

# NUI CONCEPTS FOR WPF

---

Philip Japikse (@skimedic)

skimedic@outlook.com

[www.skimedic.com/blog](http://www.skimedic.com/blog)

Microsoft MVP, ASPInsider, MCSD, MCDBA, CSM, CSP



## PHIL.ABOUT()

- Developer, Author, Teacher
- Microsoft MVP, ASPInsider, MCSD, MCDBA, CSM, CSP
- Founder, Agile Conferences, Inc.
- President, Cincinnati .NET User's Group
- Co-host, Hallway Conversations
  - [www.hallwayconversations.com](http://www.hallwayconversations.com)

# NATURAL USER INTERFACES

- Designed to help a user quickly transform from novice to expert
  - User is rewarded with an instant feeling of success by using
    - Natural Movements
    - Fluidity
    - Visual Feedback
  - Mechanisms for creating NUI include
    - Behaviors
    - Animations
    - Transformations
    - Continuous feedback and response
  - Bottom line: Interactions must come naturally
-

BEHAVIORS

---

# BEHAVIORS

- Introduced in Expression Blend v3
- Encapsulate functionality into reusable components
  - Drag & Drop
  - Pan and Zoom
  - Input Validation
  - Watermark Text
  - InvokeCommand
- Additional Behaviors are available from the Expression Gallery
  - <http://msdn.microsoft.com/en-us/expression/jj873995>

# DEMO

Behaviors

# TRANSFORMATIONS

---

# TRANSFORMS

- Change the way a shape or elements is drawn
  - Rotation, Scale, Translation, Skew, Matrix, Group
- Changes are applied all at once
  - All use Matrix math to do the transform
- Transforms can be animated

```
var trans = new ScaleTransform(2, 2);  
MyRectangle.RenderTransform = trans;  
MyEllipse.RenderTransform = trans;  
MyEllipse2.RenderTransform = trans;
```



ANIMATIONS



# ANIMATIONS

- True animation is a core part of XAML/WPF
    - No need to use timers or other tricks
  - Integrate seamlessly into XAML objects
    - UIElements still behave like UI elements
  - Any dependency property can be animated
    - Can't add or remove objects through animations
  - Animation classes are based on the type of the property that they animate
  - Easing functions can add additional “life like” movements
-

# TYPES OF ANIMATIONS

- Linear Interpolation
    - Move from one value to another in a straight line at a steady rate
    - Not all data types support linear interpolation (e.g. strings)
  - Keyframe animations
    - Move from one value to another through a series of intermediate values
    - Supported by all types
  - Path based animations
    - Modifies values based on a path-geometry
    - Primarily used for moving a shape along a path
-

## BUILDING ANIMATIONS IN CODE

- Select the animation type
- Add the value to animate To
  - From is optional
- Select a duration (Time Span)
  - Default is instant (0 seconds)
- Call `UIElement.BeginAnimation()`
  - Set property to be animated
    - Base dependency property name

```
var animationRW = new DoubleAnimation(  
    MyRectangle.Width,  
    MyRectangle.Width * 2,  
    TimeSpan.FromSeconds(2));  
var animationRH = new DoubleAnimation(  
    MyRectangle.Height,  
    MyRectangle.Height * 2,  
    TimeSpan.FromSeconds(2));  
MyRectangle.BeginAnimation(  
    Rectangle.WidthProperty,  
    animationRW);  
MyRectangle.BeginAnimation(  
    Rectangle.HeightProperty,  
    animationRH);
```

# BUILDING ANIMATIONS IN XAML

- Done using a storyboard object
  - Only way to have animations be parallel
- Set Target or TargetName
- Set TargetProperty
  - Base dependency property name
- Set From and To values
- Set Duration (“hh:mm:ss”)
  - Default is instant (0 seconds)

```
<Storyboard>
  <DoubleAnimationUsingKeyFrames
    Storyboard.TargetProperty="(Border.Opacity)"
    Storyboard.TargetName="ErrorBorder">
    <EasingDoubleKeyFrame
      KeyTime="0"
      Value="0" />
    <EasingDoubleKeyFrame
      KeyTime="0:0:1"
      Value="1" />
  </DoubleAnimationUsingKeyFrames>
  <DoubleAnimationUsingKeyFrames
    Storyboard.TargetProperty="(UIElement.Opacity)"
    Storyboard.TargetName="ErrorAsterisk">
    <EasingDoubleKeyFrame
      KeyTime="0"
      Value="0" />
    <EasingDoubleKeyFrame
      KeyTime="0:0:1"
      Value="1" />
  </DoubleAnimationUsingKeyFrames>
</Storyboard>
```

# BEHAVIORS

- Introduced in Expression Blend v3
- Encapsulate functionality into reusable components
  - Drag & Drop
  - Pan and Zoom
  - Input Validation
  - Watermark Text
  - InvokeCommand
- Additional Behaviors are available from the Expression Gallery
  - <http://msdn.microsoft.com/en-us/expression/jj873995>

# DEMO

Animations

Questions?





## Contact Me

[skimedic@gmail.com](mailto:skimedic@gmail.com)

[www.skimedic.com/blog](http://www.skimedic.com/blog)

[www.twitter.com/skimedic](http://www.twitter.com/skimedic)

[www.hallwayconversations.com](http://www.hallwayconversations.com)

[www.about.me/skimedic](http://www.about.me/skimedic)

Thank  
You!