资源系统

张典
An ordinary Avalonia Developer | IRIHI staff

为什么需要资源

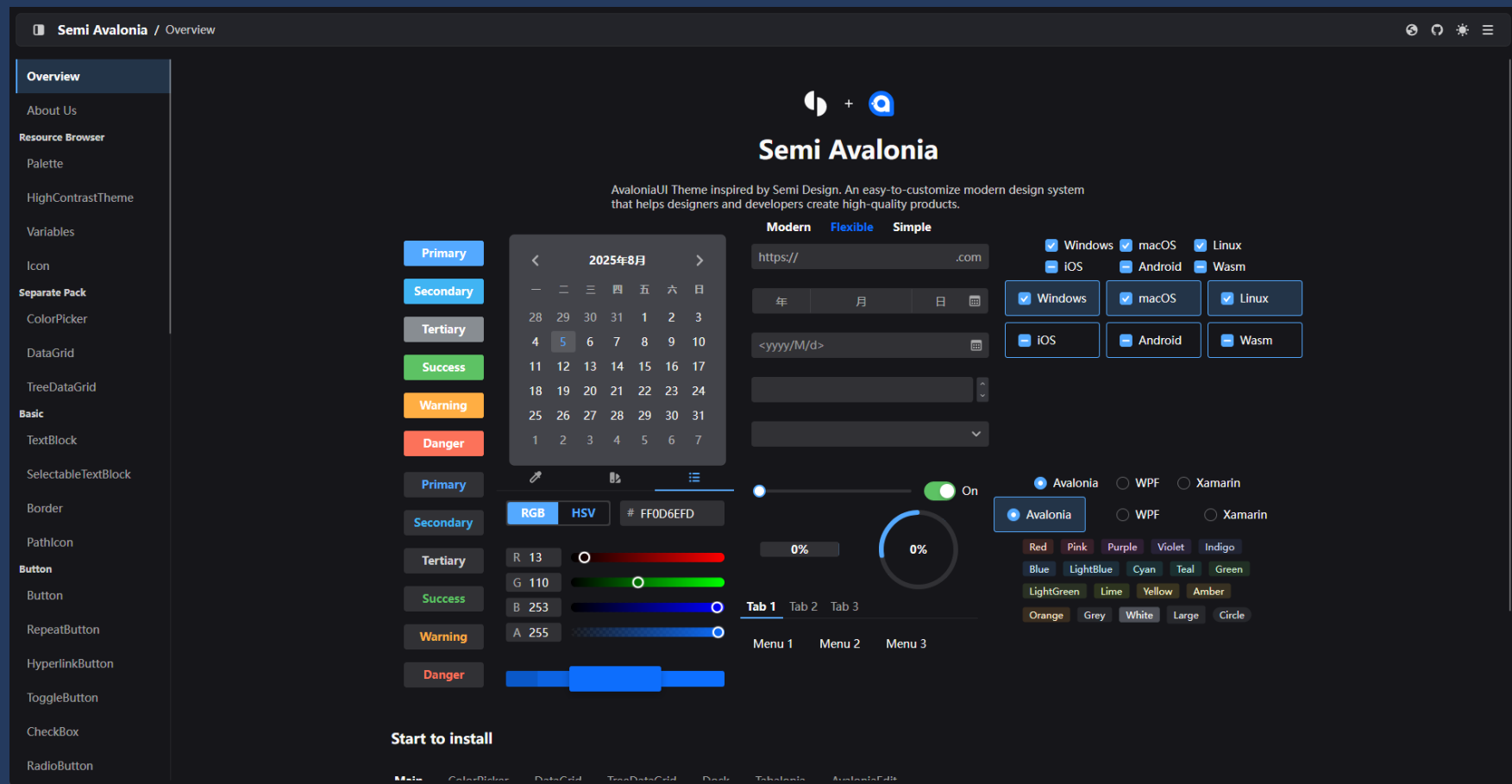# 为什么需要资源

为什么需要资源

```xml
<Color x:Key="SemiWhiteColor">■White</Color>
<Color x:Key="SemiBlackColor">■Black</Color>
<Color x:Key="SemiRed0Color">■#6C090B</Color>
<Color x:Key="SemiRed1Color">■#901110</Color>
<Color x:Key="SemiRed2Color">■#B42019</Color>
<Color x:Key="SemiRed3Color">■#D73324</Color>
<Color x:Key="SemiRed4Color">■#FB4932</Color>
<Color x:Key="SemiRed5Color">■#FC725A</Color>
<Color x:Key="SemiRed6Color">■#FD9983</Color>
<Color x:Key="SemiRed7Color">■#FDBEAC</Color>
<Color x:Key="SemiRed8Color">■#FEE0D5</Color>
<Color x:Key="SemiRed9Color">■#FFF3EF</Color>
```

```xml
<StreamGeometry x:Key="SemiIconBottomCenterStroked">
    M7 2a1 1 0 0 0-1 1v10a1 1 0 0 0 1 1h10a1 1 0 0 0
    1-1V3a1 1 0 0 0-1-1H7Zm1 10V4h8v8H8Zm-5 8a1 1 0 1
    0 0 2h18a1 1 0 1 0 0-2H3Z
</StreamGeometry>
<StreamGeometry x:Key="SemiIconBottomLeftStroked">
