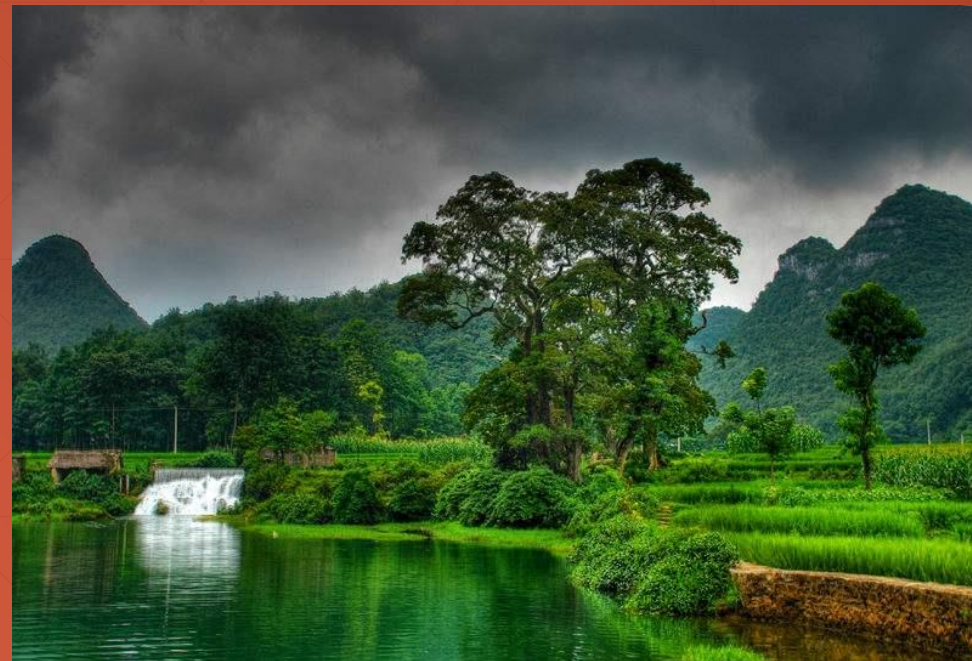


UWP 系列之七



聊聊UWP控件相关的话题

北京理工大学计算机学院
金旭亮



UWP原生控件

UWP平台内置控件

UWP原生控件的特点



遵循Fluent设计原则设计出来，有统一风格。



不仅仅支持鼠标和键盘，还支持触控、手势和手写笔输入等新的人机交互方式。



只能运行于Windows 10平台之上。

实例：TextBox

```
<TextBox Name="SampleTextBox"
  Height="50" Width="500"
  FontSize="36" FontFamily="Segoe UI"
  PlaceholderText="Try taping with your pen"
  IsHandwritingViewEnabled="False">
</TextBox>
```

此属性设置是否开启手写
输入与识别功能

New line Cross out Insert space

Scratch
out Join Overwrite

支持的手写标记

lortarl lost art lout art

开启了手写识别
特性的文本框



WinUI

UWP开发团队官方维护的UI控件库



WinUI

包容一堆UWP组件

这堆组件用上了win10新
版本的技术特性

这些组件在针对老版本
Win10的UWP应用中可以使用

UWP团队负责开发



Android兼容包

包容一堆Android组件

这堆组件用上了Android
新版本提供的技术特性

这些组件在针对老版本Android
的手机应用中可以使用

Android官方团队负责开发

WinUI源码网址

`http://aka.ms/winui`

The screenshot shows the GitHub repository for 'microsoft-ui-xaml' by Microsoft. The repository has 130 watchers, 1,603 stars, and 149 forks. It includes tabs for Code, Issues (401), Pull requests (10), Projects (10), Security, and Insights. The description states it is the 'Windows UI Library: the latest Windows 10 native controls and Fluent styles for your applications'. Below this are tags for desktop, windows, xaml, fluent-design, csharp, cpp, windows-10, uwp, and winui. A progress bar shows 465 commits, 176 branches, 15 releases, and 38 contributors, with a MIT license. At the bottom, there is a table of recent commits.

Commit	Message	Time
chingucoding and kaiguo	Added RevealStyle for DropDownButton and SplitButton; Closes #70; (#1211)	15 hours ago
.github	Update Min OS Version for MUX to RS2 (#977)	2 months ago
.vscode	Change from insider SDK to public 18362 SDK (#651)	4 months ago
build	use xaml queues (#1221)	2 days ago

了解WinUI



你已拥有此应用。

安装

...



XAML Controls Gallery

Microsoft Corporation • [开发人员工具](#)

共享 愿望清单

★★★★★ 17

This app demonstrates all of the Xaml and Windows UI library controls available to make a Fluent Windows 10 app. It's the interactive companion to the Fluent Design System web site:

[更多](#)



3+

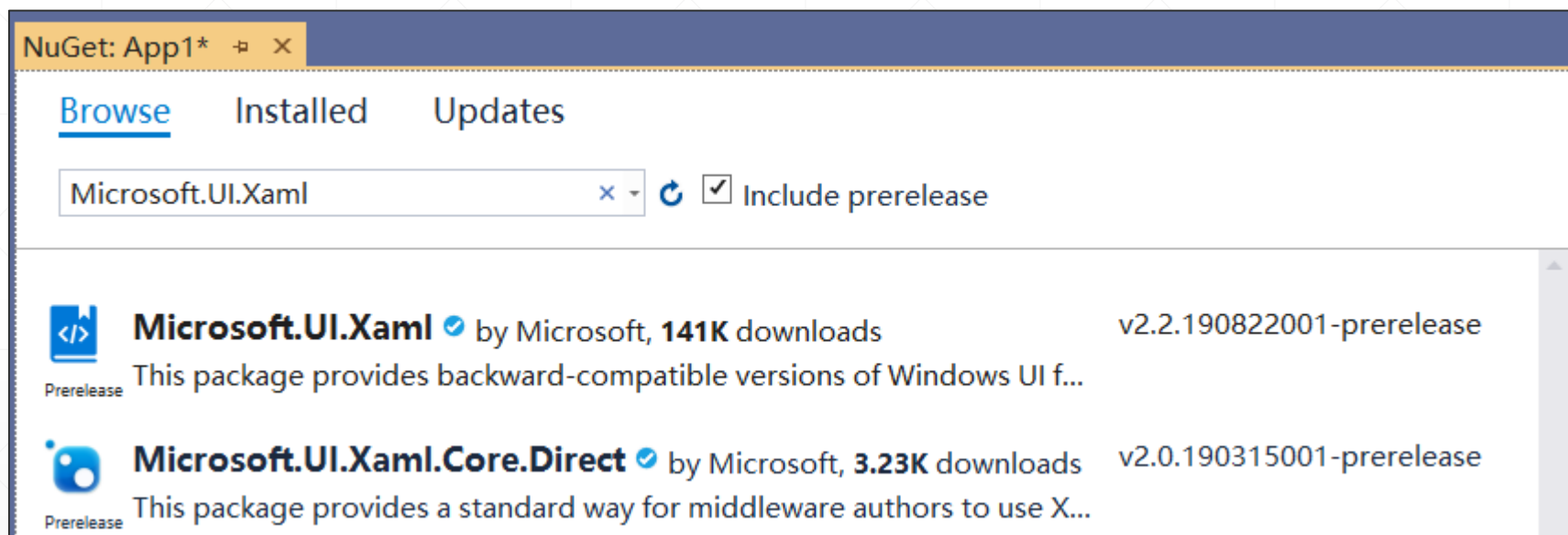
你可以在 Xbox One 主机上购买。(你所在的地区不支持通过 microsoft.com 购买。)



