



Autodesk University Round Table Summary

SESSION TITLE	Autodesk® Robot™ Structural Analysis API Roundtable: Customize Your Design
SESSION ID	SE1990-R
SPEAKER	Rafal Gaweda
COMPANY	Autodesk, Inc.

MAIN DISCUSSION POINTS

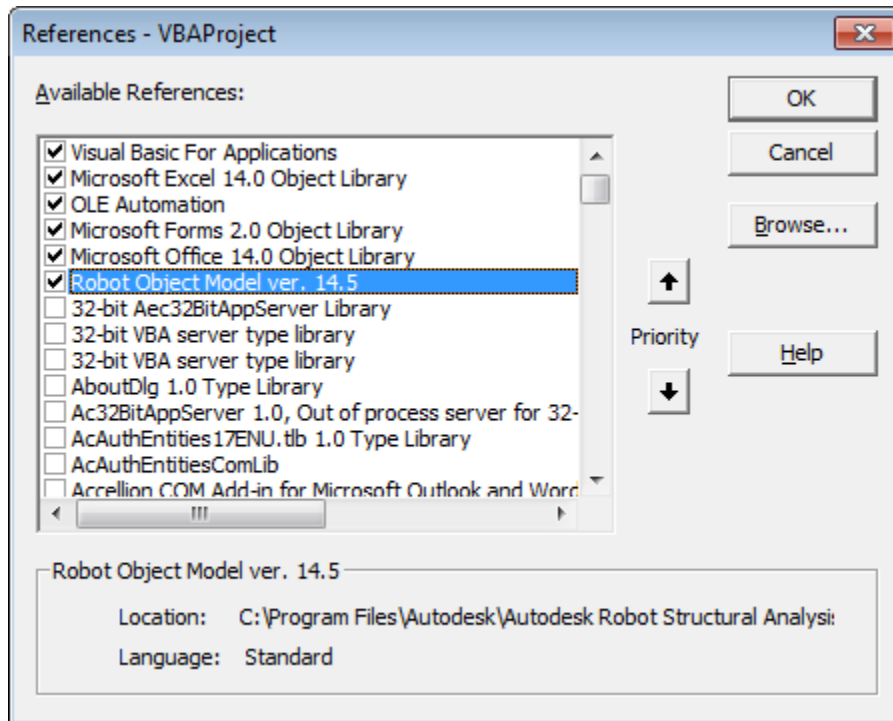
- What is API
- How to start programming
- What kind of data , results can be accessed by Robot API
- For what purposes Robot API can be used – clients examples

KEY TAKE-AWAYS

- SDK installation : DVD\X86\Tools\RSASDK
- SDK and Examples on computer after installation :
C:\Program Files\Autodesk\Autodesk Robot Structural Analysis Professional 2014\SDK\ROBOTSDK.html
- API Examples on Forum
<http://forums.autodesk.com/t5/Robot-Structural-Analysis/useful-addins-for-Robot-API/td-p/3899448>
- Robot Forum – the place where many hints and information about API can be found
<http://forums.autodesk.com/t5/Autodesk-Robot-Structural/bd-p/351>
- To start programming it is required to set reference to Robot Object Modeler v.14.5 (for Robot 2014)



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SUGGESTED FOLLOW-UP

- Example VBA code for creating bar with user section

```
Public RobApp As RobotApplication
```

```
Public Sub CommandButton1_Click()
```

```
Set RobApp = New RobotApplication
```

```
'starting new project; structure type 3D frame
```

```
RobApp.Project.New I_PT_FRAME_3D
```

```
RobApp.Visible = True
```

```
RobApp.Interactive = True
```



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'servers set to access data faster, no need to do it for relatively small models, in case of having hundreds \ thousands

' nodes, bars use servers or even better cache

```
Dim NServer As RobotNodeServer
Dim BServer As RobotBarServer
Set NServer = RobApp.Project.Structure.Nodes
Set BServer = RobApp.Project.Structure.Bars
```

'creating nodes

```
NServer.Create 1, 0, 0, 0
```

```
NServer.Create 2, 2, 0, 0
```

' if you want numbering made by robot please use NServer.FreeNumber to "generate" nodenumber

' example:

' startnode = NServer.FreeNumber

' NServer.Create startnode, 0, 0, 0

'creating bar

```
BarNumber = 1
```

'BarNumber = BServer.FreeNumber

```
BServer.Create BarNumber, 1, 2
```

'creating section

```
Dim SecLabel As RobotLabel
```

```
Dim BridgeSectionData As RobotBarSectionData
```

```
Dim Secname As String
```

```
Secname = "Sec1"
```

```
If Not RobApp.Project.Structure.Labels.Exist(I_LT_BAR_SECTION, Secname) Then
```

```
Set SecLabel = RobApp.Project.Structure.Labels.Create(I_LT_BAR_SECTION, Secname)
```

```
Set BridgeSectionData = SecLabel.Data
```

```
BridgeSectionData.ShapeType = I_BSST_UNKNOWN
```

```
BridgeSectionData.SetValue I_BSDV_AX, 100000000
```

```
BridgeSectionData.SetValue I_BSDV_IX, 200000000
```

```
BridgeSectionData.SetValue I_BSDV_IY, 300000000
```

```
BridgeSectionData.SetValue I_BSDV_IZ, 400000000
```

```
RobApp.Project.Structure.Labels.Store SecLabel
```

```
End If
```



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```
'applying section to bar
Dim Bar As RobotBar
Set Bar = BServer.Get(BarNumber)

Bar.SetLabel I_LT_BAR_SECTION, SecLabel.Name 'or Secname

'loading material if exists in job preferences

Dim MatLab As RobotLabel
Set MatLab = RobApp.Project.Structure.Labels.Get(I_LT_MATERIAL, "C30/37")

' defining user material - in this example steel, if concrete ....I_MT_CONCRETE
' Dim MatLab As RobotLabel
' Dim MatData As RobotMaterialData

' Set MatLab = RobApp.Project.Structure.Labels.Create(I_LT_MATERIAL, "MySteel")

' Set MatData = MatLab.Data
' MatData.Type = I_MT_STEEL
' MatData.E = 210000

' MatData.NU = 0.3
' MatData.RO = 77
' MatData.Kirchoff = MatData.E / (2 * (1 + MatData.NU))
' MatData.SaveToDBase

' RobApp.Project.Structure.Labels.Store MatLab

'applying material to bar
Bar.SetLabel I_LT_MATERIAL, MatLab.Name
End Sub
```

- Other examples:

<http://forums.autodesk.com/t5/Robot-Structural-Analysis/useful-addins-for-Robot-API/td-p/3899448>