    M4 3a1 1 0 0 0-2 0v18a1 1 0 0 0 1 1h18a1 1 0 1 0
    0-2H4V3Zm7-1a1 1 0 0 0-1 1v10a1 1 0 0 0 1 1h10a1 1
    0 0 0 1-1V3a1 1 0 0 0-1-1H11Zm1 10V4h8v8h-8Z
</StreamGeometry>
<StreamGeometry x:Key="SemiIconBottomRightStroked">
    M22 3a1 1 0 1 0-2 0v17H3a1 1 0 1 0 0 2h18a1 1 0 0 0
    1-1V3ZM3 2a1 1 0 0 0-1 1v10a1 1 0 0 0 1 1h10a1 1
    0 0 0 1-1V3a1 1 0 0 0-1-1H3Zm1 10V4h8v8H4Z
</StreamGeometry>
```

```xml
<x:Double x:Key="SemiHeightControlSmall">24</x:Double> <!— 表单项高度 - 小尺寸 —>
<x:Double x:Key="SemiHeightControlDefault">32</x:Double> <!— 表单项高度 - 默认尺寸 —>
<x:Double x:Key="SemiHeightControlLarge">40</x:Double> <!— 表单项高度 - 大尺寸 —>
<x:Double x:Key="SemiWidthIconExtraSmall">8</x:Double> <!— 图标尺寸 - 超小 —>
<x:Double x:Key="SemiWidthIconSmall">12</x:Double> <!— 图标尺寸 - 小 —>
<x:Double x:Key="SemiWidthIconMedium">16</x:Double> <!— 图标尺寸 - 中 —>
<x:Double x:Key="SemiWidthIconLarge">20</x:Double> <!— 图标尺寸 - 大 —>
<x:Double x:Key="SemiWidthIconExtraLarge">24</x:Double> <!— 图标尺寸 - 超大 —>
```