XAML Controls Gallery的运行截图

在UWP应用中使用WinUI

1 使用NuGet搜索“Microsoft.UI.Xaml”，给项目添加引用：



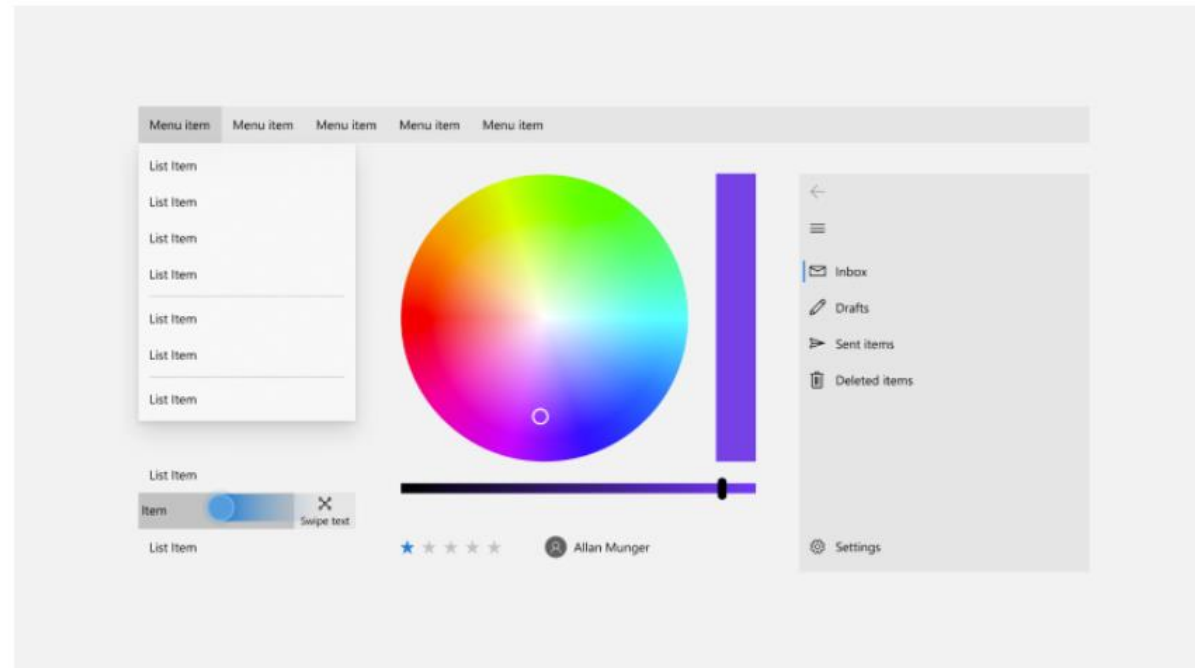
2 完成之后，在Xaml中声明相应的命名空间即可使用。

官方文档

<https://docs.microsoft.com/zh-cn/uwp/toolkits/winui/>

Windows UI Library

2018/10/02 • 2 分钟阅读时长 • 2 人 1 人 1 人

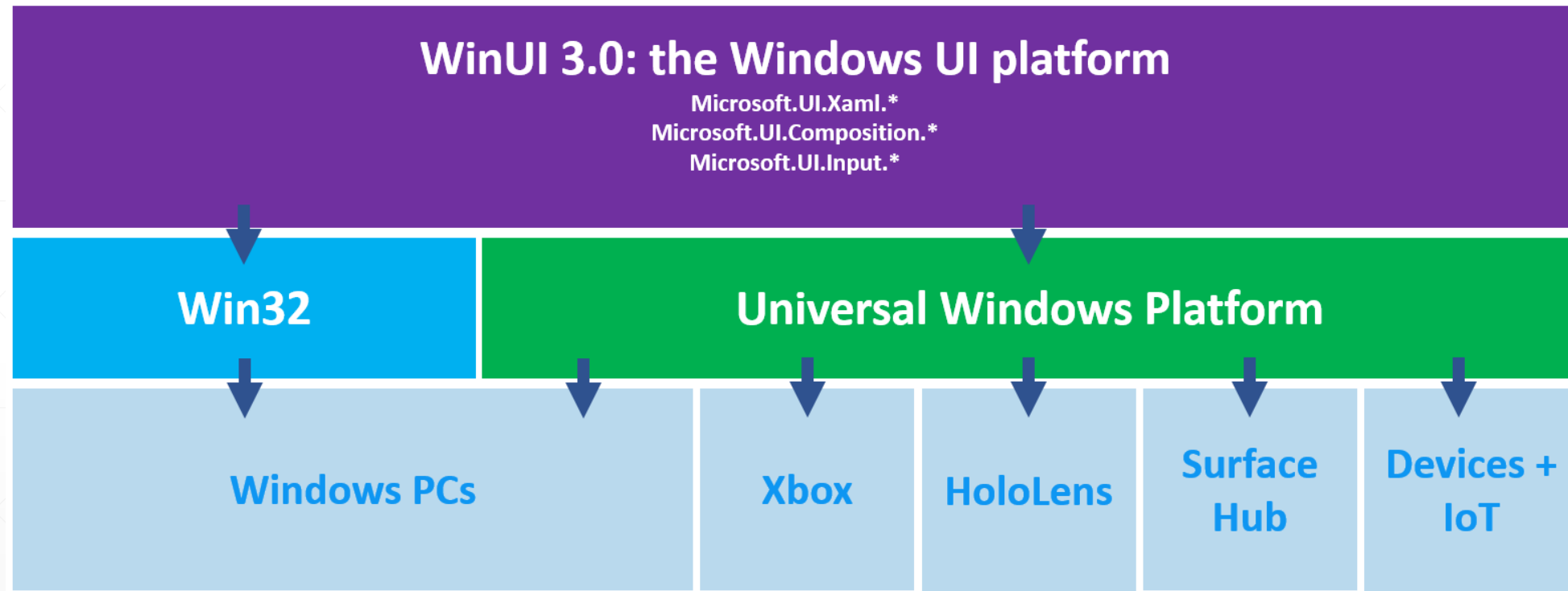


The Windows UI Library provides official native Windows UI controls and other user interface elements for UWP apps.

