



# Visual3D

## Real-Time Streaming



## Real-Time Streaming

If a motion capture system supports the streaming of real-time data, then you can stream that data directly into Visual3D. One benefit is that you can create a model, and see the data applied to a model in real-time and thus verify a meaningful data capture on the spot.



## Real-Time - Example (using c3d to emulate the real-time stream)

Static File: [mb.c3d](#)

Motion File: [mb004.c3d](#)

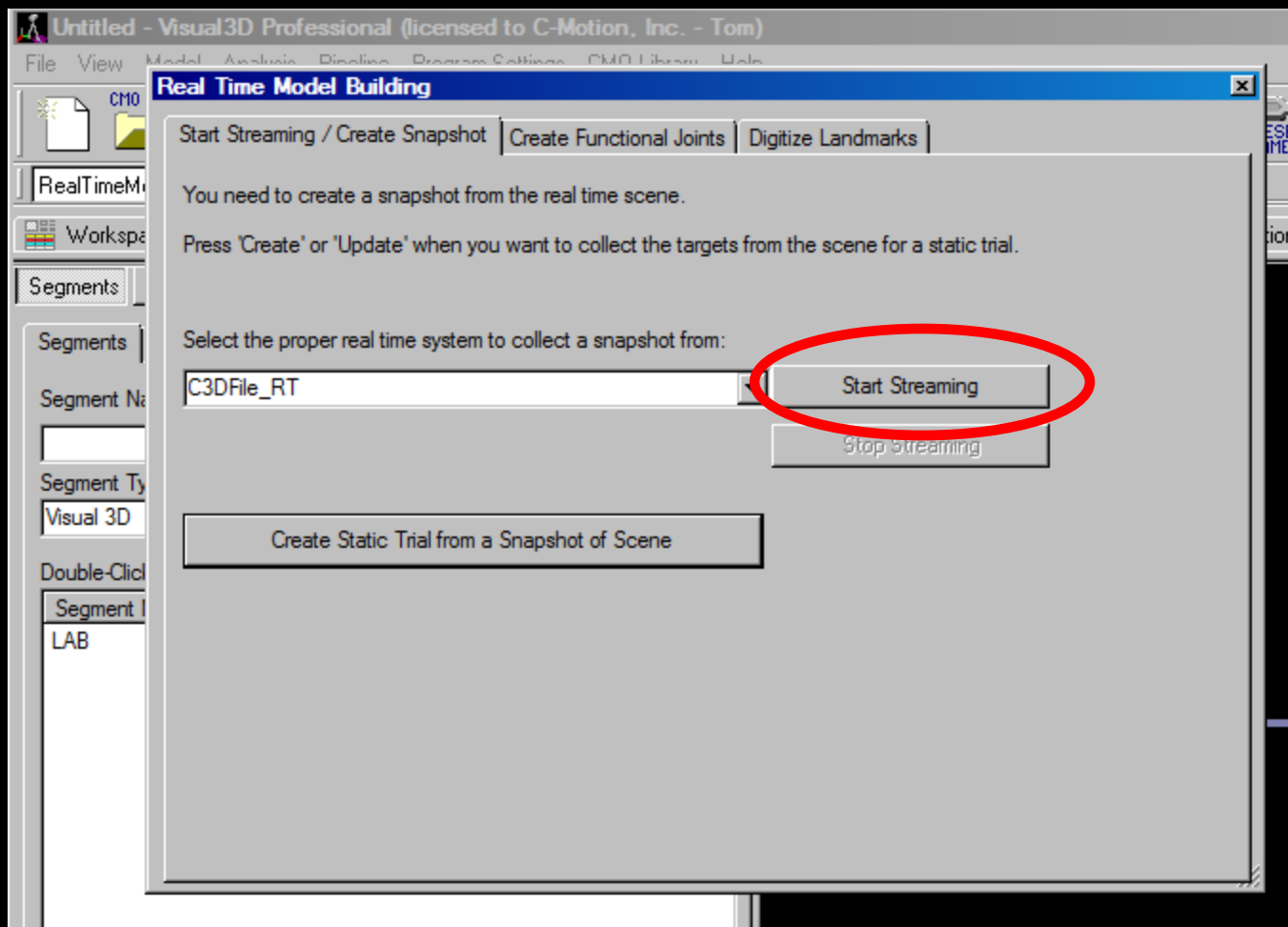
Model File: [mb.mdh](#)

The screenshot displays the C-Motion software interface. The 'File' menu is open, showing options like 'Create (Add Static Calibration File)', 'Compute Model Based Data', and 'Assign Model to Motion Files'. The 'Create (Add Static Calibration File)' option is selected, and its submenu is visible, highlighting 'Hybrid Model from Real Time Streaming'. The background shows a workspace with a 'GLOBAL' file and a 'Report Pages' section.

