

# Biomechanical Integration for Sports Analysis



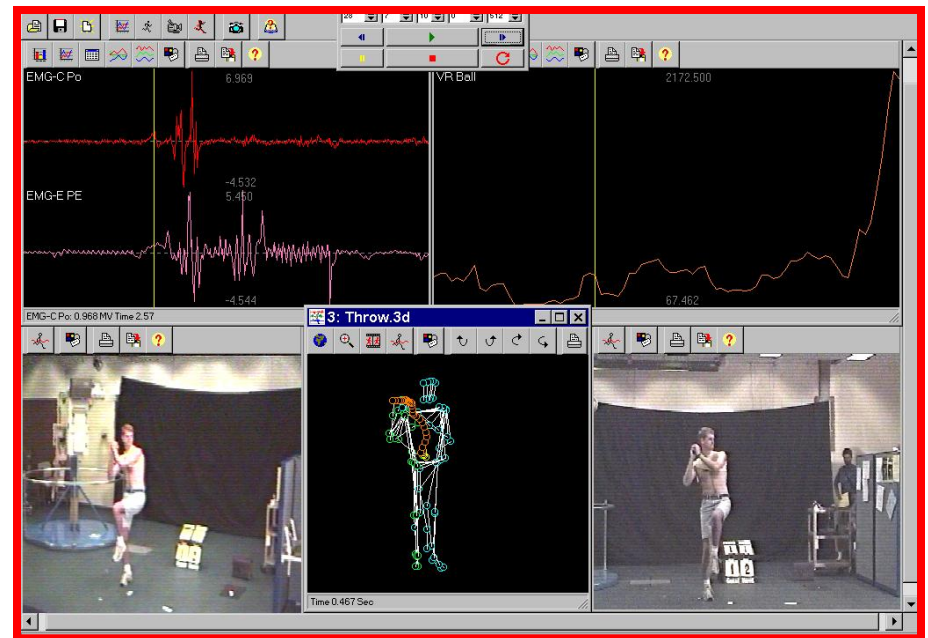
Gideon Ariel<sup>2</sup>, Alfred Finch<sup>1</sup>, Jan Brönd<sup>2</sup>, and Ann Penny<sup>2</sup>

<sup>1</sup>Indiana State University, Terre Haute, Indiana, United States

<sup>2</sup>Ariel Dynamics, San Diego, California, United States

# Hardware

- Main Computer System
- Workstations
- Capture Card
- Network
  - Intranet
  - Internet

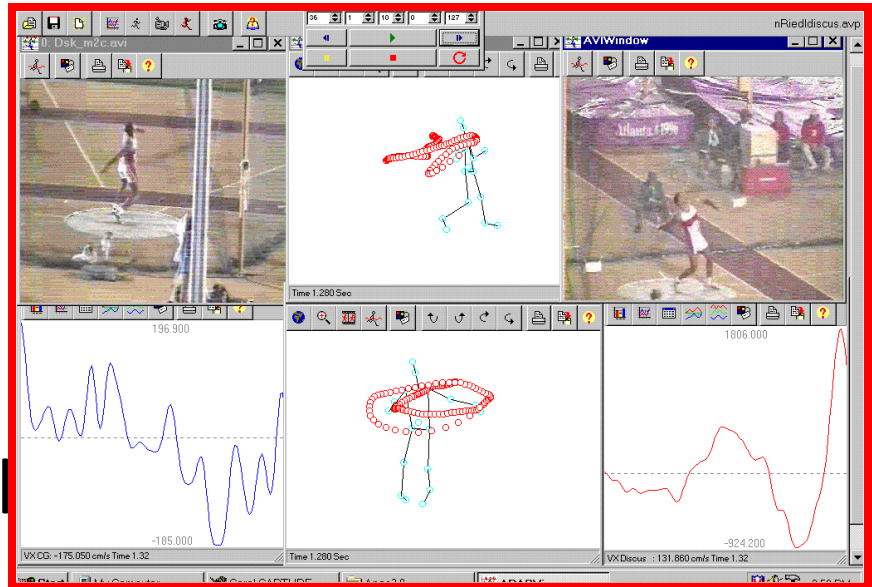


# Software Integration

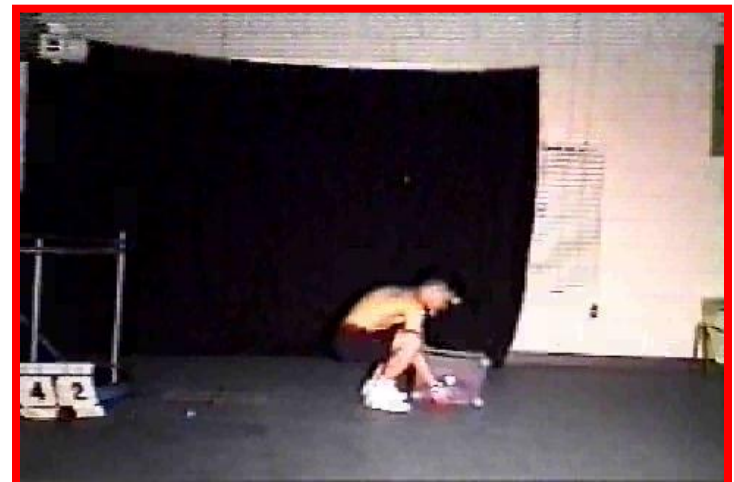
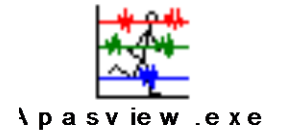