It maintains down-level compatibility with earlier versions of Windows 10, so your app works even if users don't have the latest OS.

在官方文档中包容使用WinUI的详细步骤

WinUI架构



<https://github.com/microsoft/microsoft-ui-xaml/blob/master/docs/roadmap.md>



Windows Community ToolKits

UWP社区贡献的一个非常Cool的开源项目

Windows Community Toolkit是什么?

<https://github.com/windows-toolkit/WindowsCommunityToolkit>

 windows-toolkit / WindowsCommunityToolkit

 Watch

354

 Star

3,166

 Fork

877

包容以下三部分内容

辅助函数
(Helper Functions)

自定义控件
(custom controls)

应用程序服务
(app service)

可用于UWP应用开发中

了解Windows Community Toolkit的特点

Supported SDKs

- Fall Creators Update (16299)
- April 2018 Update (17134)
- October 2018 Update (17763)



ToolKit当前版本支持的Windows 10 SDK版本

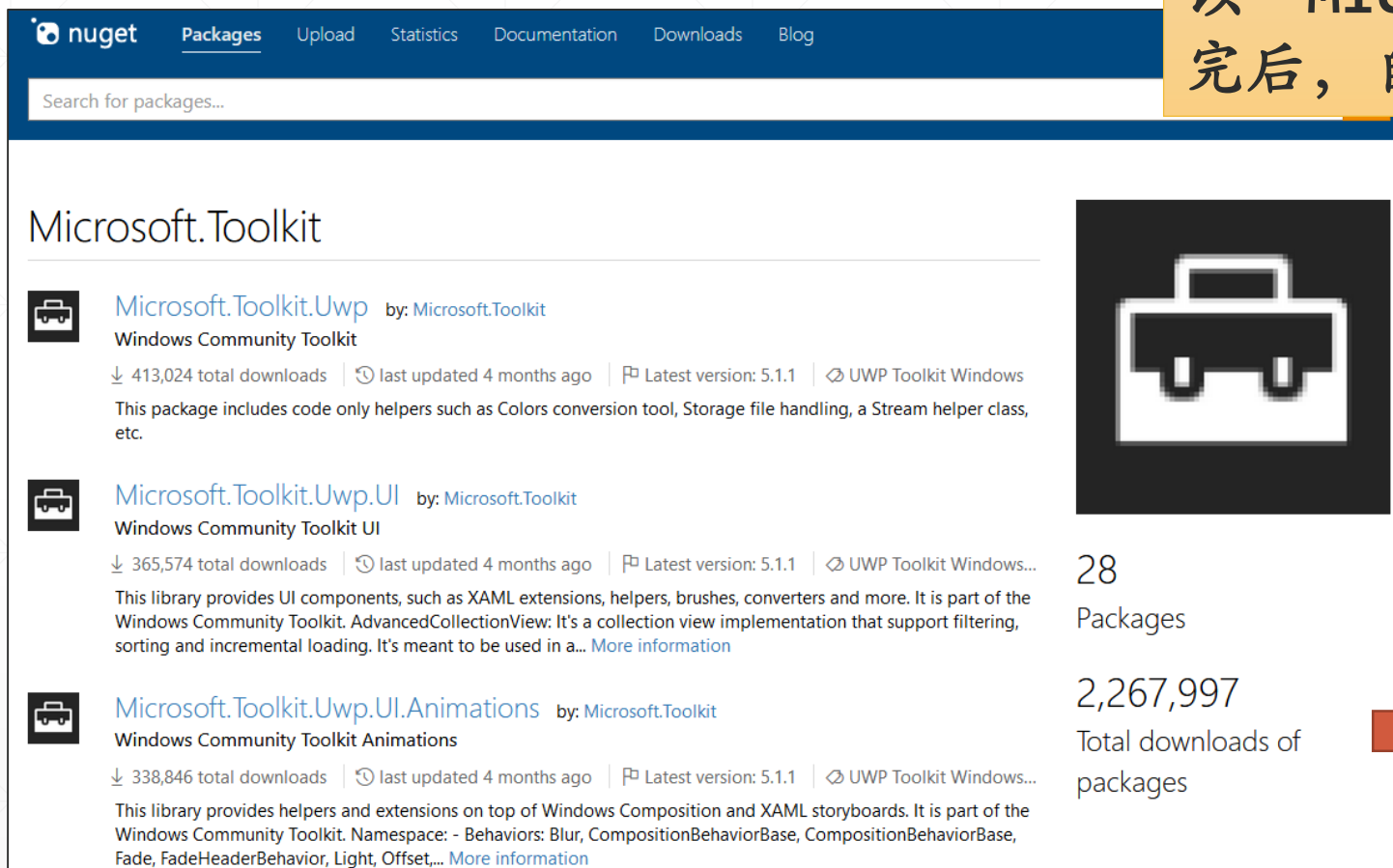
Principles

- Principle #1: The toolkit will be kept simple.
- Principle #2: As soon as a comparable feature is available in the Windows SDK for Windows 10, it will be marked as deprecated.
- Principle #3: All features will be supported for two Windows SDK for Windows 10 release cycles or until another principle supersedes it.

上述第2条原则说明，Community Toolkit是微软官方提供的Windows SDK的“补集”，所以你可以把它看成是一个UWP新控件“试验场”。

如何使用?