## The screenshot shows the main window of Visual3D Professional. At the top is a menu bar with options: File, View, Model, Analysis, Pipeline, Program Settings, CMO Library, and Help. Below the menu bar is a toolbar containing icons for opening files, saving, printing, recalculating, and running the pipeline. The main workspace area has tabs for 'Workspace Status', 'Signal and Event Processing', 'Model Building' (which is active), 'Reporting', 'Real-Time Capture', and 'Simulation'. On the left side, there's a panel labeled 'Pipeline Processes / Wizard' which contains a large empty white box. Overlaid on top of the main workspace is a modal dialog box titled 'Enter a name for the new model:'. Inside this dialog, it says 'Enter a name for the new model:' followed by a text input field containing 'RealTimeModel'. A 'Continue &gt;&gt;' button is located at the bottom right of the dialog. At the very bottom of the application window is a table-like structure with three columns: 'CMD Workspace', 'Models/Calibration Files', and 'Motion Files'. The first row under these columns shows 'Untitled' in the first column, an empty space in the second, and 'GLOBAL' in the third. There are several empty rows below this one.

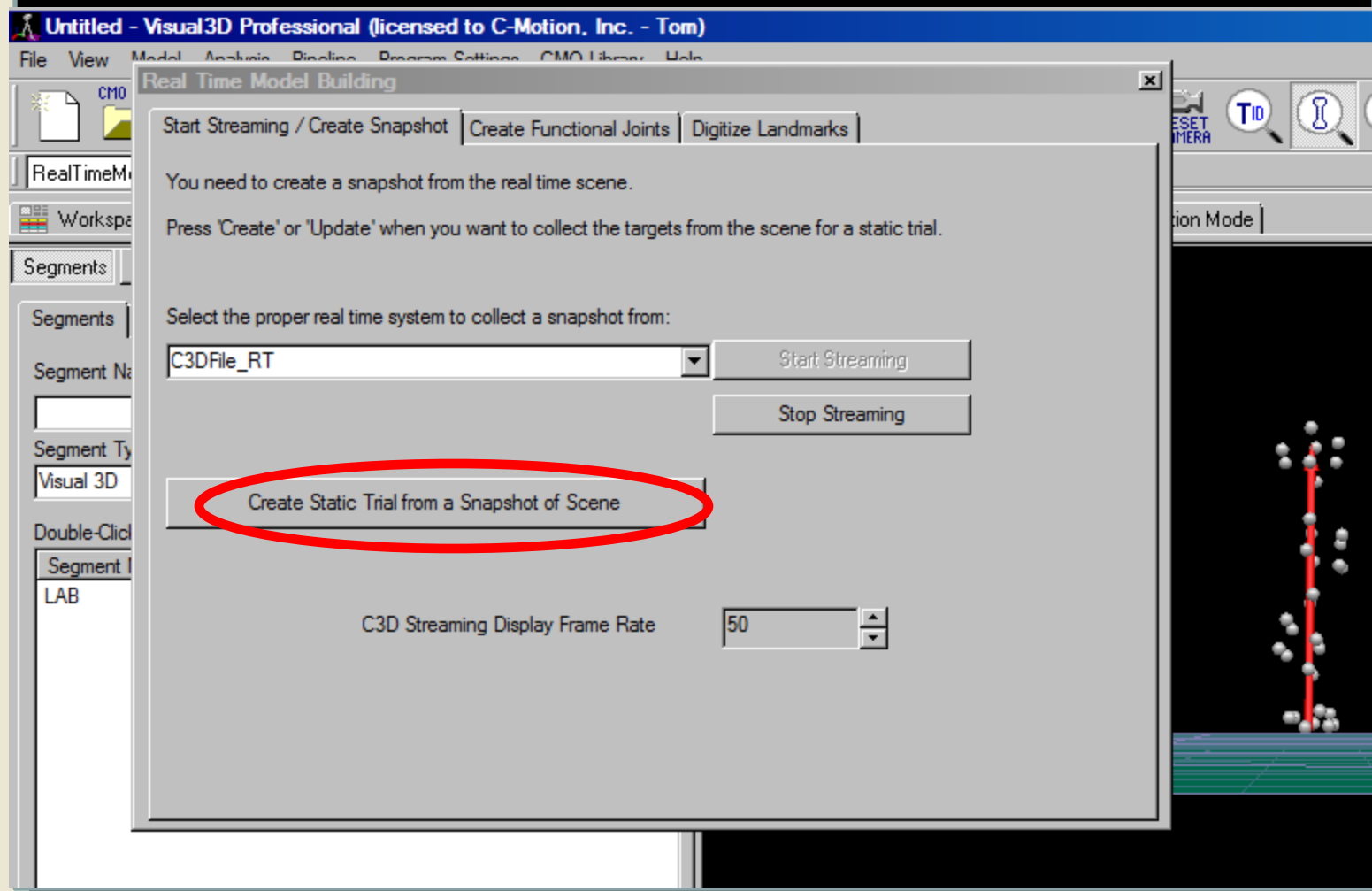


