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# Installation

VisionLab comes with an installation program. Just start the installation by doubleclicking on the Setup.exe file and follow the installation instructions.

## Where is VisionLab

After the installation VisionLab is located under a single root directory. The default location is C:\Program Files\LabPacks . During the installation the user has the option to select alternative directory.

Here is how the directory structure should look like after the installation:



Under the VisionLabDemos directory are located the demo files. The help files and the documentation are located under the Help directory. The DLL directory contains the redistributable DLL files. The header files needed for your projects are located under the Include directory. The Release and Debug version of the library is located under the Lib directory.

It is a great idea to start by opening and compiling the demo files. The demo projects ware designed with Visual C++ 6.0. They can be opened and compiled under Visual C++.NET as well, in this case the IDE will create the necessary solution files.

## Creating a new VisionLab project in Visual C++

All of the examples in this manual start with creating a MFC Dialog based project. This is not a VisionLab requirement, but using the resource editor to design the application makes writing the examples much easier.

The following chapters will assume that you have created the project and will teach you how to add specific VisionLab functionality.

Visual C++ 6.0:

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Start by creating a new project.	
From the VC++ menu, select   File   New	
🥙 Microsoft Visual C++	
File Edit View Insert Project	
Open <u>W</u> orkspace	
Close Workspace	
Save Ctrl+5	
🗗 Save Ali	
Page Setup	
Recent Files	
Recent Workspaces	
Exit	
The project type dialog will appear. Select f	he MFC AppWizard:
The project type dialog will appear. Select t	
New	
Files Projects Workspaces Other Documents	
ATL COM AppWizard	Project name:
Cluster Resource Type Wizard	
Custom AppWizard	Location:
DevStudio Add-in Wizard	C:\MyTreasureLabProjects\
Sectored Stored Proc Wizard	
ISAPI Extension Wizard	
ufisi Makefile MEC ActiveX Control v (acred	<u>Cr</u> eate new workspace
MFC Actives Controlwizard	<u>A</u> dd to current workspace      Dependency of:
🚰 MFC AppWizard (exe)	
T Utility Project	
Win32 Console Application	
Win32 Dynamic-Link Library	Platforms:
🔊 Win32 Static Library	♥ winsz
	OK Cancel

Type a project name. For each example the	project name will be different:
New	? 🔀
Files Projects Workspaces Other Documents	
ATL COM Apply and	Project name:
Cluster Besource Tune Wizard	MyFirstProject
Database Project	Location:
DevStudio Add-in Wizard	C:\MyTreasureLabProjects\MyFi
🛋 Extended Stored Proc Wizard	
ISAPI Extension Wizard	
ur Makefile	Create new workspace
MFC ActiveX ControlWizard	C Add to current workspace
MFC AppWizard (dll)	Dependency of:
Pre HPC Appwizard (exe)	
Win32 Application	
Win32 Console Application	
Win32 Dynamic-Link Library	Platforms:
Win32 Static Library	In Win32
<u></u>	
	OK Cancel
Click UK.	
	1 1 1 1 1 1
Select a Dialog base project from Step 1 and	d click Next:
MFC AppWizard - Step 1	
Application What type of application we	puld you like to create?
OK C Single document	
Cancel C Multiple desuments	
(* <u>Dialog based</u>	
Document/View arch	itecture support?
	1
What janguage would you I	ike your resources in ?
English [United States] (	
< <u>B</u> ack <u>N</u> ext> <u>F</u> inish	Cancel

For simplicity disable the	ActiveX Controls on Step 2 and c	lick Next:
MFC AppWizard - Step 2 of 4	? 🛛	
	What features would you like to include?	
Application	E About box	
Cancel	Context-sensitive H <u>e</u> lp	
	✓ <u>3</u> D controls	
	What other support would you like to include?	
	Automation	
	ActiveX Controls	
	Would you like to include WOSA support?	
Editing Control: Record	□ Windows Sockets	
X Check Box (  Radio Button  Radio Button	_	
	Please enter a title for your dialog:	
	SimpleVideoPlayer	
< <u>B</u> ack	<u>N</u> ext > <u>F</u> inish Cancel	
Leave the default options	on Step 3 and click Next:	
MFC AppWizard - Step 3 of 4	? 🛛	
Microsoft Developer Studio	What style of project would you like ?	
File Edit Yiew Insert Build Help	MEC Standard	
Project     Project.cpp	C Windows Explorer	
	Would you like to generate source file comments?	
	Yes, please	
Ready	. 🔿 No, <u>t</u> hank you	
	How would you like to use the MFC library?	
	As a shared <u>D</u> LL	
	$\bigcirc$ As a statically linked library	
r		
< <u>B</u> ack	<u>N</u> ext > <u>Finish</u> Cancel	

At this point you should have a new From the menu select  Project Set	ew project created. tings :
oject - Microsoft Visual C++ - [MyFirstProje	ct.rc - ID
View Insert Project Build Layout Tools Window	
🕼 🐰 🔋 Set Active Project 🕨	VCL
tDlg	FirstProj
Dependencies	
Settings Alt+F7	<u>  </u>
Export Makerile	MyFi
Insert Project into Workspace	
In the Project Settings dialog sele	et the   Link   tab and in the ". Switch to the "Input"
cathegory. In the "Additional libr	ary path:" edit box add the path to the library files. If
you have followed the default ins	tallation it should be located at C:\Program
Files\LabPacks\Visual C++\Lib:	
Project Settings	
Settings For: Win32 Debug	General Debug C/C++ Link Resourc(
⊡-i≝al SimpleScope	Category: Input
🕀 🧰 Header Files	Object/library modules:
⊡ @ SimpleWaterfall	Ignore libraries: 🔲 Ignore <u>a</u> ll default libraries
⊡ 🔄 Source Files	
SimpleWaterfall.rc	Eorce symbol references:
<ul> <li></li></ul>	
Header Files	Additional library path:
Resource Files	C:\Program Files\LabPacks\MSVC\PlotLab Visual C++\Lit
	/nologo /subsystem:windows /incremental:yes
	/pdb:"Debug/SimpleScope.pdb" /debug
<u></u>	
	OK Cancel
Switch to the $ C/C++ $ tab.	
In the "Additional include director	pries:" edit box add the path to the header files. If you
have followed the default installa	tion they should be located at C:\Program

Files\LabPacks\Visual C++\Include:				
Project Settings	? 🔀			
Settings For: Win32 Debug	General       Debug       C/C++       Link       Resourc       Image: Comparison of the symbols         Category:       Preprocessor       Image: Comparison of the symbols       Image: Comparison of the symbols         Preprogessor definitions:       WIN32_DEBUG_WINDOWS_MBCS       Undefine all symbols         Undefined symbols:       Undefine all symbols         Additional include directories:       Image: Comparison of the symbols         Additional include directories:       Image: Comparison of the symbols         Ignore standard include paths       Project Options:         //nologo /MTid /W/3 /Gm /GX /ZI /Od /l       Image: Comparison of the symbols of the symbols         //nologo /MTid /W/3 /Gm /GX /ZI /Od /l       Image: Comparison of the symbols			
	OK Cancel			
Click OK.				
Now you have fully configured p	project, and you can start writing the actual code.			