Windows Community Toolkit中的相关组件，可以通过Nuget安装，其包名以“Microsoft.Toolkit”打头，安装完后，自动出现在VS的工具箱中。



The screenshot shows the NuGet website interface. At the top is a navigation bar with links: nuget, Packages, Upload, Statistics, Documentation, Downloads, and Blog. Below the navigation bar is a search bar labeled "Search for packages...". The main content area displays the "Microsoft.Toolkit" package page. It lists three packages: "Microsoft.Toolkit.Uwp", "Microsoft.Toolkit.Uwp.UI", and "Microsoft.Toolkit.Uwp.UI.Animations". Each package entry includes a brief description, download statistics, and version information. To the right of the package list, there is a large black square icon with a white briefcase symbol inside. Below this icon, the text "28 Packages" and "2,267,997 Total downloads of packages" is displayed. A large red arrow points from this text towards the right side of the image.

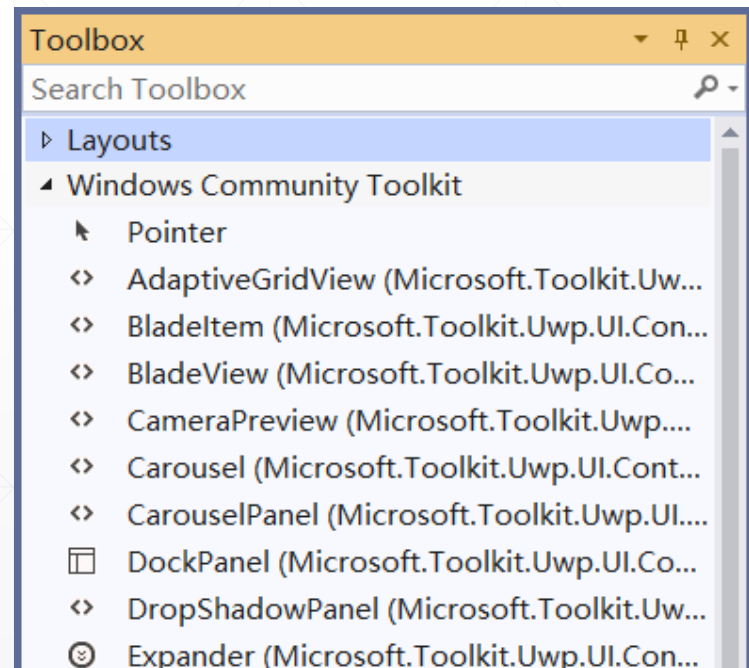
Microsoft.Toolkit

Microsoft.Toolkit.Uwp by: Microsoft.Toolkit
Windows Community Toolkit
413,024 total downloads | last updated 4 months ago | Latest version: 5.1.1 | UWP Toolkit Windows
This package includes code only helpers such as Colors conversion tool, Storage file handling, a Stream helper class, etc.

Microsoft.Toolkit.Uwp.UI by: Microsoft.Toolkit
Windows Community Toolkit UI
365,574 total downloads | last updated 4 months ago | Latest version: 5.1.1 | UWP Toolkit Windows...
This library provides UI components, such as XAML extensions, helpers, brushes, converters and more. It is part of the Windows Community Toolkit. AdvancedCollectionView: It's a collection view implementation that support filtering, sorting and incremental loading. It's meant to be used in a... [More information](#)

Microsoft.Toolkit.Uwp.UI.Animations by: Microsoft.Toolkit
Windows Community Toolkit Animations
338,846 total downloads | last updated 4 months ago | Latest version: 5.1.1 | UWP Toolkit Windows...
This library provides helpers and extensions on top of Windows Composition and XAML storyboards. It is part of the Windows Community Toolkit. Namespace: - Behaviors: Blur, CompositionBehaviorBase, CompositionBehaviorBase, Fade, FadeHeaderBehavior, Light, Offset,... [More information](#)

28 Packages
2,267,997 Total downloads of packages



官方文档

<https://docs.microsoft.com/zh-cn/windows/communitytoolkit/>

Docs / Windows / Windows Community Toolkit / Windows Community Toolkit Documentation

反馈 编辑 共享

按标题筛选

Windows Community Toolkit Documentation

> Setup

> Controls

> Animations

> Brushes

> Extensions

> Helpers

> Services

Windows Community Toolkit Documentation


2018/08/08 • 2 分钟阅读时长 • 

The Windows Community Toolkit is a collection of helper functions, custom controls, and app services. It simplifies and demonstrates common developer tasks building UWP apps for Windows 10.

The toolkit can be used to build apps for any Windows 10 device, including PC, Mobile, Xbox, IoT and HoloLens. You can also use the toolkit with an existing desktop app converted to UWP using the Desktop Bridge.

一个直观了解Community Toolkit的App

想了解它提供了些什么东西，最佳的方式就是安装以下App：




Windows Community Toolkit Sample App

Microsoft Corporation • [开发人员工具](#)

♥ 愿望清单

★★★★★ 29

Sample app for developers that demonstrates the custom controls, app services and helper functions in the Windows Community Toolkit. The toolkit and the sample app are open-sourced in the .NET Foundation and available on GitHub at <http://aka.ms/windowstoolkit>