# Software Integration

- Capturing
- Digitizing
  - Locally
  - Net Digitizing
- Transformation
- Filtering
- Kinematics Results Display
- Kinetic Results Display

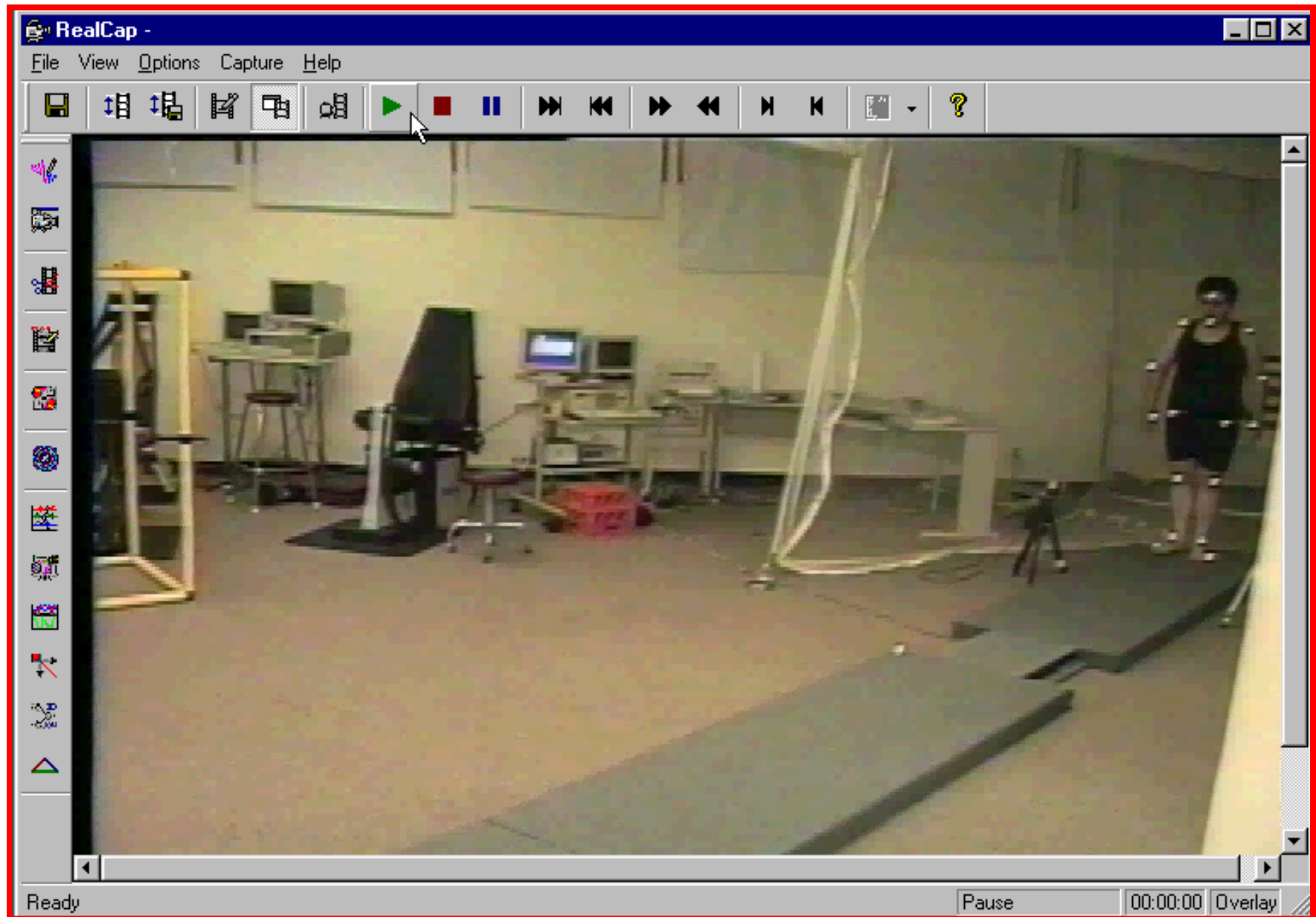


# Video Recording

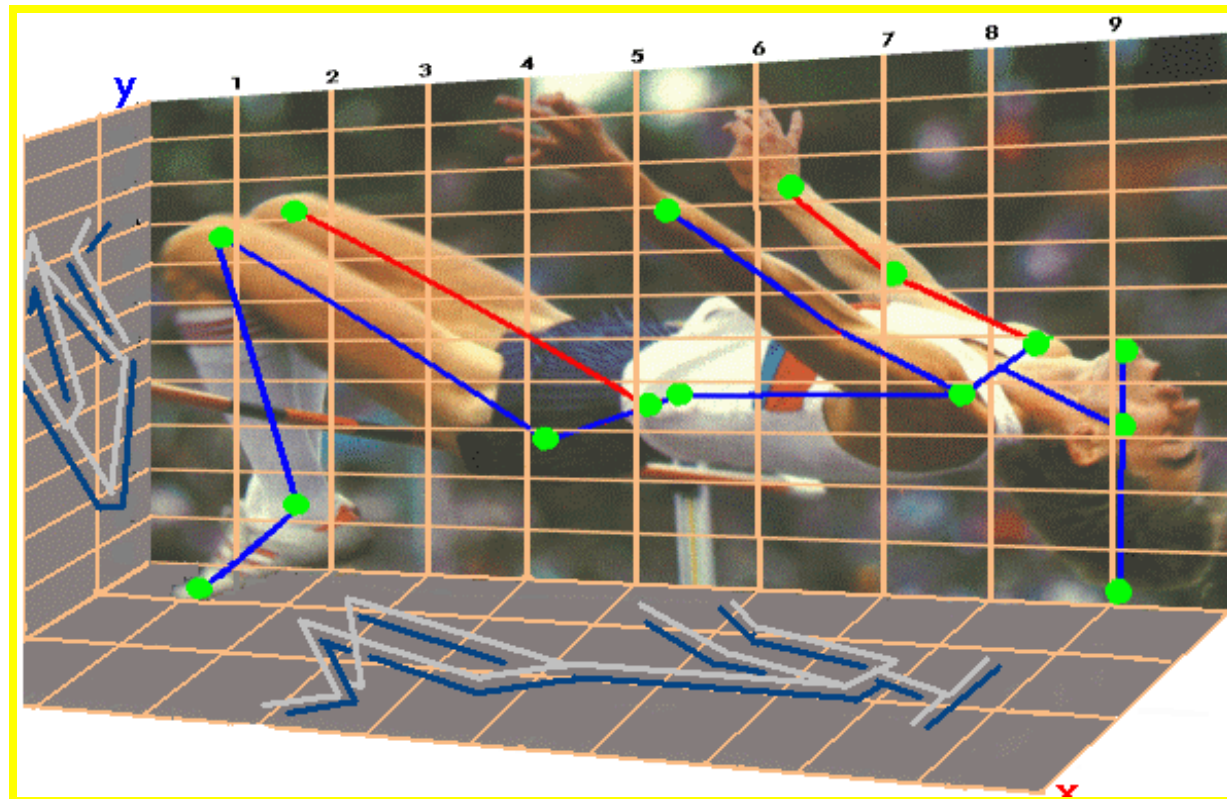




# Video Capturing

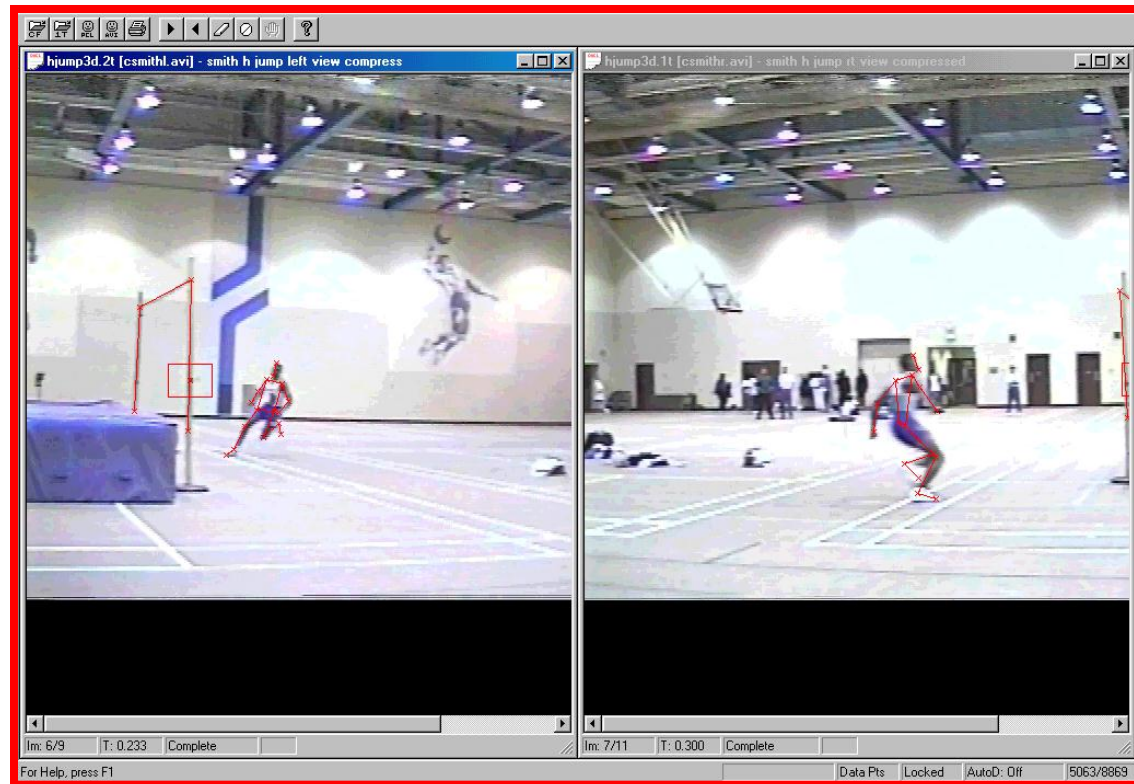