Visual C++ 2003:

Start by creating a new project. From the VC++ menu_select   File   New_   Project						
🦇 N	licrosoft Development Envir	onme	nt [design] - Start Page	5 1		
Eile	<u>E</u> dit <u>V</u> iew <u>T</u> ools <u>W</u> indow	<u>H</u> elp				
	New •	Į٦	Project Ctrl+Shift+N			
	Open •	管	Eile Ctrl+N			
	Close	<b>ä</b>	Blank Solution			
	Add Project		Project <u>s</u> O <u>n</u> l			
7	Op <u>e</u> n Solution					
	Close Solution					
	Save Selected Items Ctrl+S		Get Started			
	Save Selected Items <u>A</u> s		What's New			
Ø	Save All Ctrl+Shift+S		Online Community Headlines			
	Sou <u>r</u> ce Control		Search Online			
	Page Setyp		Downloads			
5	Print Ctrl+P		XML Web Services			
	Recent Eiles		Web Hosting			
	Recent Projects					
	Exit					
_						

New Project         Project Types:         Implates:         Implateston	The project type	dialog will ap	pear. Select	the MFC A	Application:	
Project Types:       Implates:         Implates:       Implatestroped:         Imp	New Project					
Wisual C# Projects       Image: MFC Active X       Image: MFC DLL         Image:	Project Types:		Templates:			
An application that uses the Microsoft Foundation Class Library.  yame: <enter name=""> yocation: C:\MyTreasureLabProjects</enter>	Visual C# Project	ects oyment Projects	MFC ActiveX Control	MFC Application		
yame: Criter name> yocation: C:(MyTreasureLabProjects   ■ Browse Project will be created at C:(MyTreasureLabProjects) <enter name="">. Type a project name. For each example the project name will be different: New Project Project Types: Implates: Project Types: Implates: Wisual C+P Projects Wisual C+P Projects Wisual C+P Projects Wisual C+P Projects Wisual C+P Projects Wisual C+P Projects Wisual C+P Projects WFC ActiveX MFC Control Ant Selenaral Selena</enter>	An application that uses	; the Microsoft Foundatio	on Class Library.			
Location: C:(MyTreasureLabProjects   Project will be created at C:(MyTreasureLabProjects) < Enter name>.   Image: Comparison of the compar	Name:	<enter name=""></enter>				
Project will be created at C:\MyTreasureLabProjects\ <enter name="">.           Image: CK Cancel Help         OK Cancel Help         Cype a project name. For each example the project name will be different:         New Project         Image: Project Types:         Image: Visual C# Projects         Visual C# Projects         Image: Visual C# Pro</enter>	Location:	C:\MyTreasureLabProje	cts	•	Browse	
YMorg       OK       Cancel       Help         Cype a project name. For each example the project name will be different:         New Project       Image: C# Projects         Project Types:       Image: C# Projects         Wisual C# Projects       Image: Charles         Visual C++ Projects       Image: Charles         WFC ActiveX       MFC         WFC ActiveX       MFC         WFC Control       Application         WFS2       Image: MFC ISAPI         Extension Dil       Image: Mrc ISAPI         An application that uses the Microsoft Foundation Class Library.       Image: Mrc ISAPI         Name:       MrFirstProjects       Image: Mrc ISAPI         Location:       C:(MyTreasureLabProjects)       Image: Browse         Project will be created at C:(MyTreasureLabProjects)       Image: Browse	Project will be created at	: C:\MyTreasureLabProje	ects\ <enter name="">.</enter>			
Type a project name. For each example the project name will be different:         New Project         Image: Second	<b>▼</b> Mor <u>e</u>		ОК	Cancel	Help	
Visual C# Projects       Image: NET         NET       Image: NET         ATL       Image: NEC         MFC       ActiveX         MFC       Application         MFC       Image: NEC         Win32       Image: NEC         General       Image: NEC         Other Projects       Image: Nec         Mec       Image: Nec         Mec       Image: Nec         Mec       Image: Nec         Image: Nec	New Project		<u>T</u> emplates:	project in		
An application that uses the Microsoft Foundation Class Library.         Name:       MyFirstProject         Location:       C:\MyTreasureLabProjects         Project will be created at C:\MyTreasureLabProjects\MyFirstProject.         Image: OK Cancel Help	Visual C# Project Visual C++ Project NET ATL Win32 General Setup and Deplot Other Projects	cts ects pyment Projects	MFC ActiveX Control	FC MFC Application	MFC DLL	
Name:     MyFirstProject       Location:     C:\MyTreasureLabProjects       Project will be created at C:\MyTreasureLabProjects\MyFirstProject.       The project       The project       OK       Cancel       Help	An application that uses	; the Microsoft Foundatio	on Class Library.			
Location:       C:\MyTreasureLabProjects       Browse         Project will be created at C:\MyTreasureLabProjects\MyFirstProject.       Browse         The project will be created at C:\MyTreasureLabProjects\MyFirstProject.       Help	<u>N</u> ame:	MyFirstProject				
Project will be created at C:\MyTreasureLabProjects\MyFirstProject.	Location:	C:\MyTreasureLabProje	cts	•	Browse	
	Project will be created at	: C:\MyTreasureLabProje	ects\MyFirstProject.			
	<b>▼</b> Mor <u>e</u>		ок	Cancel	Help	
Click OK.						
	Click OK.					

Select a Dialog base pre-	oject from Step 1 and	click Next:
MFC Application Wizard - My	FirstProject	
Application Type Specify Document/View architectr application.	ure support, language, and interface	style options for your
Overview Application Type Compound Document Support Document Template Strings Database Support User Interface Features Advanced Features Generated Classes	Application type:	Project style:         Image: Windows Explorer         Image: MFC standard         Use of MFC:         Image: Use MFC in a shared DLL         Image: WFC in a static library         Opport         Image: Finish       Cancel         Help
For simplicity disable t MFC Application Wizard - My Advanced Features Specify additional support to build	he ActiveX Controls of FirstProject d into your application.	on Step 2 and click Next:
Overview Application Type Compound Document Support Document Template Strings Database Support User Interface Features Advanced Features Generated Classes	Advanced features: Context-sensitive Help WinHelp Eormat Printing and print preview Automation ActiveX controls MAPI (Messaging API) Windows sockets Active Accessibility Common Control Manifest	Number of files on recent file list:
		Finish Cancel Help
Click Finish.		

VisionLab VC++ 5.0

At this point you show From the menu select ect - Microsoft Visual C++ [d Project Build Debug Too Add Class Add Resource Add Resource Add New Item Ctrl+ Add Existing Item Shift New Folder Add Web Reference Set as StartUp Project	uld have a new project cr t  Project Settings  : lesign] - My ls Window -Shift+A t+Alt+A	eated.
MyFirstProject Properties		
In the Project Propert library directories:" e default installation it MyFirstProject Property P	ty dialog select the Linker dit box add the path to th should be located at C:\P ages	r General page. In the "Additional e library files. If you have followed the rogram Files\LabPacks\Visual C++\Lib:
Configuration: Active(Debug)	Platform: Active(Win3:	2) Configuration Manager
Configuration Properties General Debugging C/C++ C/C++ Clinker Clinker Clock Debugging System Optimization Embedded IDL Advanced Command Line Resources Browse Information Build Events Custom Build Step Custom Build Step Custom Build Step Web Deployment	Output File         Show Progress         Version         Enable Incremental Linking         Suppress Startup Banner         Ignore Import Library         Register Output         Additional Library Directories         Specifies one or more additional pathsemi-colon delimited list if more than one of the semi-colon delimited list if more than one of the semi-colon delimited list of the	\$(OutDir)/\$(ProjectName).exe Not Set Yes (/INCREMENTAL) No No No C:\Program Files\LabPacks\Visual C++\Lib  s to search for libraries; configuration specific; use one. (/LIBPATH:[dir]) Cancel Apply Help
Switch to the C/C++	Conorol page	
In the "Additional ind	clude directories:" edit bo	by add the path to the header files. If you uld be located at $C$ : Program

Files\LabPacks\Visua MyFirstProject Property Pa Configuration: Active(Debug)	l C++\Include: ges Illetform: Active(Win3	2) <u>Co</u> nfiguration Manager
Configuration Propertie ▲ General Debugging C/C++	Additional Include Directories Resolve #using References Debug Information Format Suppress Startup Banner Warning Level Detect 64-bit Portability Issues Treat Warnings As Errors	C:\Program Files\LabPacks\Visual C++\I Program Database for Edit & Continue (/ZI) Yes (/nologo) Level 3 (/W3) Yes (/Wp64) No
Browse Information Build Events Custom Build Step	Additional Include Directories Specifies one or more directories to a list if more than one. (/I[path])	add to the include path; use semi-colon delimited
Click OK.	OK	Cancel <u>Apply</u> Help
Now you have fully co	onfigured project, and ye	ou can start writing the actual code.