 3+

免费

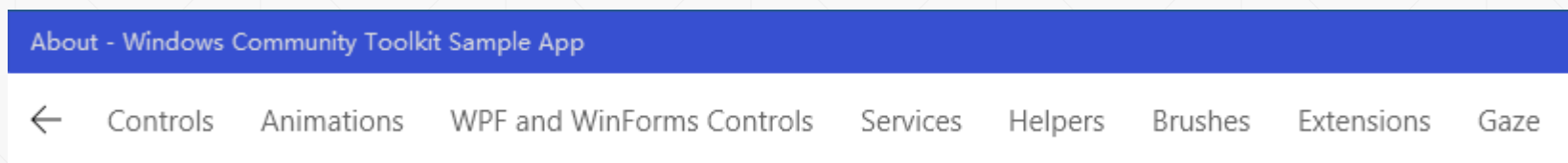
获取

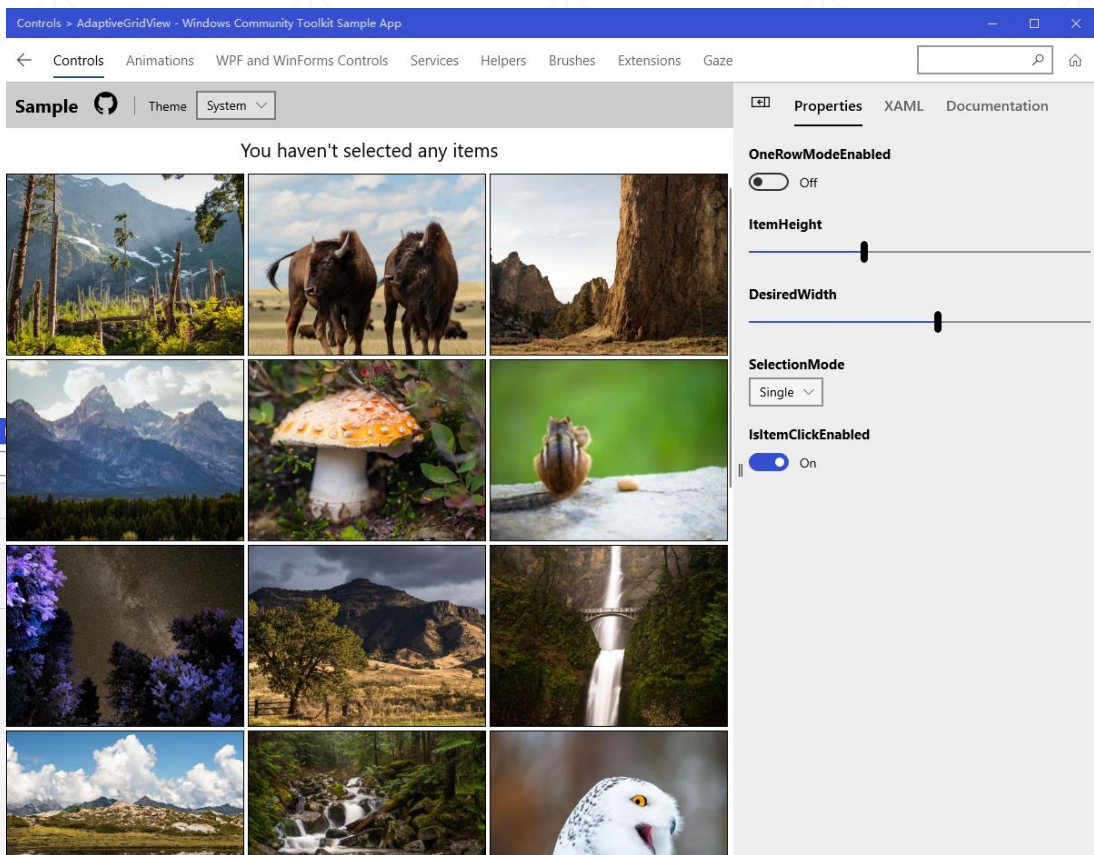
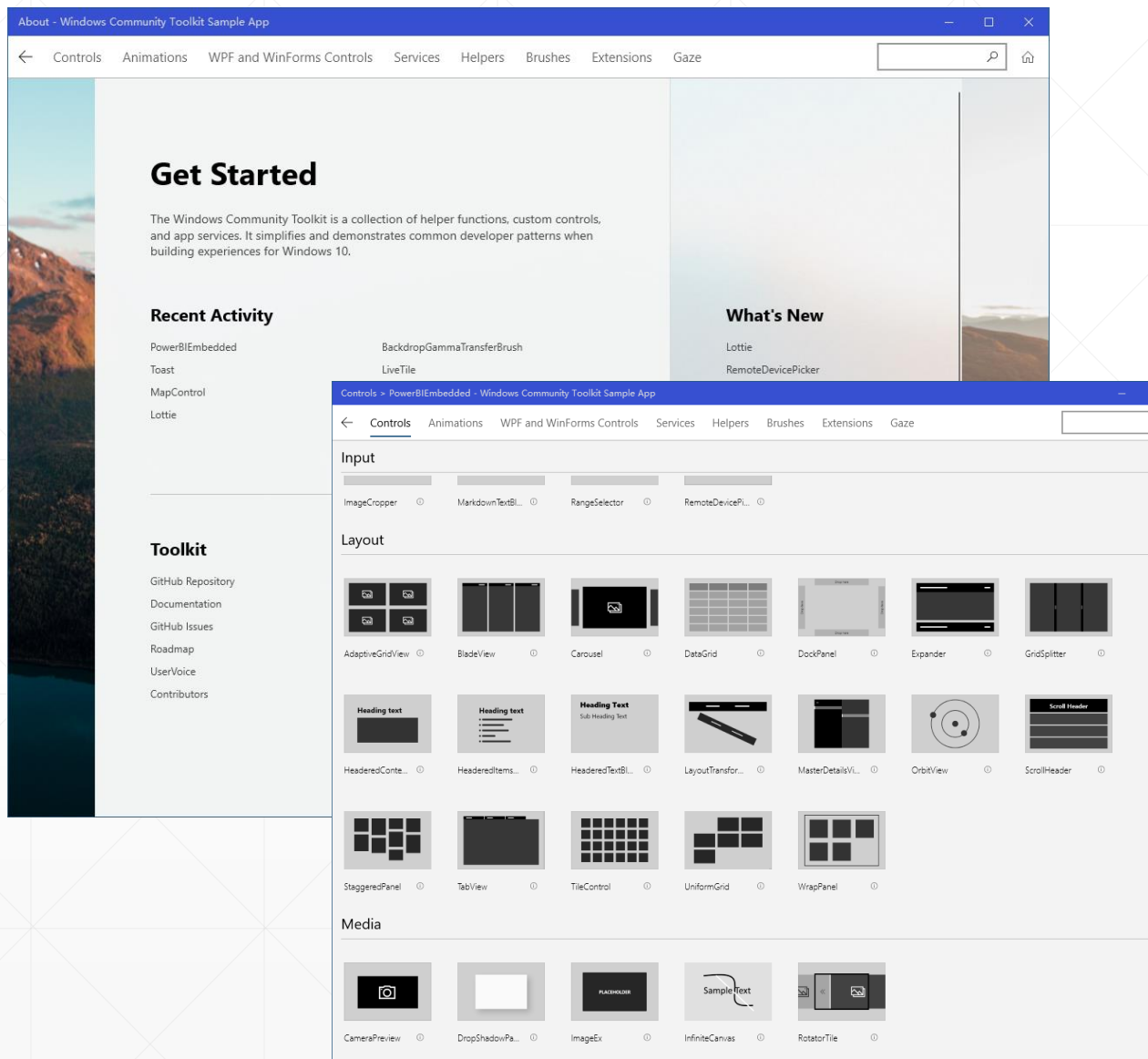
...