# Digitizing



# Digitizing

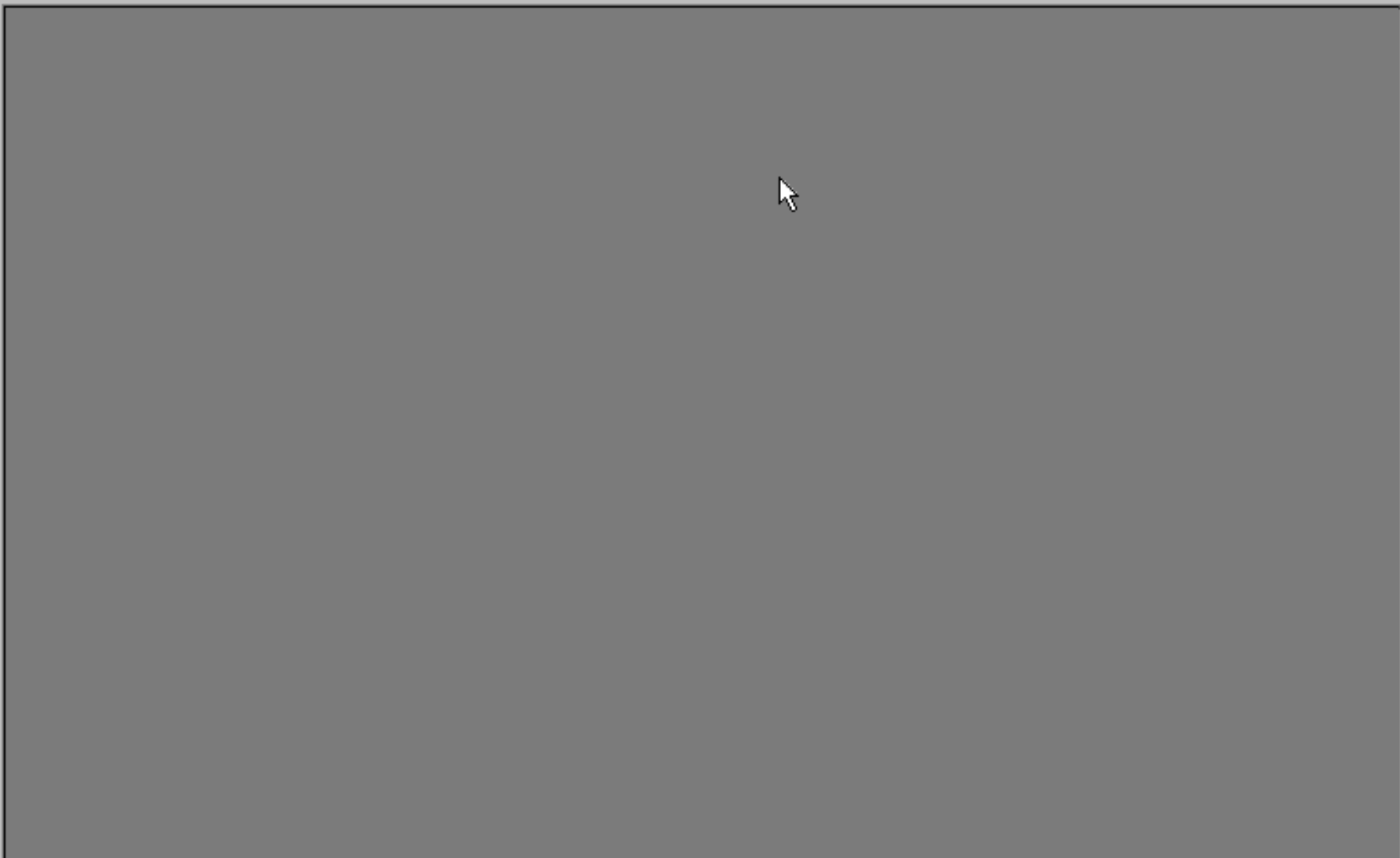
- Manually
- Automatically





APAS 4 Screen Digitizing Application

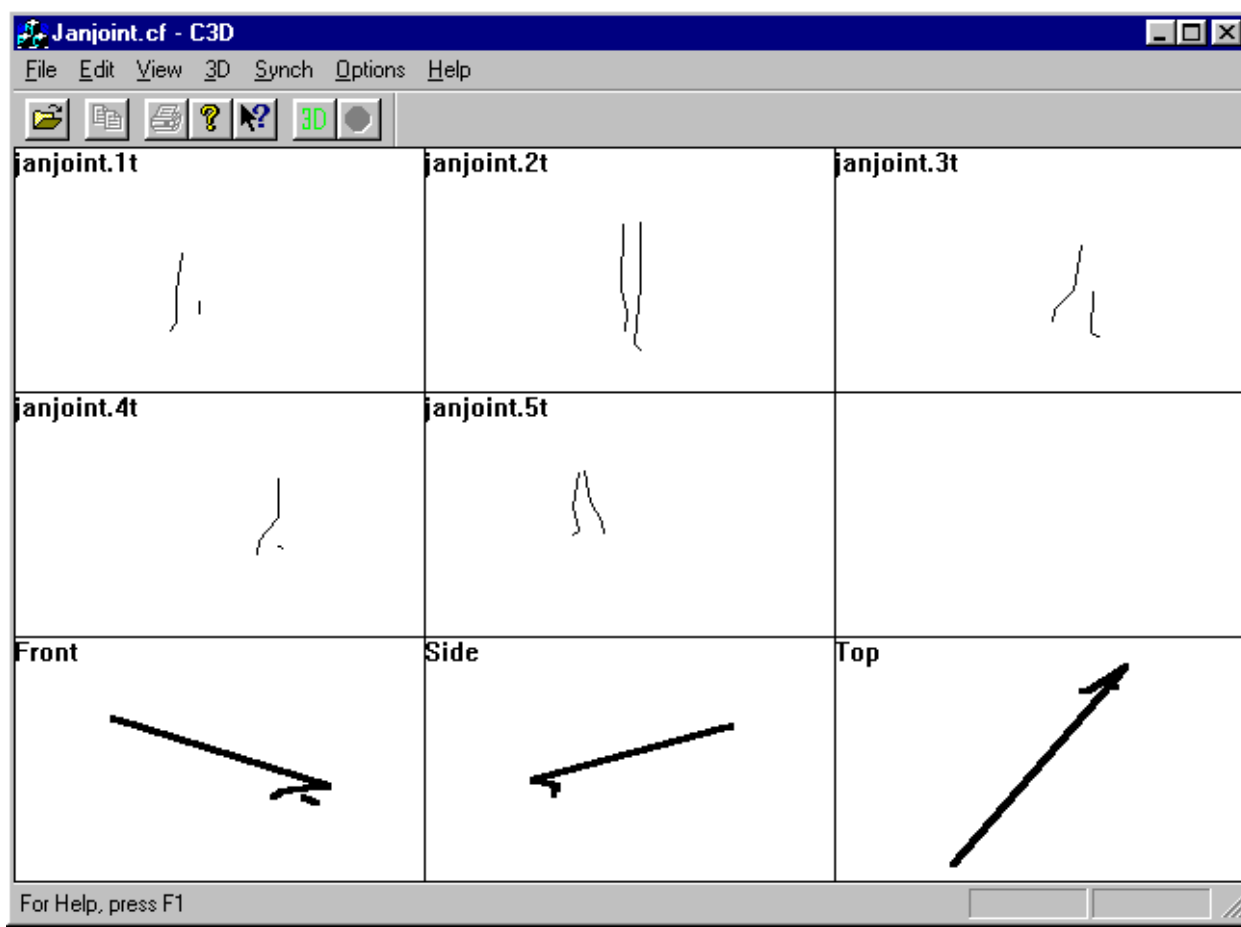
File View Help



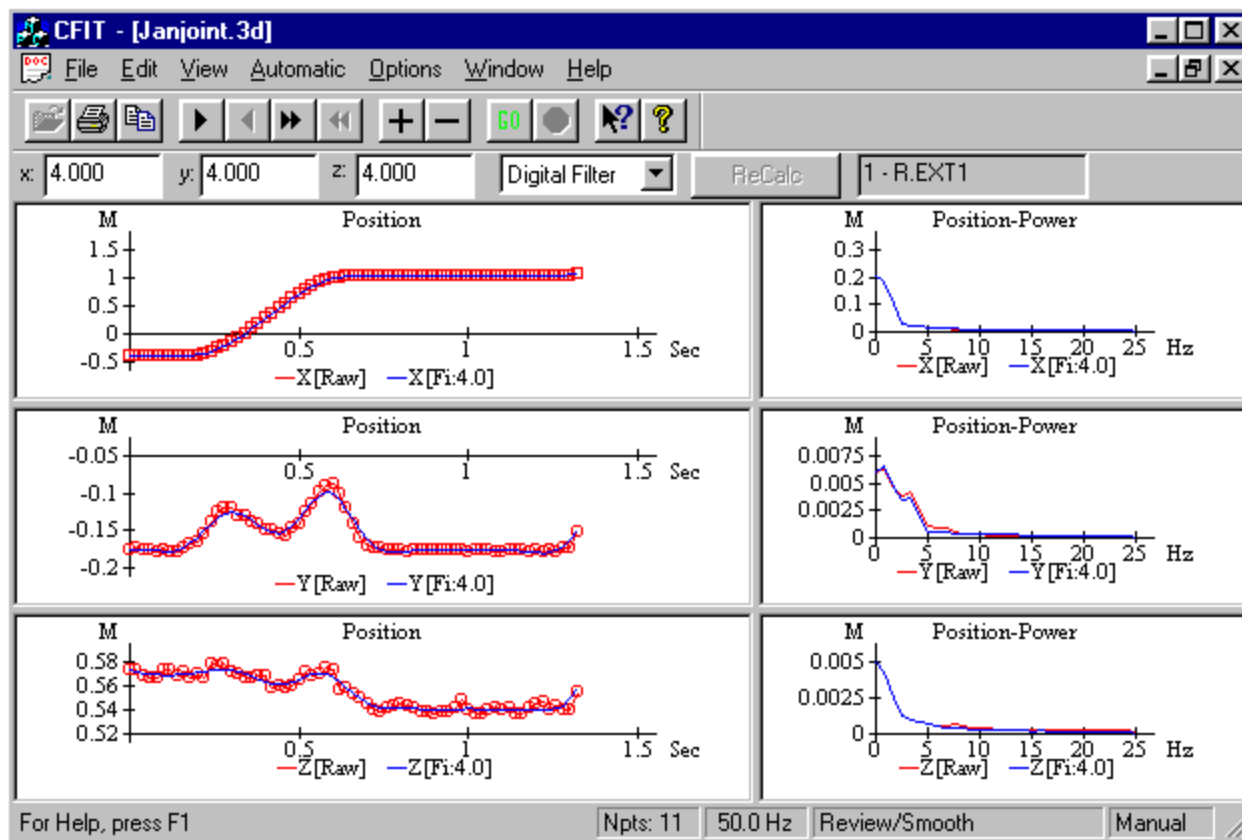
For Help, press F1

Data Pts Locked AutoD: Off 0/0

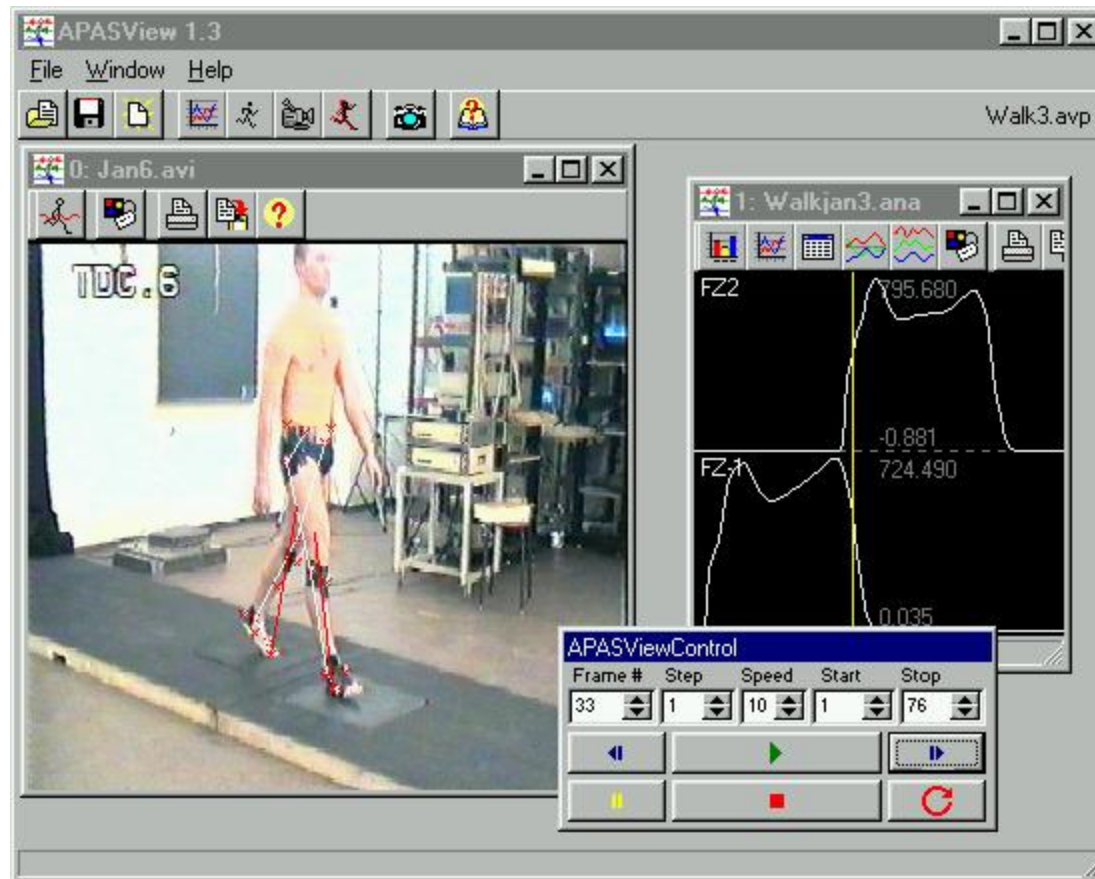