资源是什么

常见的资源

- Brush：笔刷，用于填充图形的颜色或纹理，如SolidColorBrush和LinearGradientBrush

- Geometry：图形数据，描述形状的轮廓，常常用在PathIcon这种图标控件中

- x:String：字符串

- 值类型：

  x:Int32、x:Double等基本数据类型

  Thickness、CornerRadius、Color等结构体

  FontWeight、HorizontalAlignment等枚举类型

资源的用途

- 控件样式和主题统一（如颜色、字体、间距等）
- 复用复杂对象（如笔刷、几何图形、模板等）
- 动态切换主题或风格
- 提高维护性和可读性，减少重复代码

区分Resource和Asset

颜色

圆角

字体文件

图片文件

间距

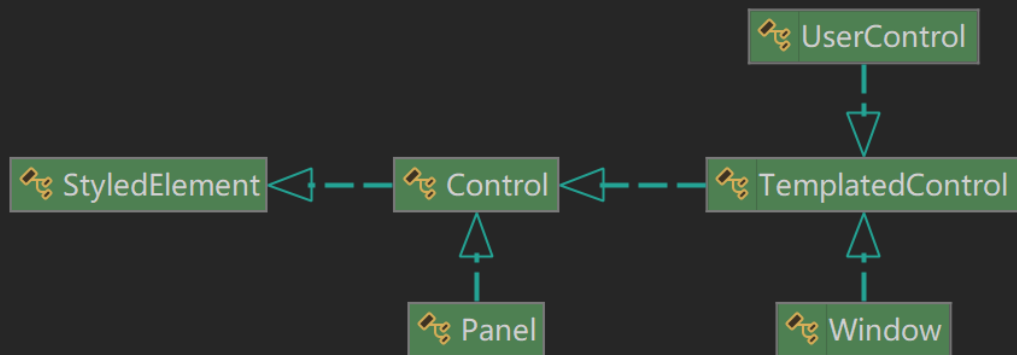字号

音频文件

视频文件

声明资源

声明资源
——核心ResouceDictionary

声明资源

声明资源

```csharp
public class StyledElement : Animatable,
  15 用法    Jeremy Koritzinsky +1    更多...
    public IResourceDictionary Resources
    {
        get => _resources ??= new ResourceDictionary(owner: this);
        ◇
        set
        {
            value = value ?? throw new ArgumentNullException(nameof(value));
            _resources?.RemoveOwner(this);
            _resources = value;
            _resources.AddOwner(this);
        }
    }
}
```

声明资源

- StyledElement: StyledElement的Resources属性
- StyleBase: StyleBase的Resources属性
- Application: Application的Resources属性
- Styles文件的Resources属性
- ResourceDictionary文件

声明资源


```xml
<UserControl.Resources>
    <x:Double x:Key="btnfs">50</x:Double>
    <FontWeight x:Key="btnfw">Bold</FontWeight>
    <SolidColorBrush x:Key="btnfg" Color="■Blue" />
    <SolidColorBrush x:Key="btnbg" Color="■Red" />
</UserControl.Resources>
```

StyledElement的Resources属性

```xml
<UserControl.Styles>
    <Style>
        <Style.Resources>
            <x:Double x:Key="btnfs">50</x:Double>
            <FontWeight x:Key="btnfw">Bold</FontWeight>
            <SolidColorBrush x:Key="btnfg" Color="■Blue" />
            <SolidColorBrush x:Key="btnbg" Color="■Red" />
        </Style.Resources>
    </Style>
</UserControl.Styles>
```

StyleBase的Resources属性

声明资源

```xml
<Application.Resources>
    <x:Double x:Key="btnfs">50</x:Double>
    <FontWeight x:Key="btnfw">Bold</FontWeight>
    <SolidColorBrush x:Key="btnfg" Color="■Blue" />
    <SolidColorBrush x:Key="btnbg" Color="■Red" />
</Application.Resources>
```

Application的Resources属性

```xml
<Styles
    xmlns="https://github.com/avaloniaui"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml">
    <Styles.Resources>
        <x:Double x:Key="btnfs">50</x:Double>
        <FontWeight x:Key="btnfw">Bold</FontWeight>
        <SolidColorBrush x:Key="btnfg" Color="■Blue" />
        <SolidColorBrush x:Key="btnbg" Color="■Red" />
    </Styles.Resources>
</Styles>
```