## Why some of the examples don't work?

VisionLab is a unique library that supports both the Win32 API's AVIFile (VFW) functions (ACM) and DirectShow. You as a developer have the ultimate choice to use either the Win32 API or DirectShow components or both at the same time.

The advantage of the Win32 API components is that hey will work on any Windows 95 and up system out of the box, however they are much less capable than the DirectShow components, and should be avoided if not necessary.

The advantage of the DirectShow components is that they will use the latest and greatest capability of DirectShow, the latest video camera devices, and TV Tuners, but they require DirectShow 9.0 or higher to be installed in order to work.

If you don't have DirectX 9.0 or higher installed on your system, you will not be able to use see the DirectShow examples working.

### Creating a simple video capture application using DirectShow

WARNING: In order to run the application in this example you must have DirectX 9.0 or higher installed!

Create and setup a new project named MotionDetect as described in the "Creating a new VisionLab project in Visual C++" chapter.



Select the components on the dialog form:

Click the "Del" key. They will be deleted from the form:



From the controls toolbar select a "Static Text" control:  $VC_{++} 6$ :  $VC_{2003/2005}$ :

VUII	VC2003/2003.				
Con 🔀		Toolbox	ф,	×	
<b>▶</b> ∰		Dialog Editor			
Aa ab		Radio Button			
[×"]		Aα Static Text			
		🔛 Picture Control			
		👁 Horizontal Scroll Bar			

Place two of them on the form, and select the first one:







October 11, 2011

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In Visual C++ 2003/2005:



On the form, select the second control:





Change the control's ID to "ID_MOTION":
Text Properties 🛛
- General Styles Extended Styles
Visible 🔽 Group 🦳 Help ID
Dis <u>a</u> bled Tab stop
Switch to the "Extended Styles" tab and check the "Client edge" property so you can easily see the control on the dialog:
Text Properties
- Ceneral Styles Extended Styles
Client edge Transparent Right aligned text
🔽 Static edge 🔽 Accept files 🔲 Right-to-left reading order
Modal frame

In Visual C++ 2003/2005:



#### On the form, select the first control:



#### In Visual C++ 6.0:

From the menu select   View   ClassWizard  :
MotionDetect - Microsoft Visual C++ -
Eile Edit View Insert Project Build Layc
🖀 😅 🖕 📶 Class <u>Wi</u> zard Ctrl+W
CMotionDeter IDE Resource Symbols
Resource Includes
E Gui Screen
Workspace Alt+0
Cutput Alt+2
Refresh Refresh
Properties Alt+Enter

In the "ClassWizard" select the "Member Variables" tab and select the "ID\_VIDEO" in the "Control IDs" list box, then press "Add Variable…":

MFC ClassWizar	d	? 🗙
Message Maps	Member Variables Automation ActiveX Events Class Info	1
<u>P</u> roject:	Class <u>n</u> ame:	Add Class 👻
MotionDetect	CMotionDetectDlg	
C:\\MotionDetec	ctDlg.h, C:\\MotionDetectDlg.cpp	
Control <u>I</u> Ds:	Type Member	<u>D</u> elete Variable
IDC_MOTION		Update <u>C</u> olumns
100_11020		Rind All
		Dina Air
J		
Description:		
	0	K Cancel

Set the variable "Category" to be "Control", and set the name to be m_Video:
Add Member Variable
Member variable name:
Category:
Variable type:
Description:
map to CStatic member
Click OK.
In the "ClassWizard" select the "Member Variables" tab and select the
"ID MOTION" in the "Control IDs" list box, then press "Add Variable":
MFC ClassWizard
Message Maps Member Variables Automation ActiveX Events Class Info
Project: Class <u>n</u> ame: Add Class
MotionDetect CMotionDetectDlg
Control [Ds: Type Member Delete Variable
IDC_VIDEO CStatic m_Video Update Columns
Bind All
Description:
OK Cancel

Set the variable "Category" to be "Control", and set the name to be m_Motion:
Add Member Variable
Member variable <u>n</u> ame: OK
Cancel
Control
Variable type:
CStatic
Description:
Click OK.
In the "Class Wizard" alielt OV
Message Maps Member Variables Automation ActiveX Events Llass info
MotionDetect CMotionDetectDlg
C:\\MotionDetectDlg.h, C:\\MotionDetectDlg.cpp
LOC MOTION CStatic m Motion Update Columns
IDC_VIDED CStatic m_Video Bind All
Description: map to CStatic member
OK Cancel

In Visual C++ 2003/2005:

E 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	•		
From the menu select   Pro	ject   Add Variable  :		
Player - Microsoft Visual C++ [design]			
Project Build Debug Profile Format			
Add Class			
🕴 🚺 Add Variable			
Add Resource			
Add Ne <u>w</u> Item Ctrl+Shift+A			
Add Existing Item Shift+Alt+A			
* New Folder			
Add Web Reference			
Set as St <u>a</u> rtUp Project			
SimpleVideoPlayer Properties			
T I CALLNE I XY	1 1 337 122 4 1 ((3.7	11	. 1 1
In the "Add Member Vari	able Wizard" set the "V	ariable type" to CSt	atic, and set the
"Variable name" to be m_	Video:		
	diD-tt		
Add member variable wizard - Mo	ononDetect		
Welcome to the Add Member V	/ariable Wizard		
This wizard adds a member variable to	your class, struct, or union.	K	
			Ý I
Access:	_		
public	Control variable		
<u>V</u> ariable type:	Control <u>I</u> D:	Category:	
CStatic	IDC_VIDEO	Control	•
Variable <u>n</u> ame:	Control type:	Ma <u>x</u> chars:	
m_Video	LTEXT		
	Min value:	Max value:	
		_	
	,h file:	.con file:	
Comment (// notation not required);	,	,	
	Fin	sh Cancel Hel	
Click Finish.			

On the form, select the se	econd control:
MotionDetect	X
Static	Static Region and the second s
From the menu select   Pr Player - Microsoft Visual C++ [design] Project Build Debug Profile Format	roject   Add Variable  :
Add Class	
Add Pasource	
Add New Them Christian	aç
Add Ivew Item Ctri+Shift+A	
AGG EXISTING RETURN DIMETRICT	
* Now Folder	
New Folder	
New Folder      Add Web Reference      Set as Start In Project	
New Folder      Add Wgb Reference      Set as StartUp Project      Simple life a Plane Presenting	
New Folder Add Wgb Reference Set as StartUp Project	
New Folder Add Wgb Reference Set as StartUp Project SimpleVideoPlayer Properties	

In the "Add Member Variable Wizard" set the "Variable type" to CStatic, and set the "Variable name" to be m Motion:						
Add Member Variable Wizard - Mo	tionDetect		×			
Welcome to the Add Member V. This wizard adds a member variable to y	ariable Wizard our class, struct, or union.		$\Diamond$			
Access:	Control variable					
Variable type: CStatic	Control ID: IDC_MOTION	Category:	•			
Variable <u>n</u> ame: m_Motion	Control type: LTEXT	Ma <u>x</u> chars:				
	Min valge:	Max valu <u>e;</u>				
	.h file:	.cpp file:				
			_			
		Finish Cancel H	telp			
Click Finish.						