# Transformation



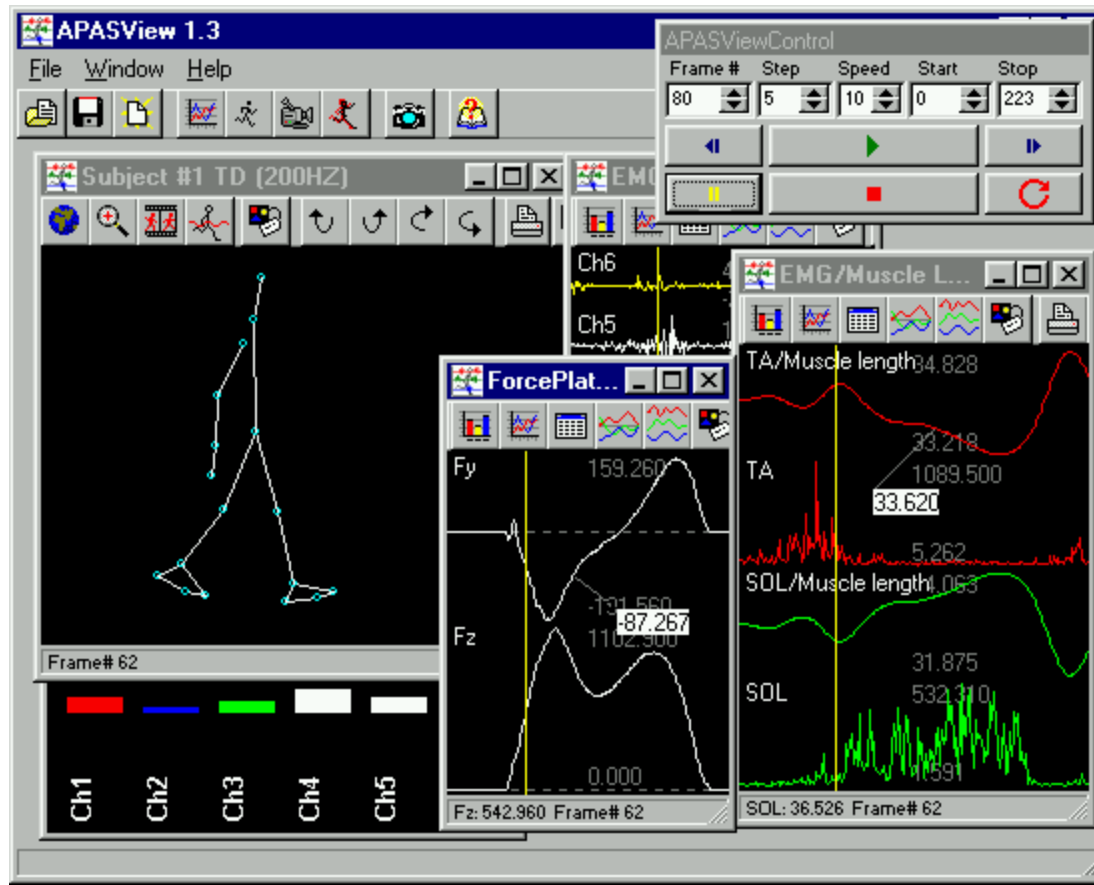
# Filtering/Smoothing



# Display and Analysis



# Display and Analysis







APASViewControl

Frame #	Step	Speed	Start	Stop
0	1	10	0	0

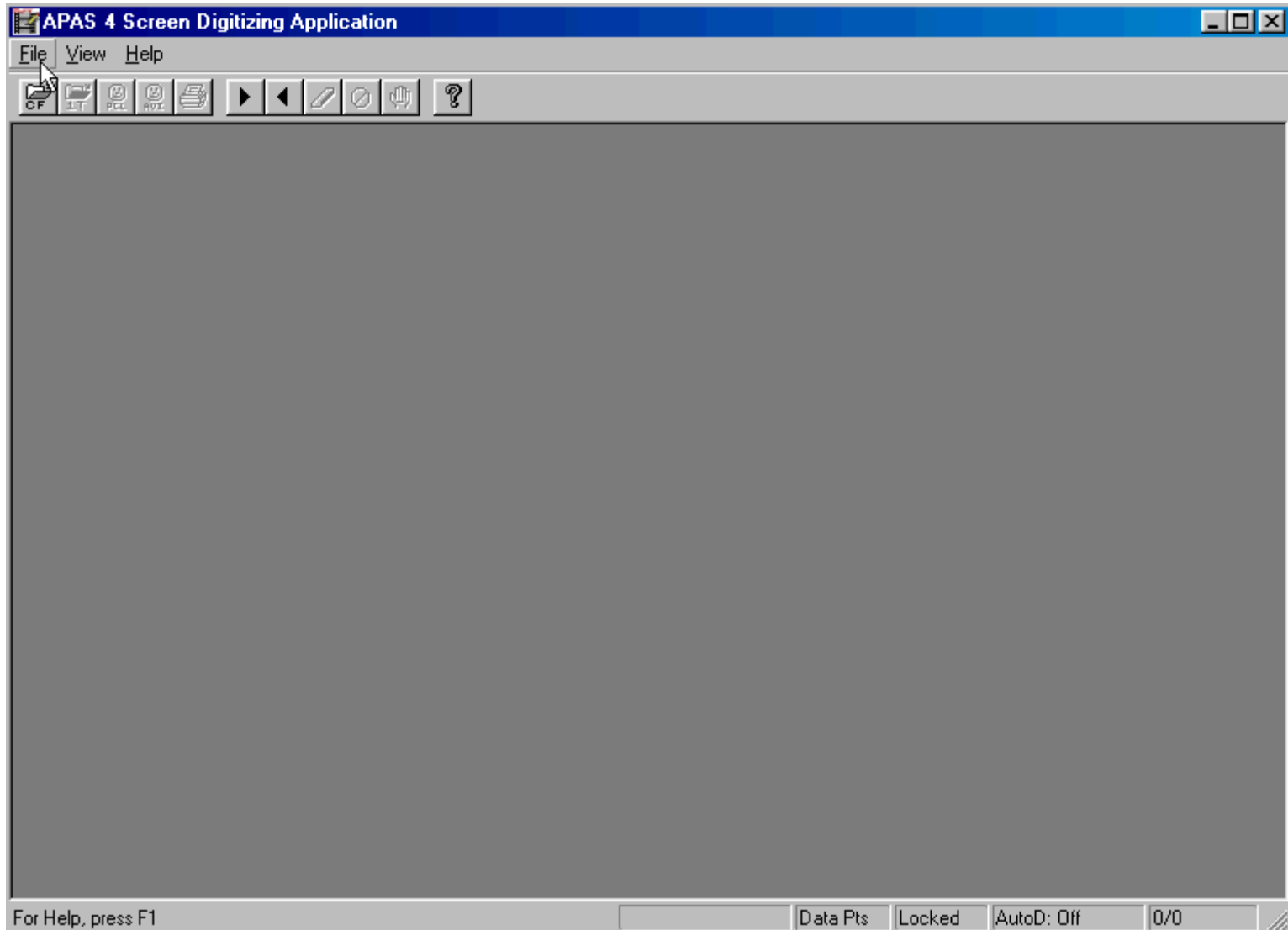
The screenshot displays the APASView 1.3 software interface, which