## Real-Time Example: Start the Stream



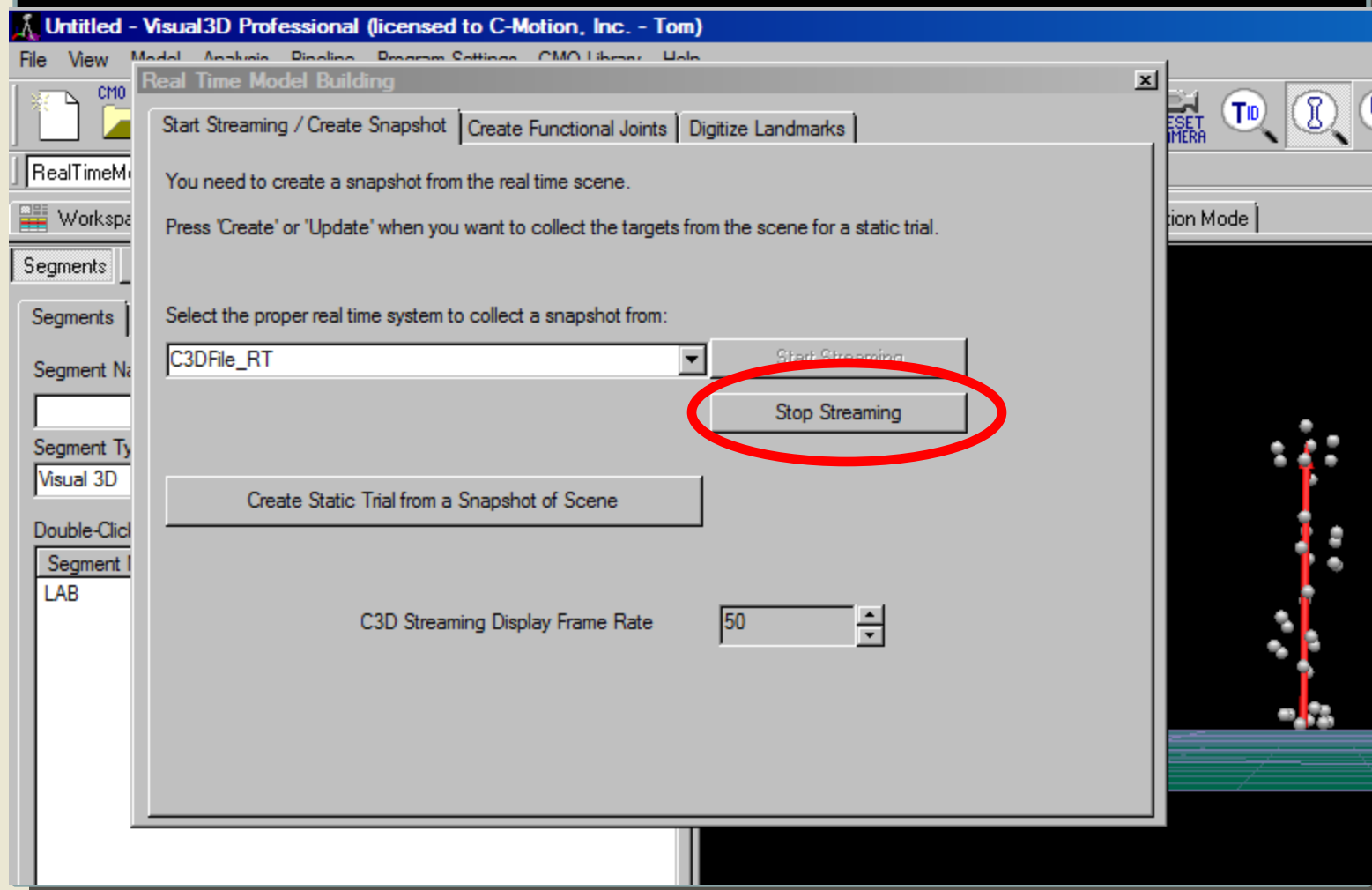


## Real-Time Example: Take a Snapshot





## Real-Time Example: Stop the Stream



## Real-Time Example: Load a Model (mdh) File

Untitled - Visual3D Professional (licensed to C-Motion, Inc. - Tom)

File View Model Analysis Pipeline Program Settings CMO Library Help

CMO C3D CMO RECALC PIPELINE Create a New Model MODEL BUILDER REALTIME MODEL BUILDER POST PROCESSOR FRONTAL SAGITTAL LATERAL ANIMATION RESET CAMERA T10 T20 T30 MDH MDH MDH

RealTimeModel

Workspace Status Signal and Event Processing Model Building Reporting Real-Time Capture Simulation Mode

Segments Landmarks Muscles Subject Data / Metrics

Segments Segment Properties IK Constraints

Segment Name

Segment Type

Visual 3D

Create

Double-Click Segment to View/Edit

| Segment Name | Segment Type | Calibrated |
|--------------|--------------|------------|
| LAB          | Visual 3D    | N/A        |