Place another "Static Text" control on the form as shown on the picture:

MotionDetect		×
Static	Static	
	Static	

In Visual C++ 6.0:



In the "ClassWizard" select the "Member Va	riables" tab and select the
"ID_MOTION_LABEL" in the "Control IDs	"list box, then press "Add Variable":
MFC ClassWizard	
Message Maps Member Variables Automation ActiveX Events Class	s Info
Project: Class <u>n</u> ame:	Add Class
MotionDetect CMotionDetectDlg	Add Variable
C: \ \MotionDetectDig.n, C: \ \MotionDetectDig.cpp Control IDs: Type Member	Delete Variable
IDC_MOTION CStatic m_Motion	Update Columns
IDC_VIDED CStatic m_Video	Bind All
Description:	
·	
Set the variable "Category" to be "Control", a	and set the name to be m_MotionLabel:
Add Member Variable	
Manhaumishla nama	
Member Variable name.	
Cancel	
Variable type:	
Description:	
map to CStatic member	
Click OK	
CHOR OIX.	

In the "ClassWizard" click OK						
MFC ClassWizar	d				? 🛛	
Message Maps	Member Variables	Automation	ActiveX Events	Class Info		
Project: MotionDetect	•	Class <u>n</u> ame: CMotionDe	tectDlg	•	Add Class	
C:\\MotionDetec	tDlg.h, C:\\MotionDet	ectDlg.cpp			Add variable	
Control IDS: IDC_MOTION IDC_MOTION_LA IDC_VIDEO	BEL (	Type CStatic CStatic CStatic CStatic	Member m_Motion m_MotionLabel m_Video		Delete Variable	
Description: ma	ap to CStatic member					
				OK	Cancel	

#### In Visual C++ 2003/2005:

Change the control's ID to " Group True ID IDC_MOTION_LABEL	ID_MOTION_LABEL":
ID Specifies the identifier of the control.	
Properties 🛛 Dynamic Help	
Set the "Caption" property to	"No movement detected":
Properties 🗙	
IDC_STATIC3 (Text Control) IStatEditor 💌	
Border False	
Center Image False	

Player - Microsoft Visual C+: [design] Microsoft Visual C+: [design] Player - Microsoft Visual C+: [design] Microsoft V	From the menu select   Pro	ject   Add Variable	e  :	
Add Uses         Add Wey Beference         Strabel Reference         Add Woy Beference         Bete as Sgitub Project         Simplevidee/Byere Types         To the "Add Member Variable Wizard" set the "Variable type" to CStatic, and set the "Variable name" to be m_MotionLabel         Variable name" to be m_MotionLabel         Variable game:       Control ID:         Control ID:       Control ID:         Variable game:       Control ID:         Mix value:       Mix value:         Variable game:       Mix value:         In felt:       Control ID:         Control ID:       Mix value:         In felt:       Control IN         In felt:       Control IN         In felt:       Control IN         In felt:       Control IN	Player - Microsoft Visual C++ [design]			
Add Veriable         Strate StagtUp Project         Strate Strat	Project Build Debug Profile Format			
Add Washes Add Washes Add Washes Add Washes Sith Halt Mew Folger Add Washes Remence Sith Skill Protocol SingleWdecRlayer Properties SingleWdecRlayer Properties Modername" to be m_MotionLabel:	Add Class			
Add beguree Add beguree Set as Signiper Meet Set as Signi	7 🐞 Add Variable			
Add Mey Item Ctri+Shft+4         Add Exsting Item Shft+Ak+A         Add Exsting Item Shft+Ak+A         Add Wigg Reference         Set as StajtUp Project         SimpleWebrBayer Properties    The "Add Member Variable Wizard" set the "Variable type" to CStatic, and set the "Variable name" to be m_MotionLabel:          Add Member Variable Wizard - MotionDetect         Welcome to the Add Member Variable Wizard         This witard adds a member variable to your class, struct, or union.         Access:         Public         Control ID:         Category:         Variable Igame:         MotionLabe!         MotionLabe!         Wariable Igame:         Control Iga:         MotionLabe!         Wariable Igame:         Control Igae:         MotionLabe!         Wariable Igame:         Immoving:         Immoving:     <	Add Resource			
Add basing item Shift-AkkA         New Folder         Site Sight/Difference         Add Member Variable Wizard* set the "Variable type" to CStatic, and set the "Variable name" to be m_MotionLabel:         Member Variable Wizard - MotionDetect         Welcome to the Add Member Variable Wizard         This wizard adds a member variable to your dass, struct, or union.         Access:         public         Control Ipp:         Control Ipp:         Control Ipp:         Min value:         If file:	Add New Item Ctrl+Shift+A			
New Folger         Add Web Reference         Straplevide/Byper Project         Simplevide/Byper Project         Simplevide/Byper Project         Add Member Variable Wizard" set the "Variable type" to CStatic, and set the "Variable name" to be m_MotionLabel:         Add Member Variable Wizard - MotionDetect         Welcome to the Add Member Variable Wizard         This wizard adds a member variable Wizard         This wizard adds a member variable Wizard         Variable type:       Control ID:         Control ID:       Category:         CStatic       Control ID:         MotionLabel       Microline         Variable game:       Microline         MotionLabel       Microline         IEXT       Microline         MotionLabel       Microline         IFIE       Control type:         MotionLabel       IFIE         MotionLabel       IFIE         MotionLabel       IFIE         IFIE       Control type:         IFIE       IFIE         Control type:       IFIE         IFIE       Control type:         IFIE       IFIE         Control type:       IFIE         IFIE       IFIE         IFIE	Add Existing Item Shift+Alt+A			
Add Wigb Reference         Set as Sart/Up Project         SimpleWideoPlayer Properties             The "Add Member Variable Wizard" set the "Variable type" to CStatic, and set the "Variable name" to be m_MotionLabel:           Add Member Variable Wizard - MotionDetect         Welcome to the Add Member Variable Wizard         This wizard adds a member variable Vizard         Variable type:         Control Ip:         Category:         Variable game:         MotionLabel         Min value:         Min value:         If Ext         Min value:         If is:         Cognent (// notation not required):         Finish.	1 New Folder			
Startup Project         SimpleWidesPlayer Properties    In the "Add Member Variable Wizard" set the "Variable type" to CStatic, and set the "Variable name" to be m_MotionLabel:          Add Member Variable Wizard - MotionDetect         Welcome to the Add Member Variable Wizard         This wizard adds a member variable to your class, struct, or union.         Access:         public         Variable pame:         Control ID:         Control ID:         Control ID:         Control ID:         Control ID:         Control ID:         Max value:         ITEXT         Min value:               Tiel:            Congrent (// notation not required):               Finish         Cancel         Help	Add Web Reference			
SupplevideoRyayer Byoperties In the "Add Member Variable Wizard" set the "Variable type" to CStatic, and set the "variable name" to be m_MotionLabel:   Add Member Variable Wizard - MotionDetect   Welcome to the Add Member Variable Wizard   This wizard adds a member variable to your class, struct, or union.   Access:   public   Control [D:	Set as St <u>a</u> rtUp Project			
In the "Add Member Variable Wizard" set the "Variable type" to CStatic, and set the "Variable name" to be m_MotionLabel:          Add Member Variable Wizard - MotionDetect       Image: Control Press: Control	SimpleVideoPlayer Properties			
In the "Add Member Variable Wizard" set the "Variable type" to CStatic, and set the "Variable name" to be m_MotionLabel:          Add Member Variable Wizard - MotionDetect       Image: Control Control Control Control Control Control ID: Category: Control ID: Category: Control ID: Category: Control Control type: Mag.chars: Control type: Mag.chars: Control type: Control type: Control Control ty				
In the "Add Member Variable Wizard" set the "Variable type" to CStatic, and set the "Variable name" to be m_MotionLabel: Add Member Variable Wizard - MotionDetect       Image: Control Contr				
Add Member Variable Wizard - MotionDatect         Variable name" to be m_MotionDatect         Welcome to the Add Member Variable Wizard         This wizard adds a member variable to your class, struct, or union.         Access:         public         Costatic         Ontrol ID:         Category:         CStatic         IDC_MOTION_LABEL         Variable game:         Control type:         Max value:         h file:	In the "Add Member Vari	able Wizerd" set t	ha "Variabla typa"	' to CStatia and sat the
Add Member Variable Wizard - MotionDetect         Welcome to the Add Member Variable Wizard         This wizard adds a member variable to your class, struct, or union.         Access:         public       © Ogntrol variable         Variable type:       Control ID:         CStatic       IDC_MOTION_LABEL         Variable game:       Control type:         Min value:       Max value:         .h file:       .cpp file:	"Variable name" to be m	Motion I shale	ie vanabie type	to Ustatic, and set the
Add Member Variable Wizard - MotionDetect         Welcome to the Add Member Variable Wizard         This wizard adds a member variable to your class, struct, or union.         Access:         public          Cgntrol variable          Variable type:       Control ID:       Category:         CStatic       IDC_MOTION_LABEL       Control         Variable game:       Control type:       Max chars:         ImmotionLabel       ITEXT       Min value:         .h file:       .cgp file:       .cgp file:         .h file:       .cgp file:       .emp file:         .h file:       .cgp file:       Help	variable name to be m_1	viouonLabel		
Welcome to the Add Member Variable Wizard         This wizard adds a member variable to your class, struct, or union.         Access:         public       Control ID:         Category:         CStatic       IDC_MOTION_LABEL         Variable game:       Control type:         Min value:       Max chars:         Imm value:       Max value:	Add Member Variable Wizard - Mo	otionDetect		
Welcome to the Add Member Variable Wizard         This wizard adds a member variable to your class, struct, or union.         Access:         public       C optrol variable         yariable type:       Control ID:         Category:       Control ID:         Category:       Control ID:         Variable game:       Control type:         Min value:       Max value:         In file:       .cpp file:         .nh file:				
This wizard adds a member variable to your class, struct, or union.	Welcome to the Add Member V	Variable Wizard		
Access:         public <ul> <li>Control ID:</li> <li>Category:</li> <li>Control</li> <li>IDC_MOTION_LABEL</li> <li>Control</li> </ul> Variable name:       Control type:       Max chars:         Im_MotionLabel       LTEXT       Imax chars:         Im_MotionLabel       LTEXT       Imax chars:         Imin value:       Max value:       Imax chars:         Imin value:       Imax chars:       Imax chars:         Imin chars:	This wizard adds a member variable to	your class, struct, or union.		
Access:         public          Control ID: Category:         CStatic          IDC_MOTION_LABEL         Variable name:          Control type: Max chars:         Immodel          LTEXT         Min value:          Max value:         .htfile:          .cpp file:         .htfile:          .cpp file:         .file:          .copp file:         .file:				
Public       IC         Yariable type:       Control ID:       Category:         CStatic       IDC_MOTION_LABEL       Control         Variable name:       Control type:       Max_chars:         Im_MotionLabel       LTEXT       Max_value:         .h file:       .ccpp file:         .h file:       .ccpp file:         .min value:          .h file:       .ccpp file:             Enish       Cancel         Help       Click Finish.	Access:			
Yariable type:       Control ID:       Category:         CStatic       IDC_MOTION_LABEL       Control         Variable name:       Control type:       Max chars:         Im_MotionLabel       LTEXT       Max value:         .h file:       .cpp file:         .h file:       .cpp file:          Finish         Concel       Help	public	Control variable		
Control IDC_MOTION_LABEL Control Variable game:  Max chars:  Max value:  Min value:  Min value:  .h file: .copp file:  Comment (// notation not required):  Finish Cancel Help Click Finish.	Variable tuper	Control ID:	Catagory	
Variable name: [m_MotionLabel [TEXT [m_MotionLabel [LTEXT [LTEXT [m_MotionLabel [LTEXT				
Control type: Mag chars: m_MotionLabel   LTEXT   Min value: .h file: .cpp file: .comment (// notation not required): Finish Cancel Help Click Finish.		Control transi	Maxahara	
Comment (// notation not required):  Finish Cancel Help  Click Finish.	variable <u>n</u> ame:	LITENT	Ma <u>x</u> criars;	
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Comment (// notation not required):  Finish Cancel Help  Click Finish.				
Comment (// notation not required): Finish Cancel Help Click Finish.		.h file:	.cpp file;	
Finish Cancel Help Click Finish.	Comment (// notation not required);			
Finish Cancel Help Click Finish.				
Finish     Cancel     Help       Click Finish.				
Click Finish.			·····	I and I
Click Finish.			Einish Cancel	
Click Finish.	<u>.</u>			
	Click Finish			
	CHUK FIIIISII.			