is used for motion analysis. The interface is divided into several panels:

- Top Left Panel:** Contains the menu bar (File, Window, Help) and a toolbar with icons for file operations, playback, and analysis.
- Top Center Panel (APASViewControl):** Features controls for Frame # (18), Step (1), Speed (10), Start (0), and Stop (45). It includes buttons for previous frame, play, next frame, and a red stop button.
- Top Right Panel:** Shows the file name "HJump.avp" and window management icons.
- Center Panel:** Displays two side-by-side video frames of a person performing a high jump over a bar in an indoor facility.
- Bottom Left Panel (2: Hjump3d.3d):** Shows a 3D stick figure model of the jumper in a jumping pose. It includes a toolbar with navigation and analysis tools.
- Bottom Center Panel (4: Hjump3d.3d):** A data table showing vertical displacement (VY CG) over time. The current row is highlighted in purple.
- Bottom Right Panel (StickWindow):** A graph showing the vertical displacement (VY CG) over time. The peak is labeled with the value 403.840. The current time is 0.60 seconds.

The data table in the bottom center panel is as follows:

	VY CG
7	-18.363
0	99.665
3	213.600
7	302.660
0	397.900
3	403.840
7	358.250
0	376.690
3	358.660
7	279.020

# Summery



# Thank you