△ 请参阅系统要求

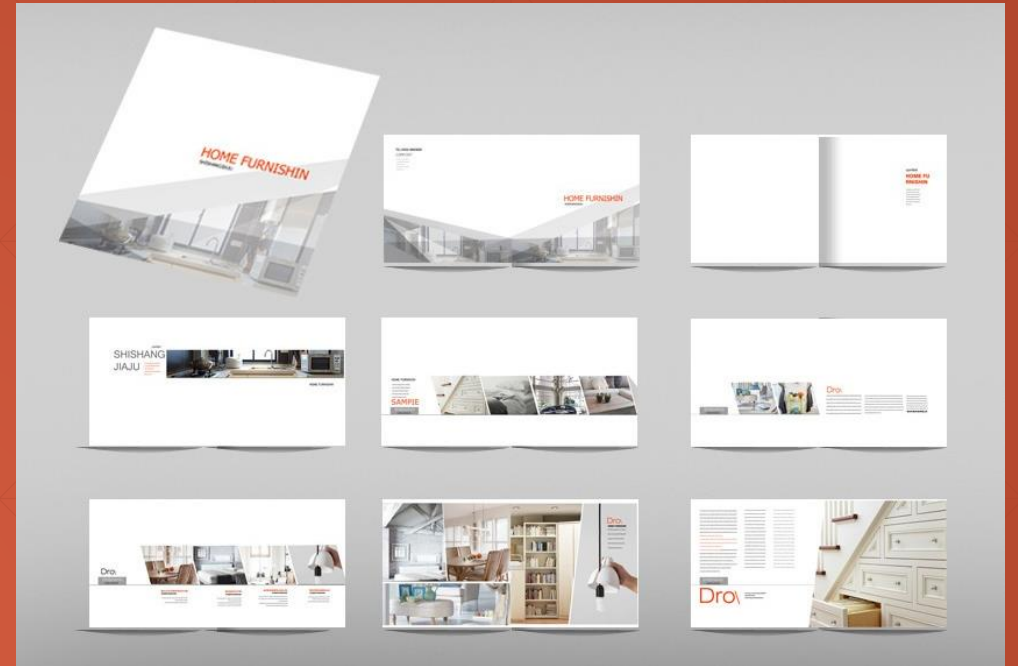
你可以在 Xbox One 主机上购买。(你所在的地区不支持通过 microsoft.com 购买。)

这个App包容以下内容：





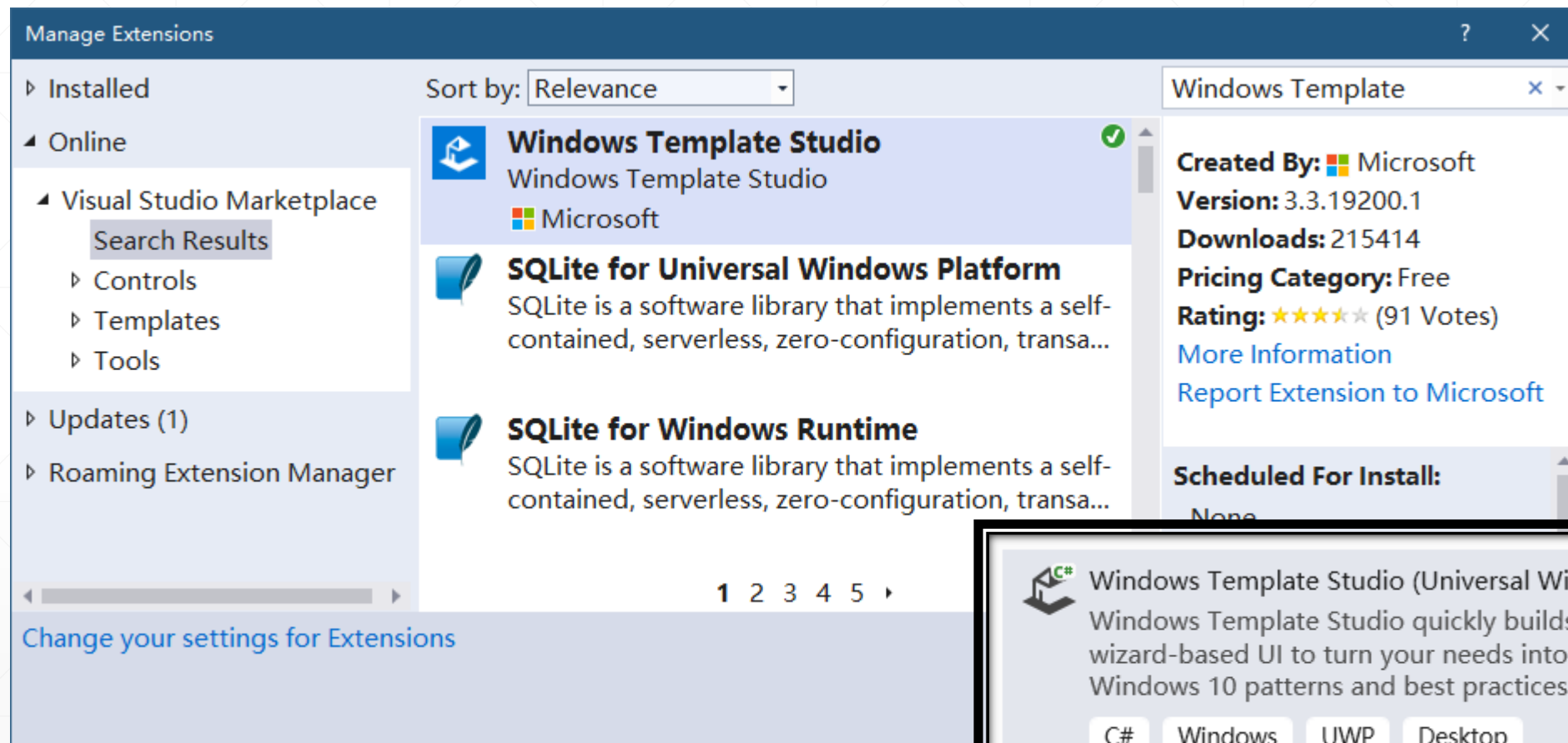
这个App包容有代码和相关文档，并且可看到运行的效果，是学习的好帮手。



Windows Template Studio

一个开源社区构建的非常棒的Visual Studio扩展

安装Windows Template Studio



<https://marketplace.visualstudio.com/items?itemName=WASTeamAccount.WindowsTemplateStudio>

Windows Template Studio提供的项目模板

6个步骤，创建一个UWP项目

New Universal Windows Platform app (WinTemplateStudioApp)