In Visual C++ 6.0: In Select the "FileView" tab: Sel

In Visual Visual C++ 2003/2005: Select the "Solution Explorer" tab:



Double click on the "MotionDetectDlg.h":



Add the highlighted lines in the header file:

```
// MotionDetectDlg.h : header file
11
#pragma once
#include "afxwin.h"
#include <CVLImageDisplay.h>
#include <CVLDSCapture.h>
#include <CVLMotionDetect.h>
// CMotionDetectDlg dialog
class CMotionDetectDlg : public CDialog
{
// Construction
public:
     CMotionDetectDlg(CWnd* pParent = NULL); // standard
constructor
// Dialog Data
     enum { IDD = IDD_MOTIONDETECT_DIALOG };
     protected:
     virtual void DoDataExchange(CDataExchange* pDX); // DDX/DDV
support
```

```
// Implementation
protected:
                       VideoDisplay1;
    CTVLImageDisplay
    CTVLImageDisplay
                       VideoDisplay2;
    CTVLDSCapture
                       Capture;
    CTVLMotionDetect
                       MotionDetect;
protected:
    void __stdcall MotionDetected( void *sender, int max_value, POINT
&cell );
protected:
     HICON m_hIcon;
     // Generated message map functions
     virtual BOOL OnInitDialog();
     afx_msg void OnSysCommand(UINT nID, LPARAM lParam);
     afx_msg void OnPaint();
     afx_msg HCURSOR OnQueryDragIcon();
     DECLARE_MESSAGE_MAP()
public:
     CStatic m_Video;
     CStatic m_Motion;
     afx_msg void OnClose();
     CStatic m_MotionLabel;
```

Double click on the "MotionDetectDlg.cpp" file:

Solution 'MotionDetect' (1 project)

MotionDetect

MotionDetect

Source Files

Header Files

Header Files

MotionDetect.manifest

ReadMe.txt

Add the highlighted lines in the CMotionDetectDlg::OnInitDialog method:

```
BOOL CMotionDetectDlg::OnInitDialog()
{
     CDialog::OnInitDialog();
     // Add "About..." menu item to system menu.
     // IDM_ABOUTBOX must be in the system command range.
     ASSERT((IDM_ABOUTBOX & 0xFFF0) == IDM_ABOUTBOX);
     ASSERT(IDM_ABOUTBOX < 0xF000);
     CMenu* pSysMenu = GetSystemMenu(FALSE);
     if (pSysMenu != NULL)
     {
           CString strAboutMenu;
           strAboutMenu.LoadString(IDS_ABOUTBOX);
           if (!strAboutMenu.IsEmpty())
           {
                 pSysMenu->AppendMenu(MF_SEPARATOR);
                 pSysMenu->AppendMenu(MF_STRING, IDM_ABOUTBOX,
strAboutMenu);
           }
     }
     // Set the icon for this dialog. The framework does this
automatically
     // when the application's main window is not a dialog
     SetIcon(m_hIcon, TRUE);
                                        // Set big icon
     SetIcon(m_hIcon, FALSE);
                                   // Set small icon
     // TODO: Add extra initialization here
     VCL_InitControls( m_hWnd );
     VideoDisplay1.Open( m_Video.m_hWnd );
     VideoDisplay2.Open( m_Motion.m_hWnd );
     Capture.OutputPin.Connect( VideoDisplay1.InputPin );
     Capture.OutputPin.Connect( MotionDetect.InputPin );
```