Modify Selected Segment Choose Algorithm for Computing Pose

Delete Selected Segment Visual3D 6 DOF

Build Model

Pipeline Processing (F11)

No Target selected

# Real-Time Example: Got to Real-Time Mode

Untitled - Visual3D Professional (licensed to C-Motion, Inc. - Tom)

File View Model Analysis Pipeline Program Settings CMO Library Help

CMO C3D CMO RECALC PIPELINE Create a New Model MODEL BUILDER REALTIME MODEL BUILDER POST PROCESS FRONTAL SAGITTAL PERSPECTIVE ANIMATION RESET CAMERA TID

RealTimeModel

Workspace Status Signal and Event Processing Model Building Reporting **Real-Time Capture** Simulation Mode

Segments Landmarks Muscles Subject Data / Metrics

Segments Segment Properties IK Constraints

Segment Name

Segment Type

Visual 3D

Create

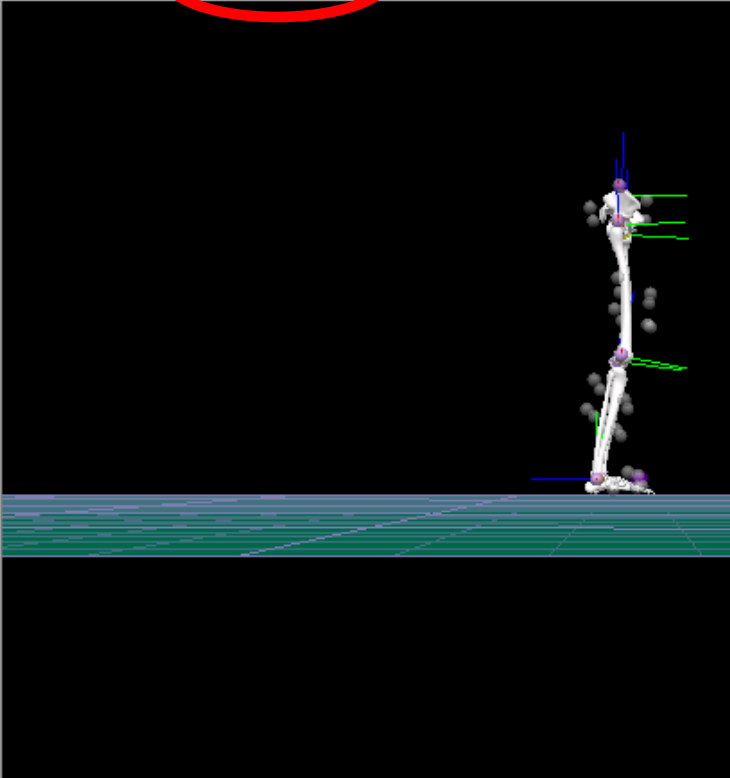
Double-Click Segment to View/Edit

| Segment Name | Segment Type | Calibrated |
|--------------|--------------|------------|
| LAB          | Visual 3D    | N/A        |
| Right Foot   | Visual 3D    | YES        |
| Right Shank  | Visual 3D    | YES        |
| Right Thigh  | Visual 3D    | YES        |
| Left Foot    | Visual 3D    | YES        |
| Left Shank   | Visual 3D    | YES        |
| Left Thigh   | Visual 3D    | YES        |
| Pelvis       | Visual 3D    | YES        |