1. Project type ✓

2. Design pattern

3. Pages

4. Features

5. Services

6. Testing

Select a project type

Navigation Pane
A navigation pane (or 'hamburger...'
[Details](#)

Blank
This basic project is a blank canvas upon which to build your app.
[Details](#)

Horizontal Navigation Pane
Navigation Items...
[Details](#)

MenuBar
A menu is added to move around between pages.
[Details](#)

Your project details

Project type
Navigation Pane

Design pattern
Code Behind

Pages
Main

Licenses
[Windows UI Library](#)

About
[Windows Template Studio](#)
[Report issue](#)
Templates version: 3.3.19200.1
Wizard version: 3.3.19200.1

By continuing, you agree to the terms of all the apps that you use. [Back](#) [Next](#) [Create](#) [Cancel](#)

可以创建的UWP项目
主界面类型

New Universal Windows Platform app (WinTemplateStudioApp)

1. Project type ✓

2. Design pattern ✓

3. Pages

4. Features

5. Services

6. Testing

Select a design pattern



Code Behind

This is the traditional model for an application where logic is...
[Details](#)



MVVM Light

MVVM Light is a popular, 3rd party framework based on the Model-...
[Details](#)



MVVM Basic

This is a generic version of a MVVM pattern. The Model-View-...
[Details](#)



Caliburn.Micro

Caliburn.Micro is a popular MVVM framework emphasising...
[Details](#)



Prism

Prism is a framework for building loosely coupled,...
[Details](#)

Your project details

Project type

Navigation Pane

Design pattern

Code Behind

Pages

Main

Licenses

[Windows UI Library](#)

About

[Windows Template Studio](#)

[Report issue](#)

Templates version: 3.3.19200.1

Wizard version: 3.3.19200.1

可以选择使用哪种设计模式来管理和组织代码

By continuing, you agree to the terms of all the licenses in the licenses section.

Back

Next

Create

Cancel

New Universal Windows Platform app (WinTemplateStudioApp)

1. Project type ✓

2. Design pattern ✓

3. Pages ✓

4. Features

5. Services

6. Testing

Add pages



Blank

This is the most basic page. A blank canvas to...

[Details](#)

1



Settings

The settings page is the page where we recommend...

[Details](#)



Web View

The web view page renders web content using...

[Details](#)

1



Media Player

A page for showing video with system...

[Details](#)



Master/Detail

The master-detail page has a master pane and a...

[Details](#)



TreeView

The tree-view page has a tree view control to...

[Details](#)



Content Grid

This page allows



DataGrid

A page displaying



Telerik Data Grid

Your project details

Project type

☐ Navigation Pane

Design pattern

☐ Code Behind

Pages

☐ Main

☐ WebView

☐ InkDraw

☒ ImageGallery

×

Services

☐ Sample

Licenses

[Windows UI Library](#)

有大量的功能已经实现的页面可以插入到项目中

可以随时移除不需要的页面

By continuing, you agree to the terms of all the licenses in the licenses section.

Back

Next

Create

Cancel

New Universal Windows Platform app (WinTemplateStudioApp)

1. Project type ✓

2. Design pattern ✓

3. Pages ✓

4. Features ✓

5. Services

6. Testing

Add features

Application Lifecycle



Settings Storage

Setting storage helps simplify...

[Details](#)



Suspend and Resume

A simple service you can hook...

[Details](#)



Multiple views

Enable your users to view independent...

[Details](#)

Background Work



Background Task

Add an in-process background task...

[Details](#)

Your project details

Project type

Navigation Pane

Design pattern

Code Behind

Pages

Main

WebView

InkDraw

ImageGallery

Services

SampleData

Licenses

针对开发中常用的
技术特性提供可以
参考的代码

By continuing, you agree to the terms of all the licenses in the licenses section.

Back

Next

Create


Cancel

New Universal Windows Platform app (WinTemplateStudioApp)


- 1. Project type ✓
- 2. Design pattern ✓
- 3. Pages ✓
- 4. Features ✓
- 5. Services ✓**
- 6. Testing

Add services


Data



HTTP Data Service
Access content over HTTP.
[Details](#)




Web API
Include ASP.NET Core Web API project.
[Details](#)




SQL Server Data
Get data from SQL Server to use in...
[Details](#)

Identity (choose one)



Forced Login
Make your application require the user to login.
[Details](#)



Optional Login
Make your application have an optional login...
[Details](#)

Your project details

Project type

 Navigation Pane ▼

Design pattern

 Code Behind ▼

Pages

 Main

 WebView



 ery



 SampleData

Licenses

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Back

Next

Create

Cancel

针对UWP可以集成的
Web服务提供参考实现

New Universal Windows Platform app (WinTemplateStudioApp)

1. Project type ✓

2. Design pattern ✓

3. Pages ✓

4. Features ✓

5. Services ✓

6. Testing ✓

Add testing



Test App with
MSTest

Add a project for
unit tests against...

[Details](#)



Test App with
xUnit

Add a project for
unit tests against...

[Details](#)



Test Core
library with
MSTest

Add a project to...

[Details](#)



Test Core
library with
NUnit

Add a project to...

[Details](#)



Test Core
library with
xUnit

Add a project to...

[Details](#)



Win App Driver

Add project for UI
tests using
Appium via...

[Details](#)

Your project details

Project type

Navigation Pane ▼

Design pattern

Code Behind ▼

Pages

Main

WebView

InkDraw

ImageGallery

Services

SampleData

Licenses

By continuing, you agree to the terms of a

可以同步创建单元测试项目

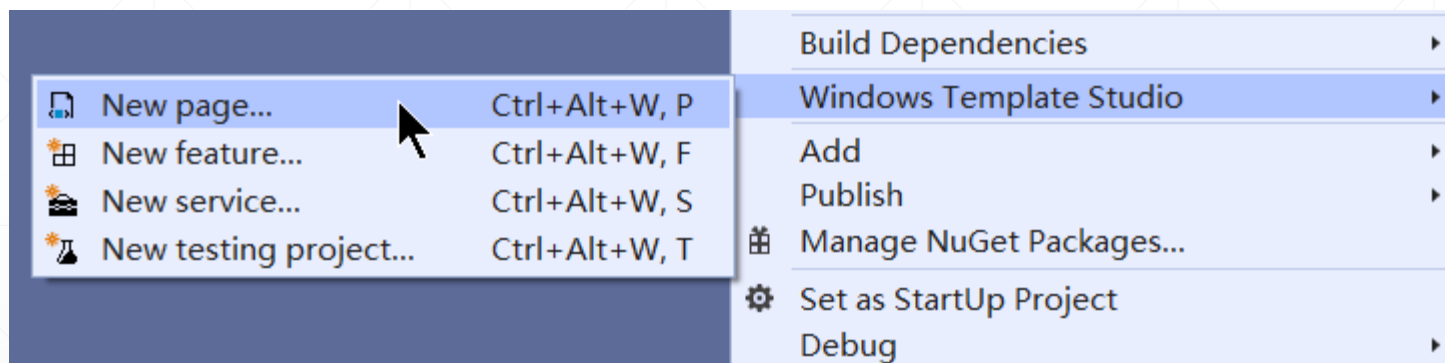
Back

Next

Create

Cancel

项目创建完毕之后，如果需要，可以随时向项目中
添加新项.....