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Add the following method in the "MotionDetectDlg.cpp" file:



In Visual C++ 6.0:

From the menu select   View   ClassWizard  :
🊧 MotionDetect - Microsoft Visual C++ -
E File Edit View Insert Project Build Layo
🖀 🚘 🖕 🛣 Class <u>Wi</u> zard Ctrl+W
CMotionDeter IDE Resource Symbols
Resource Includes
E G Koti E Full Screen
Workspace Alt+0
Cutput Alt+2
E Debug Windows
Properties Alt+Enter

From the "Message Maps" tab select the CMotionDetectDlg and double click on the WM\_COLSE Message:

Message Maps   Member Variables   Automation   ActiveX Events   Class Info
Project:       Class name:       Add Class ▼         MotionDetect       CMotionDetectDlg       ▲dd Function         C:\\MotionDetectDlg.h, C:\\MotionDetectDlg.cpp       ▲dd Function         Object [Ds:       Messages:       Delete Function         IDC_MOTION_LABEL       WinHelp       ▲dd Class ▼         IDC_MOTION_LABEL       WinHelp       ▲dd Class ▼         UDC_VIDEO       WinHelp       ▲dd Function
Member functions:
V       DoDataExchange       ▲         W       OnInitDialog       ON_WM_INITDIALOG         W       OnPaint       ON_WM_PAINT         W       OnQueryDragIcon       ON_WM_QUERYDRAGICON         W       OnSvsCommand       ON_WM_SYSCOMMAND
Description: Signals a window or application to terminate
OK Cancel

A new message handler w	vill be created:		
MFC ClassWizard		? 🔀	
Message Maps Member Variables Au	tomation   ActiveX Events   Class Info	1	
Project: MotionDetect C.\\MotionDetectDlg.h, C.\\MotionDetectI Object IDs: CMotionDetectDlg IDC_MOTION IDC_MOTION_LABEL IDC_VIDE0	Class name: CMotionDetectDIg DIg.cpp Messages: WinHelp WM_CANCELMODE WM_CAPTURECHANGED WM_CHAR WM_CHAR WM_CLASE W	Add Class  Add Function Delete Function Edit Code	
Wember functions:           V         DoD ataExchange           W         OnClose         ON_WM_CLO           W         OnlinitDialog         ON_WM_INIT           W         OnPaint         ON_WM_PAIL           W         OnQueryDradicon         ON_WM OUE           Description:         Signals a window or application	ISE DIALOG NT ERYDRAGICON		
Click OK to close the form	n	DK Cancel	

In Visual C++ 2003/2005:



Add the highlighted line in the CMotionDetectDlg::OnClose method:

void	CMotionDetectDlg::OnClose()
{	
	// TODO: Add your message handler code here and/or call default
	Capture.Stop();
	CDialog::OnClose();
}	

Compile and run the application. You should see the two displays like shown on the picture. The first display will show the input of the camera, and the second will show the last frame where there was a movement detected:



The label will report the location of the last detected movement.

Congratulations! You have just created your first Motion Detection application. Here are the OpenWire connections in this application:



## Creating a simple contour detection application

Create and setup a new project named ContourDetect as described in the "Creating a new VisionLab project in Visual C++" chapter.

ContourDetect

Select the components on the dialog form:

October 11, 2011

VisionLab VC++ 5.0

Click the "Del" key. They will be deleted from the form:

		······································	
_	Ĩ	ContourDetect	
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From the controls toolbar select a "Static Text" control: VC++ 6: VC2003/2005:

С
E

Place two of them on the form and select the first one:



In Visual C++ 6.0:

From the menu select   View   Properties  :
Eile Edit View Insert Project Build Layo
The Class Wizard Ctrl+W
CContourDete ID= Resource Symbols
Workspace Alt+0
Qutput Alt+2
Debug Windows
Change the control's ID to "ID_VIDEODISPLAY":
Text Properties
ID: ID_VIDEODISPLAY Caption: Static
✓ Visible     ✓ Group     □ Help ID
Switch to the "Extended Styles" tab and check the "Client edge" property so you can
easily see the control on the dialog:
Text Properties
- 🖓 💡 General Styles Extended Styles
Client edge Transparent Right aligned text
Static edge Accept files Bight-to-left reading order
Modal frame
From the mean of the Uline Class Wine d
From the menu select   View   Class wizard  :

-37-

In Visual C++ 2003/2005:

Change the	control's ID to "ID VIDEODISPLAY".
Group	True
ID	IDC_VIDEODISPLAY
Tabstop	False
ID Specifies the identifient of	er of the control.
Set the "Cli	ent Edge" property to True so you can easily see the control on the dialog:
Properties	
IDC_VIDEODISPL	AY1 (Text Control) ISt 🔽
1	
Center Image	Ealse A
Client Edge	True V
End Ellipsis	False
Modal Erama	Estra
Change the	controll's ID to "ID CONTOUDS".
Change the	
Group	True
ID	
ID Spacifies the identifi	ar of the control
specifies the identition	er of the control.
Properties 2	Dynamic Help
Set the "Cli	ent Edge" property to True so you can easily see the control on the dialog
Properties	
DE 2+ 😐 🏏	
Center Image	False
End Ellipsis	False
Modal Frame	False

On the form, select the second control:

ContourDetect		×
Static	Static	

In Visual C++ 6.0:

From the menu select   View   Properties  :
ContourDetect - Microsoft Visual C++
Eile Edit View Insert Project Build Layo
E Class <u>Wizard</u> Ctrl+W
CContourDete ID= Resource Symbols
Resource Includes
Workspace Alt+0
Debug Windows
₩ Ø Refresh
Change the control's ID to "ID_CONTOURS".
Text Properties
- A Ceneral Styles Extended Styles
IDC_CONTOURS Caption: Static
Visible 🔽 Group 🗖 Help ID
🔽 Disabled 🔲 Tab stop
Switch to the "Extended Styles" teb and check the "Client edge" property so you can
switch to the Extended Styles tab and check the Chefit edge property so you can
Tout Properties
Here Properties
Client edge Transparent Right aligned text
Static edge Accept files Right-to-left reading order
Modal frame

From the menu select   View   ClassWizard  : ContourDetect - Microsoft Visual C++ File Edt View Insert Project Build Lave Resource Symbols Resource Includes Full Screen Workspace Alk+0 Qutput Alk+2 Debug Windows Refrest Properties Alk+Enter	
In the "ClassWizard" select the "Member Variables" tab and select the "ID CONTOURS" in the "Control IDs" list box, then press "Add Variable": MFC ClassWizard Message Maps Member Variables Automation ActiveX Events Class Info Project Class name: ContourDetect Class name: ContourDetectDig h, C: \ContourDetectDig cpp Control [Ds: Type Member Peter Variable IDC_VIDEODISPLAY Bind All Bind All	