Modify Selected Segment Choose Algorithm for Computing Pose

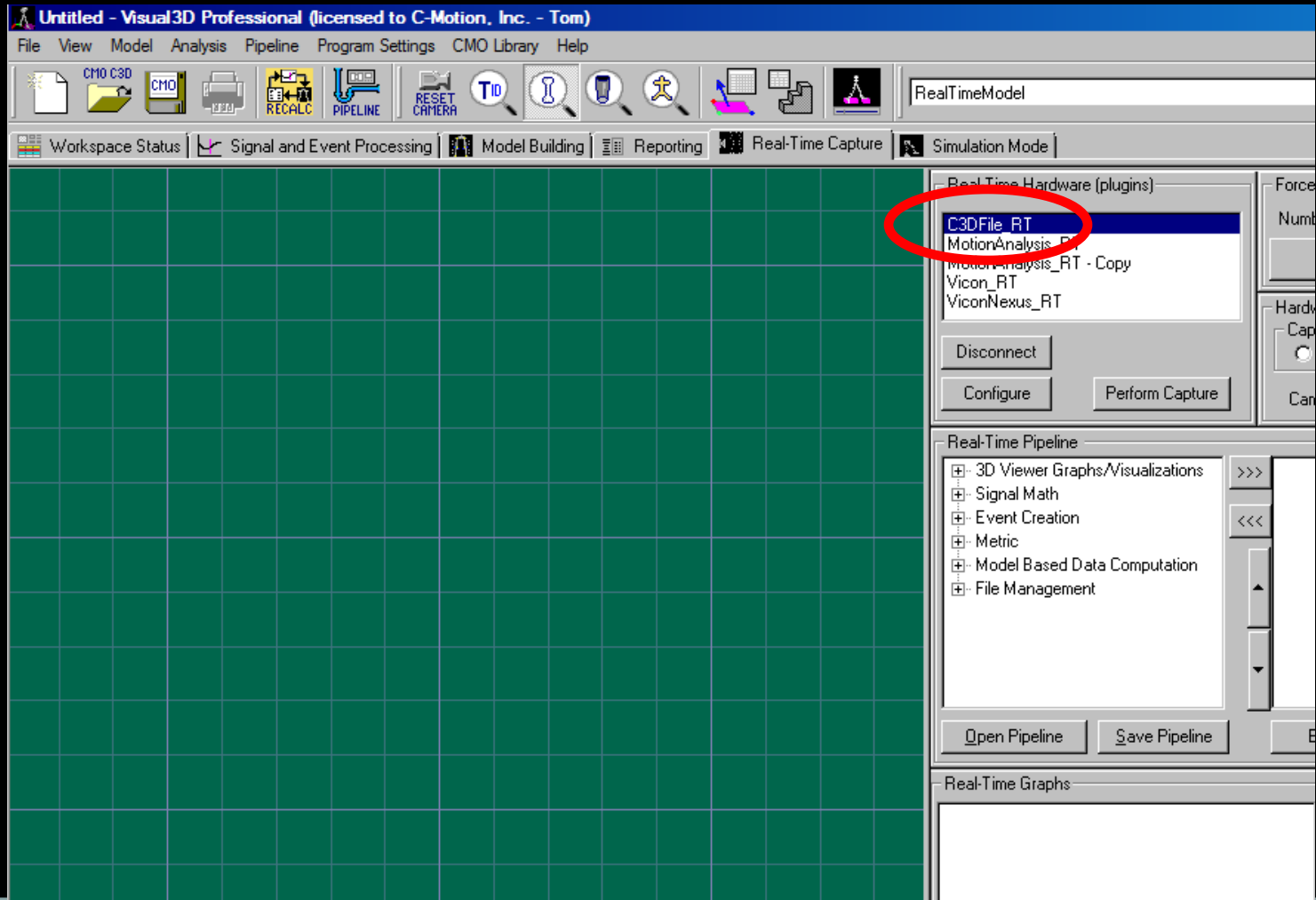
Delete Selected Segment Visual3D 6 DOF

Build Model





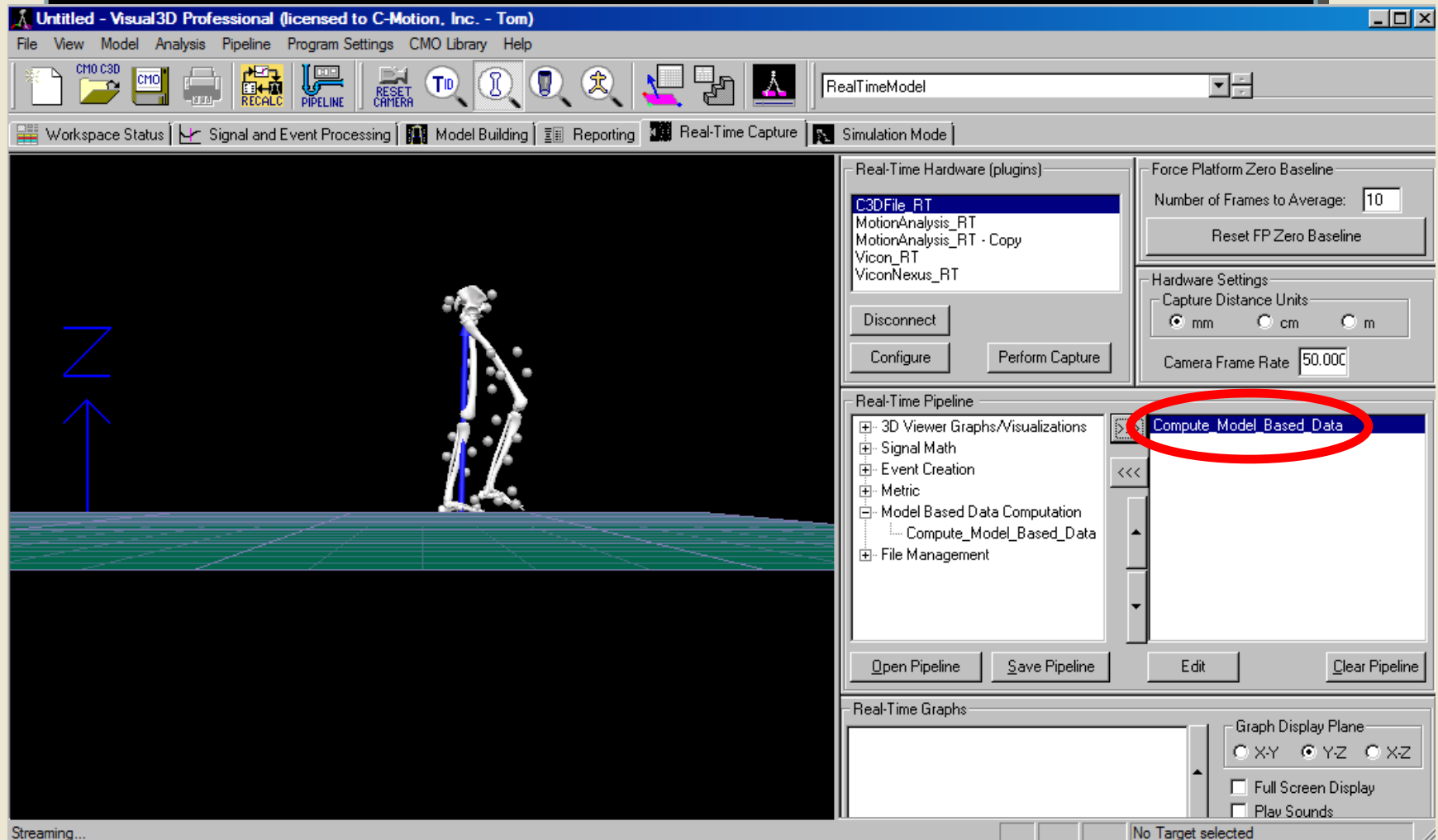
## Real-Time Example: Select the MoCap Plug-in