Styles文件的Resources属性

```xml
<ResourceDictionary
    xmlns="https://github.com/avaloniaui"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml">
    <x:Double x:Key="btnfs">50</x:Double>
    <FontWeight x:Key="btnfw">Bold</FontWeight>
    <SolidColorBrush x:Key="btnfg" Color="■Blue" />
    <SolidColorBrush x:Key="btnbg" Color="■Red" />
</ResourceDictionary>
```
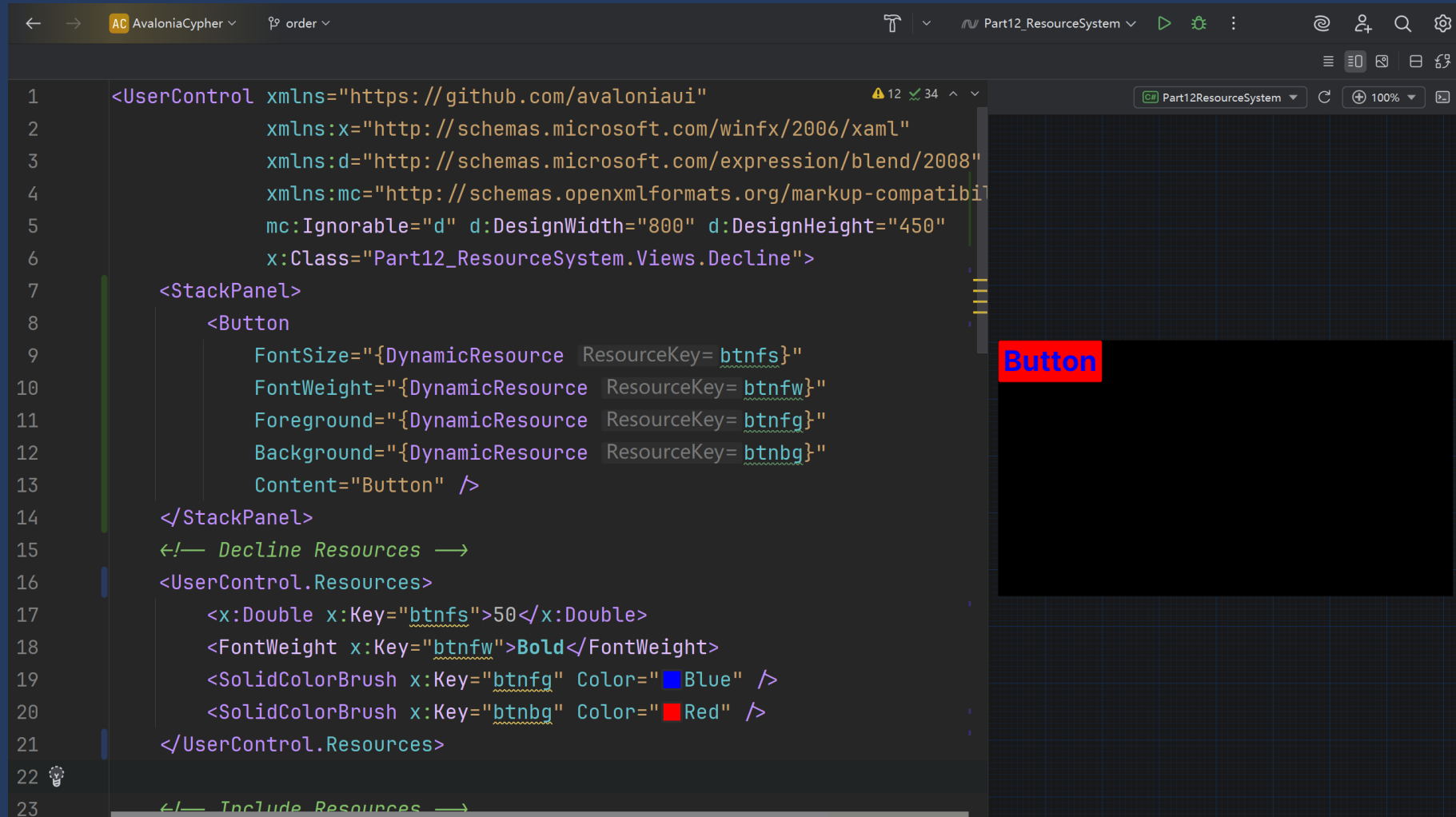
ResourceDictionary文件

使用资源

StaticResource


```xml
<UserControl xmlns="https://github.com/avaloniaui"
             xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
             xmlns:d="http://schemas.microsoft.com/expression/blend/200
             xmlns:mc="http://schemas.openxmlformats.org/markup-compati
             mc:Ignorable="d" d:DesignWidth="800" d:DesignHeight="450"
             x:Class="Part12_ResourceSystem.Views.Decline">
    <StackPanel>
        <Button
            FontSize="{StaticResource ResourceKey= btnfs}"
            FontWeight="{StaticResource ResourceKey= btnfw}"
            Foreground="{StaticResource ResourceKey= btnfg}"
            Background="{StaticResource ResourceKey= btnbg}"
            Content="Button" />
    </StackPanel>
    <!-- Decline Resources -->
    <UserControl.Resources>
        <x:Double x:Key="btnfs">50</x:Double>
        <FontWeight x:Key="btnfw">Bold</FontWeight>
        <SolidColorBrush x:Key="btnfg" Color="Blue" />
        <SolidColorBrush x:Key="btnbg" Color="Red" />
    </UserControl.Resources>

    <!-- Include Resources -->
```