Add Member Variable Member Variable game: m_Contous Sategony: Control Variable type: Cstaic Description: map to CStaic member Description: map to CStaic member Click OK. In the "Class Wizard" select the "Member Variables" tab and select the "ID_VIDEODISPLAY" in the "Control IDs" list box, then press "Add Variable": <u>MFC ClassWizard</u> Member Variables Automation ActiveCEvents Class Info Project Variable Control Description: <u>Description</u> <u>Description</u> <u>Description</u> <u>Control Description</u> <u>Control Description</u> <u>Description</u> <u>Description</u> <u>Description</u> <u>Description</u> <u>Description</u> <u>Description</u> <u>Description</u> <u>Description</u> <u>Description</u> <u>Description</u>	Set the variable "Category" to be "Control", and set the name to be m_Contours:
Click OK. In the "ClassWizard" select the "Member Variables" tab and select the "ID_VIDEODISPLAY" in the "Control IDs" list box, then press "Add Variable": MFC ClassWizard Project ContouDetectDlg Add Variables ContouDetectDlg, CAVContourDetectDlg ContouDetectDlg, CAVContourDetectDlg.cpp Contoul DetectDlg, CAVContourDetectDlg.cpp Contours Update Columns Bind All Bind All OK Cancel	Add Member Variable   Member variable pame:   Mc   m_Contours   Cancel   Category:   Control   Variable type:   CStatic   Description:   map to CStatic member
	In the "ClassWizard" select the "Member Variables" tab and select the "ID_VIDEODISPLAY" in the "Control IDs" list box, then press "Add Variable": MFC ClassWizard Message Maps Member Variables Automation ActiveX Events Class Info Project ContourDetect Class game: ContourDetect Class game: ContourDetectClig to ContourDetectDlg Add Class Add Class Add Class Add Class Add Class Member Project Variable Control Description: Description: OK Cancel

Set the variable "Category" to be "Control", and set the name	e to be m_VideoDisplay:
Add Member Variable	
Member variable <u>n</u> ame: m_VideoDisplay Category: Control Variable type: CStatic	
Description: map to CStatic member Click OK.	
In the "ClassWizard" click OK	
MFC ClassWizard	
Message Maps       Member Variables       Automation       ActiveX Events       Class Info         Project:       Class name:       Add Class          ContourDetect       CContourDetectDlg       Add Class          C\\ContourDetectDlg.h, C\\ContourDetectDlg.cpp       Add Variable         Control [Ds:       Type       Member         IDC_CONTOURS       CStatic       m_Contours         IDC_VIDEODISPLAY       CStatic       m_VideoDisplay         Bind All       Bind All	
Description: map to CStatic member	
OK Cancel	

In Visual C++ 2003/2005:

III VISual C++ 2005/2005.			1
From the menu select   Pro	ject   Add Variable  :		
Player - Microsoft Visual C++ [design]			
Project Build Debug Profile Format			
Add Class			
👎 🐞 Add Varia <u>b</u> le			
Add Resource			
Add New Item Ctrl+Shift+A			
Add Existing Item Shift+Alt+A			
* New Folder			
Add Web Reference			
Set as St <u>a</u> rtUp Project			
🖻 SimpleVideoPlayer <u>P</u> roperties			
<b>X</b> .1	1 1 1 1 1 ((1 )		1 1
In the "Add Member Varia	able Wizard" set the "V	ariable type" to CStatic	e, and set the
"Variable name" to be m_	VideoDisplay:		
Child Manalass Wastishis Wissed. Co	D-A		
Add Member Variable Wizard - Co	ntourDetect		
Welcome to the Add Member V	/ariable Wizard		
This wizard adds a member variable to	your class, struct, or union.		
		N/	
Access:	_		
public	Control variable		
<u>V</u> ariable type:	Control <u>I</u> D:	Category:	
CStatic	IDC_VIDEODISPLAY	Control	]
Variable <u>n</u> ame:	Control type:	Ma <u>x</u> chars:	
m_VideoDisplay	LTEXT		
	Min value:	Max value:	
			-
	h file:	con file:	
	11 [1997		1
Comment (// notation not required):	,		
	Fini	ch Cancel Help	1
Click Finish			

From the menu select   Project   Add Variable  :
Player - Microsoft Visual C++ [design]
Project Build Debug Profile Format
Add Class
Add Variable
Add Resource
Add New Item Ctrl+Shift+A
Add Existing Item Shift+Alt+A
New Folder P
Add Web Reference
Set as StartUp Project
SimpleVideoPlayer Properties
In the "Add Member Variable Wizard" set the "Variable type" to CStatic, and set the
"Variable name" to be m Contrours:
Add Member Variable Wizard - ContourDetect
Welcome to the Add Member Variable Wizard
This wizard adds a member variable to your class, struct, or union.
Arcess:
nublic V Control variable
Variable type: Control ID: Category:
CStatic IDC_CONTOURS Control
Variable name: Control type: Max chars:
m_Contours LTEXT
Min valge; Max valug;
.h file: .cpp file:
Comment (// notation not required):
Exist Const Uth
Click Finish
// ContourDetectDlg.h : header file
#pragma once
#include "afxwin.h"

VisionLab VC++ 5.0

```
#include <CVLImageDisplay.h>
#include <CVLCanny.h>
#include <CVLFindContours.h>
// CContourDetectDlg dialog
class CContourDetectDlg : public CDialog
{
// Construction
public:
     CContourDetectDlg(CWnd* pParent = NULL); // standard
constructor
// Dialog Data
     enum { IDD = IDD_CONTOURDETECT_DIALOG };
     protected:
     virtual void DoDataExchange(CDataExchange* pDX); // DDX/DDV
support
// Implementation
protected:
     CTVLAVIPlayer
                       AVIPlayer;
     CTVLImageDisplay VideoDisplay;
     CTVLCanny
                       Canny;
     CTVLFindContours FindContours;
     CTVLImageDisplay ContoursDisplay;
protected:
     void __stdcall ContoursFound( void *sender, void *_contours );
protected:
     HICON m_hIcon;
     // Generated message map functions
     virtual BOOL OnInitDialog();
     afx_msg void OnSysCommand(UINT nID, LPARAM lParam);
```

```
afx_msg void OnPaint();
afx_msg HCURSOR OnQueryDragIcon();
DECLARE_MESSAGE_MAP()
public:
CStatic m_VideoDisplay;
CStatic m_Contours;
```

```
BOOL CContourDetectDlg::OnInitDialog()
{
     CDialog::OnInitDialog();
     // Add "About..." menu item to system menu.
     // IDM_ABOUTBOX must be in the system command range.
     ASSERT((IDM_ABOUTBOX & 0xFFF0) == IDM_ABOUTBOX);
     ASSERT(IDM_ABOUTBOX < 0xF000);
     CMenu* pSysMenu = GetSystemMenu(FALSE);
     if (pSysMenu != NULL)
     {
           CString strAboutMenu;
           strAboutMenu.LoadString(IDS_ABOUTBOX);
           if (!strAboutMenu.IsEmpty())
           {
                 pSysMenu->AppendMenu(MF_SEPARATOR);
                 pSysMenu->AppendMenu(MF_STRING, IDM_ABOUTBOX,
strAboutMenu);
           }
     }
     // Set the icon for this dialog. The framework does this
automatically
     // when the application's main window is not a dialog
     SetIcon(m_hIcon, TRUE);
                                        // Set big icon
     SetIcon(m_hIcon, FALSE);
                                       // Set small icon
```

```
// TODO: Add extra initialization here
```

VCL\_InitControls( m\_hWnd );

VideoDisplay.Open( m\_VideoDisplay.m\_hWnd );

ContoursDisplay.Open( m\_Contours.m\_hWnd );

```
AVIPlayer.FileName = "C:\\Program Files\\LabPacks\\Visual C+
+\\Demos\\AVIFiles\\V0206-indeo3.2.avi";
```

AVIPlayer.OutputPin.Connect( VideoDisplay.InputPin );

AVIPlayer.OutputPin.Connect( Canny.InputPin );

Canny.OutputPin.Connect( FindContours.InputPin );

FindContours.OnContours.Set( this, &CContourDetectDlg::ContoursFound );

FindContours.SynchronizeType = stSingleBuffer;