## Real-Time – Adding a Graph

### Step 1) Add a `Computed_Model_Based_Data` to the Pipeline



The screenshot displays the Visual3D Professional software interface, licensed to C-Motion, Inc. - Tom. The main window shows a 3D model of a human figure in a running pose, overlaid on a grid. A blue arrow points upwards, indicating the Z-axis.

The interface includes a menu bar (File, View, Model, Analysis, Pipeline, Program Settings, CMO Library, Help) and a toolbar with icons for CMO C3D, CMO, RECALC, PIPELINE, RESET CAMERA, TID, and other functions. The RealTimeModel dropdown is set to RealTimeModel.

The Workspace Status bar shows the current mode: Signal and Event Processing, Model Building, Reporting, Real-Time Capture, and Simulation Mode.

The Real-Time Hardware (plugins) section lists the following plugins:

- C3DFile\_RT
- MotionAnalysis\_RT
- MotionAnalysis\_RT - Copy
- Vicon\_RT
- ViconNexus\_RT

Buttons for Disconnect, Configure, and Perform Capture are available.

The Force Platform Zero Baseline section shows the Number of Frames to Average: 10, with a Reset FP Zero Baseline button.

The Hardware Settings section shows the Capture Distance Units (mm, cm, m) and the Camera Frame Rate (50.00C).

The Real-Time Pipeline section lists the following components:

- 3D Viewer Graphs/Visualizations
- Signal Math
- Event Creation
- Metric
- Model Based Data Computation
  - Compute\_Model\_Based\_Data
- File Management

The Compute\_Model\_Based\_Data component is highlighted with a red circle.

Buttons for Open Pipeline, Save Pipeline, Edit, and Clear Pipeline are available.

The Real-Time Graphs section shows the Graph Display Plane (X-Y, Y-Z, X-Z) and options for Full Screen Display and Play Sounds.

The status bar at the bottom indicates "Streaming..." and "No Target selected".



## Real-Time – Adding a Graph

### Step 2) Double Click **Compute\_Model\_Based\_Data** in the Pipeline and then complete the dialog for a right ankle angle

Untitled - Visual3D Professional (licensed to C-Motion, Inc. - Tom)

File View Model Analysis Pipeline Program Settings CMO Library Help

CMO C3D CMO RECALC PIPELINE RESET CAMERA TID

RealTimeModel

Workspace Status Signal and Event Processing Model Building Reporting Real-Time Capture Simulation Mode

**Compute Model Based Data**

Data Name: RKneeAngle

Folder: ORIGINAL

Result Folder will always be Original

Joint Angle (degrees):

Segment and Reference Segment define the angle desired. Normalization is relative to standing posture. The Cardan Sequence defines the order of rotations. Warning!!! If you are using the anatomical axes (ML, AP, or AXIAL) the sign of the angle follows the Right Hand Rule about the actual corresponding segment coordinate system axes.