StaticResource

DynamicResource

```xml
<UserControl xmlns="https://github.com/avaloniaui"
             xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
             xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
             xmlns:mc="http://schemas.openxmlformats.org/markup-compatibil
             mc:Ignorable="d" d:DesignWidth="800" d:DesignHeight="450"
             x:Class="Part12_ResourceSystem.Views.Decline">
    <StackPanel>
        <Button
            FontSize="{DynamicResource ResourceKey= btnfs}"
            FontWeight="{DynamicResource ResourceKey= btnfw}"
            Foreground="{DynamicResource ResourceKey= btnfg}"
            Background="{DynamicResource ResourceKey= btnbg}"
            Content="Button" />
    </StackPanel>
    <!-- Decline Resources -->
    <UserControl.Resources>
        <x:Double x:Key="btnfs">50</x:Double>
        <FontWeight x:Key="btnfw">Bold</FontWeight>
        <SolidColorBrush x:Key="btnfg" Color="Blue" />
        <SolidColorBrush x:Key="btnbg" Color="Red" />
    </UserControl.Resources>
    <!-- Include Resources -->
```

区别与选择

- StaticResource：程序编译的时候就直接解析资源，查找资源时只执行一次，适合大多数静态样式场景。

- DynamicResource：程序运行的时候动态查找资源，查找资源时会监听资源变化，资源更新时自动刷新绑定，适合需要动态切换主题或资源的场景。

资源的查找顺序

资源的查找顺序

Application
|- Resources [7]
|- Styles
    |- Resources [8]

UserControl
|- Resources [5]
|- Styles
    |- Resources [6]
|- StackPanel
    |- Resources [3]
    |- Styles
       |- Resources [4]
    |- Button
       |- Resources [1]
       |- Styles
          |- Resources [2]

资源的查找顺序

- StaticResource：程序编译的时候就直接解析资源
- DynamicResource：程序运行的时候动态查找资源

- StaticResource的实际流程：
1. XAML 加载器构造 Button
2. 遇到 Content="{StaticResource btnc}"，立即尝试解析资源
3. 此时 Button.Resources 还没被加载进去
4. 因此向上查找，命中 StackPanel.Resources["btnc"]，即 "StackPanelResource"

资源的查找顺序

UserControl
|- Resources [13]
    |- Merged dictionary [15]
    |- Merged dictionary [14]
|- Styles
    |- Resources [16]
        |- Merged dictionary [18]
        |- Merged dictionary [17]
|- StackPanel
    |- Resources [7]
        |- Merged dictionary [9]
        |- Merged dictionary [8]
    |- Styles
        |- Resources [10]
            |- Merged dictionary [12]
            |- Merged dictionary [11]
    |- Button
        |- Resources [1]
            |- Merged dictionary [3]
            |- Merged dictionary [2]
        |- Styles
            |- Resources [4]
                |- Merged dictionary [6]
                |- Merged dictionary [5]

Application
|- Resources [13]
    |- Merged dictionary [15]
    |- Merged dictionary [14]
|- Styles
    |- Resources [16]
        |- Merged dictionary [18]
        |- Merged dictionary [17]

Merged dictionary可以是
• ResourceDictionary
• ResourceInclude
• MergedResourceInclude

资源的查找顺序

Application [8]
|- (Resources/Styles)

StyledElement
|- Resources [1]
    |- ThemeDictionaries
        |- Merged dictionary(Default) [3]
        |- Merged dictionary(Light/Dark) [2]
    |- MergedDictionaries
        |- Merged dictionary [5]
        |- Merged dictionary [4]
|- Styles
    |- Style
        |- Resources [7]
            |-(ThemeDictionaries/MergedDictionaries)
    |- Style
        |- Resources [6]
            |-(ThemeDictionaries/MergedDictionaries)

小结