VCL\_Loaded();

```
return TRUE; // return TRUE unless you set the focus to a control % \mathcal{T}_{\mathrm{CONT}}
```

```
Add the following method in the "MotionDetectDlg.cpp" file:
```

```
void __stdcall CContourDetectDlg::ContoursFound( void *sender, void
*_contours )
{
    CTVLContours Contours( _contours );
    CBitmap Image;
    Image.CreateBitmap( 240, 180, 1, 32, NULL );
    CPaintDC dc(this); // device context for painting
    CDC AnotherDC;
    AnotherDC.CreateCompatibleDC( &dc );
    AnotherDC.SelectObject( Image );
    CPen RedPen;
    RedPen.CreatePen(PS_SOLID, 1, RGB( 255, 0, 0));
```

```
CPen GreenPen;
     GreenPen.CreatePen(PS_SOLID, 1, RGB( 0, 127, 0 ));
     CPen BluePen;
     BluePen.CreatePen(PS_SOLID, 1, RGB( 0, 0, 255 ));
     AnotherDC.FillSolidRect(0,0,240,180, RGB( 255, 255, 255) );
     for( int i = 0; i < Contours.Count; i ++ )</pre>
     {
           CTVLContour Contour = Contours.Items[ i ];
           if( Contour.ContourType == ctOuter )
                 AnotherDC.SelectObject( &GreenPen );
           else
                 AnotherDC.SelectObject( &BluePen );
           for( int j = 0; j < Contour.Count; j ++ )</pre>
           {
                 if( j == 0 )
                       AnotherDC.MoveTo( Contour.Items[ j ].x,
Contour.Items[ j ].y );
                 else
                       AnotherDC.LineTo( Contour.Items[ j ].x,
Contour.Items[ j ].y );
           }
     }
     AnotherDC.SelectObject( &RedPen );
     LOGBRUSH logBrush;
     logBrush.lbStyle = BS_HOLLOW;
     logBrush.lbColor = 0;
     logBrush.lbHatch = 0;
```

#### Compile and run the application.

You should see the contours and the bounding rectangles drawn:



Here are the OpenWire connections in this application:



## Using the TSLCRealBuffer in C++ Builder and Visual C++

The C++ Builder version of the library comes with a powerful data buffer class, called TSLCRealBuffer.

The TSLCRealBuffer is capable of performing basic math operations over the data as well as some basic signal processing functions. The data buffer also uses copy on write algorithm improving dramatically the application performance.

The TSLCRealBuffer is an essential part of the SignalLab generators and filters, but it can be used independently in your code.

You have seen already some examples of using TSLCRealBuffer in the previous chapters. Here we will go into a little bit more details about how TSLCRealBuffer can be used.

In order to use TSLCRealBuffer you must include SLCRealBuffer.h directly or indirectly (trough another include file):

#include <SLCRealBuffer.h>

Once the file is included you can declare a buffer: Here is how you can declare a 1024 samples buffer: TSLCRealBuffer Buffer( 1024 );

Version 4.0 and up does not require the usage of data access objects. The data objects are now obsolete and have been removed from the library.

You can obtain the current size of a buffer by calling the GetSize method: Int ASize = Buffer.GetSize(); // Obtains the size of the buffers

You can resize (change the size of) a buffer: Buffer.Resize( 2048 ); // Changes the size to 2048

You can set all of the elements (samples) of the buffer to a value: Buffer.Set( 30 ); // Sets all of the elements to 30.

You can access individual elements (samples) in the buffer: Buffer [ 5 ] = 3.7; // Sets the fifth elment to 3.7 Double AValue = Buffer [ 5 ]; // Assigns the fifth element to a variable

You can obtain read, write or modify pointer to the buffer data:

const double \*data = Buffer.Read() // Starts reading only
double \*data = Buffer.Write()// Starts writing only
double \*data = Buffer.Modify()// Starts reading and writing

Sometimes you need a very fast way of accessing the buffer items. In this case, you can obtain a direct pointer to the internal data buffer. The buffer is based on copy on write technology for high performance. The mechanism is encapsulated inside the buffer, so when working with individual items you don't have to worry about it. If you want to

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access the internal buffer for speed however, you will have to specify up front if you are planning to modify the data or just to read it. The TSLCRealBuffer has 3 methods for accessing the data Read(), Write(), and Modify (). Read() will return a constant pointer to the data. You should use this method when you don't intend to modify the data and just need to read it. If you want to create new data from scratch and don't intend to preserve the existing buffer data, use Write(). If you need to modify the data you should use Modify (). Modify () returns a non constant pointer to the data, but often works slower than Read() or Write(). Here are some examples:

```
const double *pcData = Buffer.Read(); // read only data pointer
double Value = *pcData; // OK!
*pcData = 3.5; // Wrong!
double *pData = Buffer.Write(); // generic data pointer
double Value = *pData; // OK!
*pData = 3.5; // OK!
```

You can assign one buffer to another:

Buffer1 = Buffer2;

You car	do l	basic	buffer	arithmetic <sup>.</sup>
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TSLCRealBuffer Buffer1( 1024 );
TSLCRealBuffer Buffer2( 1024 );
TSLCRealBuffer Buffer3( 1024 );
Buffer1.Set( 20.5 );
Buffer2.Set( 5 );
Buffer3 = Buffer1 + Buffer2;
Buffer3 = Buffer1 - Buffer2;
Buffer3 = Buffer1 * Buffer2;
Buffer3 = Buffer1 / Buffer2;

In this example the elements of the Buffer3 will be result of the operation (+,-,\* or /) between the corresponding elements of Buffer1 and Buffer2.

You can add, subtract, multiply or divide by constant: // Adds 4.5 to each element of the buffer

// Adds 4.5 to each element of the but

Buffer1 = Buffer2 + 4.5;

```
// Subtracts 4.5 to each element of the buffer
Buffer1 = Buffer2 - 4.5;
// Multiplies the elements by 4.5
Buffer1 = Buffer2 * 4.5;
// Divides the elements by 4.5
Buffer1 = Buffer2 / 4.5;
```

You can do "in place" operations as well:

```
Buffer1 += Buffer2;
Buffer1 += 4.5;
Buffer1 -= Buffer2;
Buffer1 -= 4.5;
Buffer1 *= Buffer2;
Buffer1 *= 4.5;
Buffer1 /= Buffer2;
Buffer1 /= Buffer2;
```

Those are just some of the basic buffer operations provided by SignalLab.

If you are planning to use some of the more advanced features of TSLCRealBuffer please refer to the online help.

SignalLab also provides TSLCComplexBuffer and TSLCIntegerBuffer. They work similar to the TSLCRealBuffer but are intended to be used with Complex and Integer data. For more information on TSLCComplexBuffer and TSLCIntegerBuffer please refer to the online help.

## **Distributing your application**

Once you have finished the development of your application you most likely will need to distribute it to other systems. In order for the built application to work, you will have to include a set of DLL files together with the distribution. The necessary files can be found under the [install path]\DLL directory( [install path] is the location where the library was installed).

You can distribute them to the [Windows]\System32 ([Windows]\SysWOW64 in 64 bit Windows) directory, or to the distribution directory of your application( [Windows] is the Windows directory - usually C:\WINNT or C:\WINDOWS ).

## Deploying your application with the IPP DLLs

The application will work, however the performance can be improved by also copying the Intel IPP DLLs provided with the library.

The DLLs are under the [install path]\LabPacks\IppDLL directory( [install path] is the location where the library was installed).

In 32 bit Windows to deploy IPP, copy the files to the [Windows]\System32 directory on the target system.

In 64 bit Windows to deploy IPP, copy the files to the [Windows]\SysWOW64 directory on the target system.

[Windows] is the Windows directory - usually C:\WINNT or C:\WINDOWS This will improve the performance of your application on the target system.