Model Based Item Properties:

JOINT\_ANGLE

Normalization: Normalization Off

Segment: Right Shank

Reference Segment: Right Thigh

Cardan Sequence: X-Y-Z

Done Cancel

Real-Time Hardware (plugins):

C3DFile\_RT

RT - Copy

Perform Capture

Force Platform Zero Baseline

Number of Frames to Average: 10

Reset FP Zero Baseline

Hardware Settings

Capture Distance Units: mm cm m

Camera Frame Rate: 50.00C

Real-Time Graphs

Graphs/Visualizations

Compute\_Model\_Based\_Data

Open Pipeline Save Pipeline Edit Clear Pipeline

Graph Display Plane: X-Y Y-Z X-Z

Full Screen Display

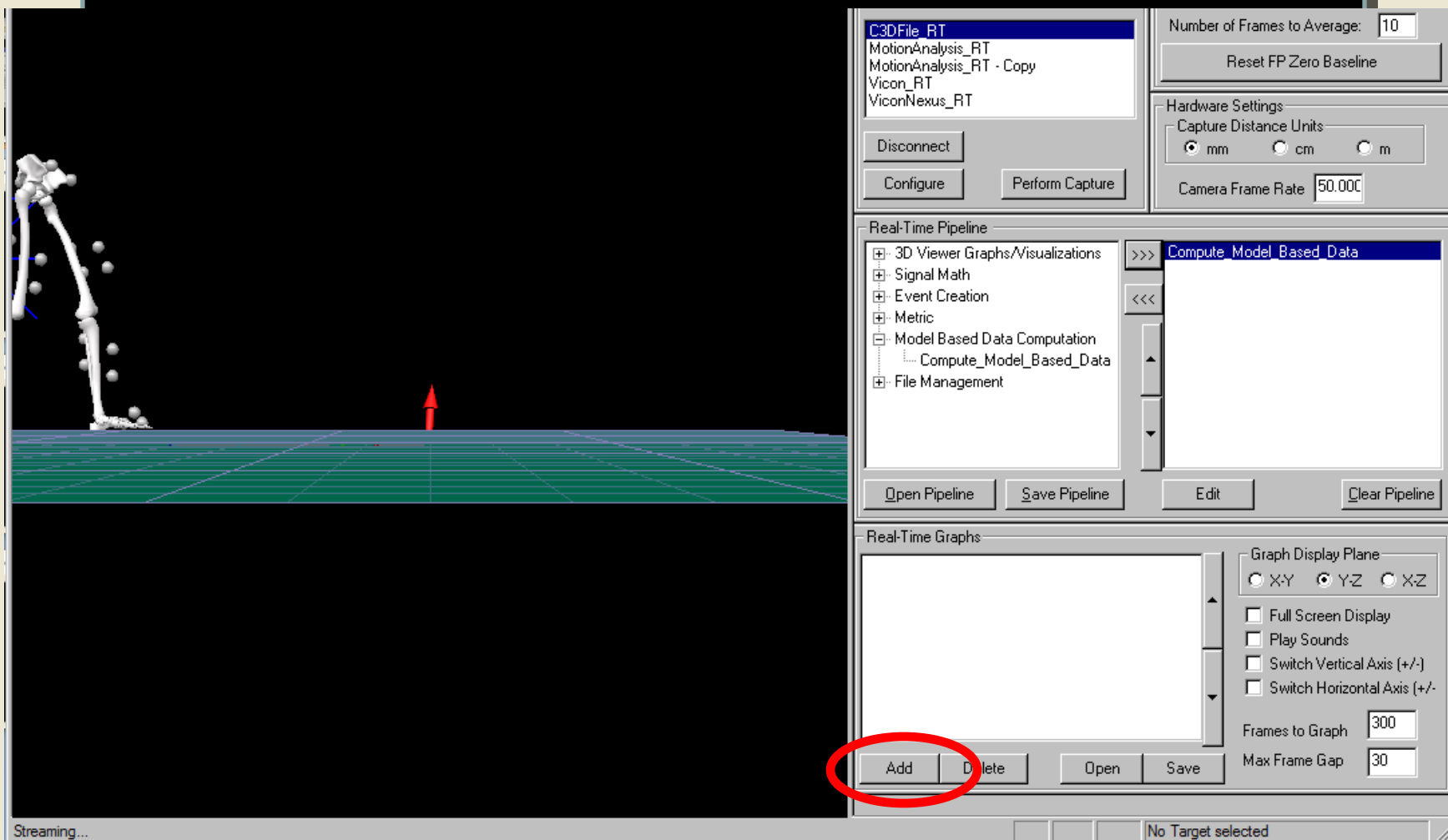
Play Sounds

No Target selected



## Real-Time – Adding a Graph

Step 3) Click **Add** to add a Real-time graph



The screenshot displays the C-Motion software interface. On the left is a 3D viewer showing a skeletal model of a leg in a dynamic pose. The main panel on the right contains the 'Real-Time Pipeline' and 'Real-Time Graphs' sections.

