and transferred to the MiNT software which was used to visualize 3D data obtained from the PEAK software.

The motion capture process involved the use of a two camera Peak system provided by Georgia State University's Biomechanics Laboratory. The two cameras were separated by an angle of approximately 120 degrees with respect to the motion capture area. In order to produce accurate 3D data, a calibration frame was used to find one camera's position with respect to the other.

Once the setup was complete, the athletes' actions were captured on SVHS tape. A total of 13 moves were captured, five offensive handball moves, two defensive handball, and six field hockey. In order to improve the quality of the animations, each move was captured 4 times and the best of these four was digitized to produce 3D data. The digitizing process entailed the use of a frame accurate SVHS player in conjunction with PEAK hardware and software. Each field was displayed using a video capture board and the position of the athletes joints were degitized. Once both camera views were digitized, the data was run through a DLT which was established through the digitization of the calibration frame. This produced the 3D data which was then run through a Butterworth filter for smoothing. The filtered 3D data was then imported into MiNT.
The 3D data points were then read into MiNT, which was developed by the Multimedia Lab and Mr. Frank Vitz for the 3D visualization of motion. An articulated model of the human body was assigned to these data points by defining an axis along which each body part must lie and then orienting each body part with respect to another data point. For example, the upper arm of the model was aligned along the axis between the shoulder joint and the elbow and then oriented such that the wrist joint controlled its rotation about this axis.

Once the body parts had been assigned and oriented, the motion was played back and finally scan-converted to produce the final product, an "in-line" video tape of the animated motions.

These video tapes were reproduced and distributed to various schools across the United States in an effort to assist coaches with their athletic programs. The process developed producing this project will be utilized in future projects to assist coaches in potentially all sports.