WebView模板

WinTemplateStudioApp

←

☰

☐ Main

☐ WebView

☐ InkDraw

☐ ImageGallery

Microsoft

Windows 开发人员中心

浏览 ▾

平台 ▾

更多 ▾

仪表板

所有 Microsoft ▾

🔍

Docs / Windows / UWP

🔗 ✨ 登录

按标题筛选

> 新增功能

> 立即开始行动

> 设计和 UI

> 开发应用


> 开发游戏

> 发布

API 参考


通用 Windows 平台文档

借助通用 Windows 平台 (UWP)，可以构建适用于任何 Windows 10 设备（电脑、Xbox One、HoloLens 等）的应用，然后将这些应用发布到 Microsoft Store。




新增功能

了解最新版 Windows 10 中的全新 UWP API 和功能。



立即开始行动

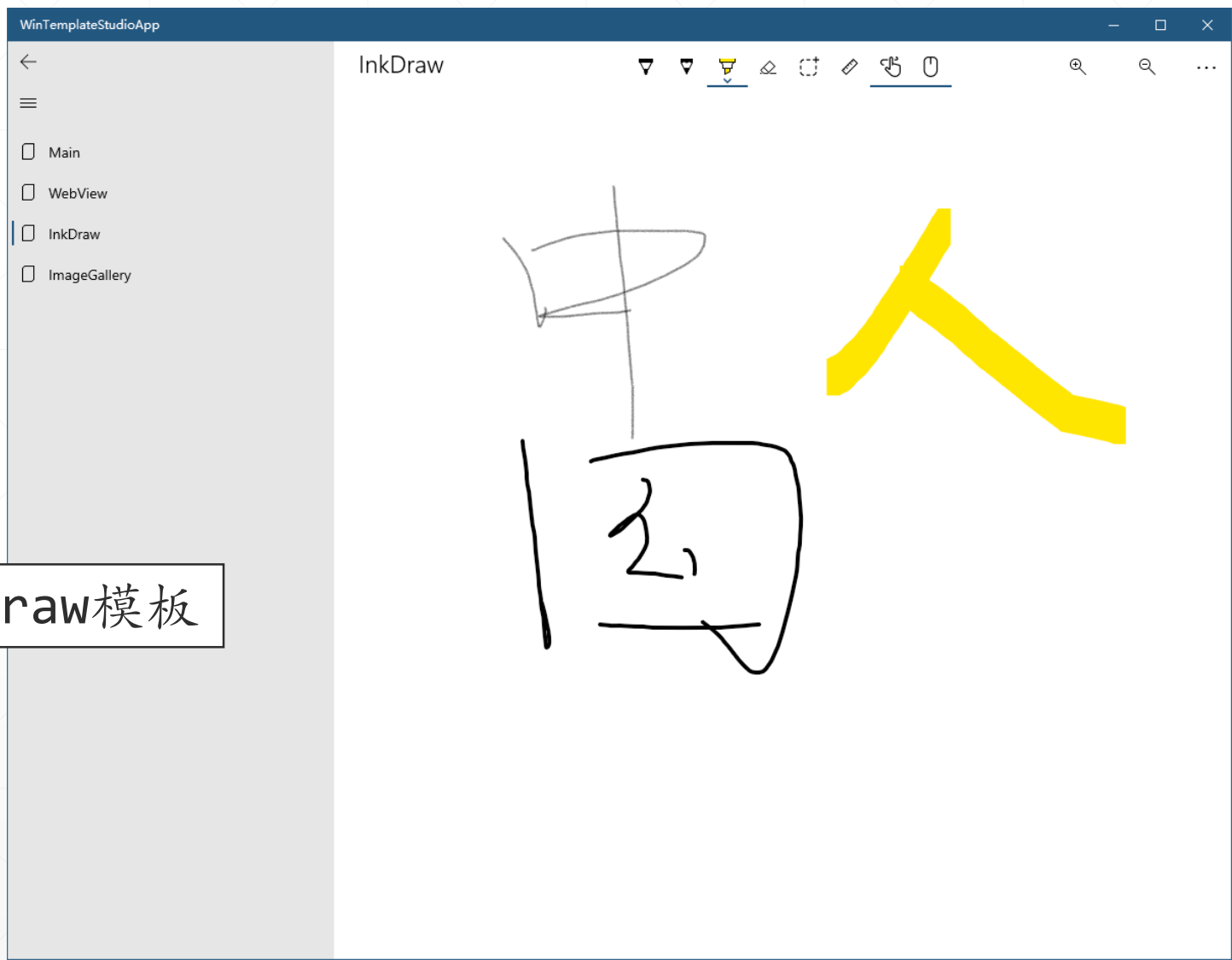
了解核心概念并设置计算机，以便开始构建应用。



设计

了解如何使用 Fluent Design System 设计和编码应用的用户界面。

InkDraw模板



小结



本次PPT介绍了UWP技术领域中与UI控件直接关联的四项内容：

- (1) UWP原生控件的特点
- (2) 官方提供的最新控件库——WinUI
- (3) 社区贡献的控件工具箱——Windows Community Toolkit
- (4) 一个很棒的UWP项目创建模板——Windows Template Studio，它是学习和开发UWP应用的利器



UWP包容相当丰富的内容，你应该在本讲PPT的引导下，主动地去探索，通过阅读官方和社区示例，动手编写一些小的Demo，逐步地掌握UWP的各项技术特性。



基本掌握UWP的各项技术特性之后，余下的工作就是用它来开发各种实用App，在开发实践中慢慢地成长为一名UWP开发高手。