**Real-Time Pipeline:**

- Buttons: Disconnect, Configure, Perform Capture
- Hardware Settings: Number of Frames to Average: 10, Reset FP Zero Baseline
- Capture Distance Units: ☒ mm, ☐ cm, ☐ m
- Camera Frame Rate: 50.000
- Real-Time Pipeline list: 3D Viewer Graphs/Visualizations, Signal Math, Event Creation, Metric, Model Based Data Computation (expanded), Compute\_Model\_Based\_Data, File Management
- Buttons: Open Pipeline, Save Pipeline, Edit, Clear Pipeline

**Real-Time Graphs:**

- Graph Display Plane: ☐ X-Y, ☒ Y-Z, ☐ X-Z
- Full Screen Display: ☐
- Play Sounds: ☐
- Switch Vertical Axis (+/-): ☐
- Switch Horizontal Axis (+/-): ☐
- Frames to Graph: 300
- Max Frame Gap: 30
- Buttons: Add, Delete, Open, Save

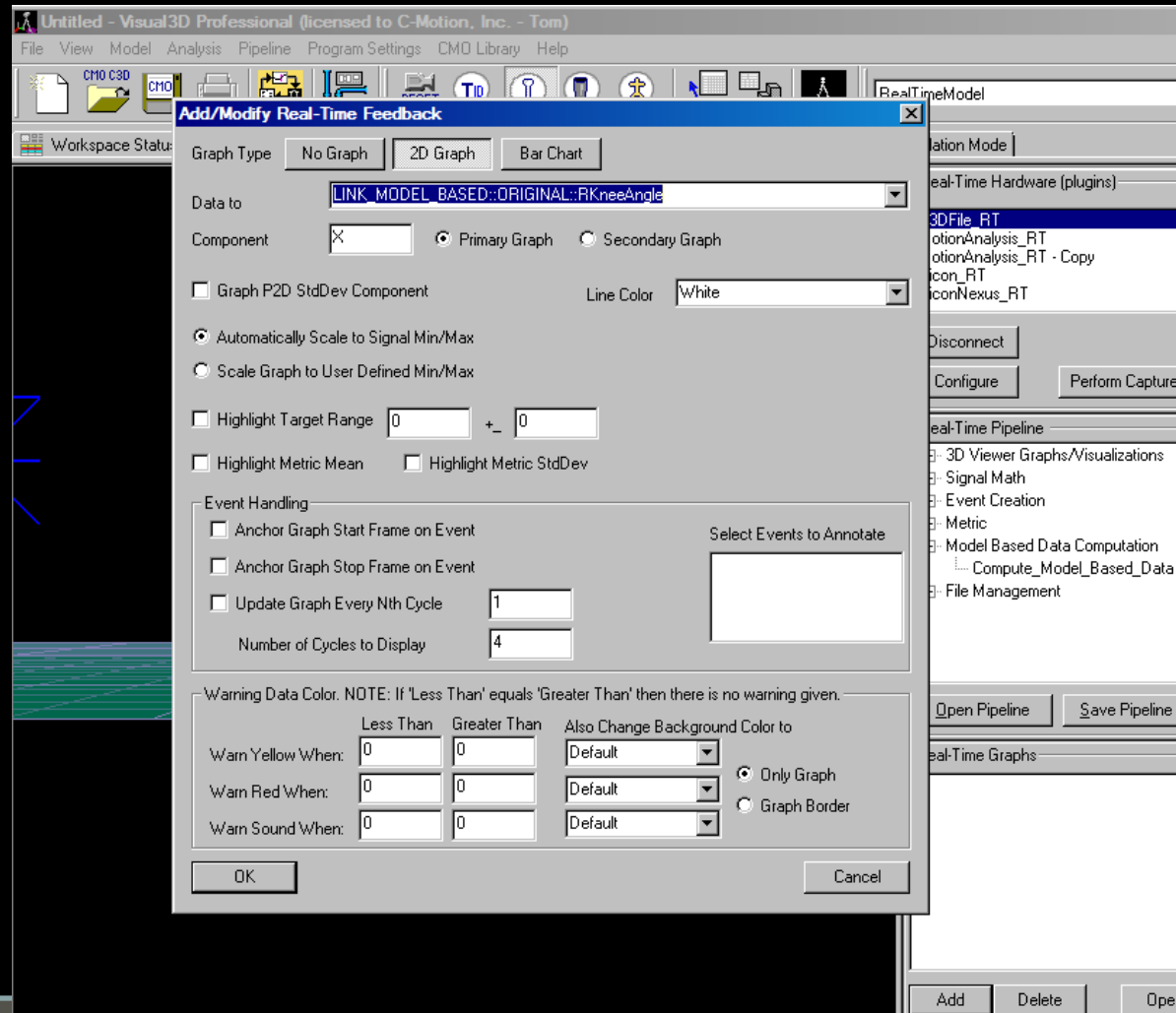
The 'Add' button in the Real-Time Graphs section is circled in red, indicating the next step in the process.

Streaming...

No Target selected

## Real-Time – Adding a Graph

### Step 4) Pick the Ankle Angle from Data To





# Real-Time Example: Result

