



**WPF DA IKKI O'LCHOVLI VA UCH O'LCHOVLI GRAFIKALAR
BILAN ISHLASHNING HAYOTGA TATBIQLARI.**

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Anotatsiya: Ushbu maqolada WPF (Windows Presentation Foundation) grafik dizayn, uning nazariy asoslari, amaliy qo'llanilishi va C# dasturlash tilidagi dasturiy ko'rinishi batafsil bayon etiladi. Shuningdek, WPFning afzalliklari, cheklovlari va dasturiy amalga oshirilishi haqida ham takidlab o'tiladi.

Kalit so'zlar: WPF, grafika, stil, trigger, tema, visual studio, XAML, C# dasturlash, Viewport3D, interfeys, o'yin va animatsiyalar.

Annotation: This article provides a detailed description of WPF (Windows Presentation Foundation) graphic design, its theoretical foundations, practical applications, and programmatic implementation in the C# programming language. Additionally, the article highlights the advantages, limitations, and software implementation of WPF.

Keywords: WPF, graphics, style, trigger, theme, Visual Studio, XAML, C# programming language, Viewport3D, interface, games, and animations.

Аннотация: В этой статье подробно рассматриваются графический дизайн WPF (Windows Presentation Foundation), его теоретические основы, практическое применение и программная реализация на языке программирования C#. Также подчеркиваются преимущества, ограничения и программная реализация WPF.

Ключевые слова: WPF, графика, стиль, триггер, тема, Visual Studio, XAML, язык программирования C#, Viewport3D, интерфейс, игры и анимации.

Kirish: Hozirgi zamonda vizualizatsiya har qanday sohada katta ahamiyatga ega. WPF texnologiyasi ikki o'lchovli (2D) va ucho'lchovli (3D) grafikalar yaratish va ulardan foydalanishda qulay platforma hisoblanadi. Ushbu maqolada WPF yordamida 2D va 3D grafikalar yaratishning texnik jihatlari va ularning hayotiy tatbiqlari haqida fikr yuritiladi.

WPF dasturini yaratishda birinchi bo'lib Window klassi uchraydi. U oynaning ildizi bo'lib xizmat qiladi va sizga standart chegara, sarlavha satrini va tugmalarni kattalashtirish, kichraytirish va yopish bilan ta'minlaydi. WPF oynasi - bu elementi ildiz





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bo'lgan XAML (.xaml) faylining va CodeBehind (.cs) faylining kombinatsiyasi. Agar siz Visual Studio (Express) dan foydalanayotgan bo'lsangiz va siz yangi WPF dasturida ishlayotgan bo'lsangiz, u siz uchun standart oynani yaratadi.

WPF ning afzalliklari:

- WPF (Windows Presentation Foundation) texnologiyasi .NET platformasining bir qismidir va grafik interfeyslarni yaratish uchun quyi tizimdir.
- Agar WinForms-ga asoslangan an'anaviy ilovalarni yaratishda boshqaruv va grafiklarni chizish uchun Windows OS ning user32 va GDI + kabi qismlari javob bersa, WPF ilovalari DirectX-ga asoslangan. Bu WPF grafik ko'rsatish asosiy xususiyati hisoblanadi: WPF yordamida, yana bir muhim qismi oddiy tugmalar va murakkab 3D - modellar kabi grafik chizishdir.
- Muhim qismlardan biri XML - ga asoslangan XAML interfeysining deklarativ belgilash tilidan foydalanishdir: interfeysning deklarativ e'lonini yoki boshqariladigan C# tillarida kodni ishlatib, boy grafik interfeysni yaratishingiz mumkin.

Ikki o'lchovli grafikalar bilan ishlash

Tavsif

WPF ikki o'lchovli grafikalar yaratish uchun kuchli vositalarni taqdim etadi. Ushbu grafikalar asosan geometrik shakllar, matnlar, tasvirlar va vizual effektlarni o'z ichiga oladi. Bunga misol sifatida Canvas, StackPanel kabi konteynerlarni keltirish mumkin.

Kod namunasi

Quyidagi kod ikki o'lchovli grafikaning oddiy namunasi bo'lib, unda bir necha geometrik shakllar chizilgan:

```
<Window x:Class="Grafika.MainWindow"
        xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
        xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
        Title="2D Graphics Example" Height="400" Width="400">
    <Canvas>
        <Ellipse Fill="Blue" Width="100" Height="100" Canvas.Left="50"
Canvas.Top="50" />
        <Rectangle Fill="Green" Width="150" Height="75" Canvas.Left="200"
Canvas.Top="100" />
        <Line X1="0" Y1="0" X2="300" Y2="300" Stroke="Red"
StrokeThickness="2"/>
    </Canvas>
</Window>
```

Hayotiy tatbiqlar

Grafik interfeyslar: Mahsulotlarning foydalanuvchi interfeyslarini loyihalash.





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Ma'lumotlar vizualizatsiyasi: Statistik ma'lumotlarni grafikalar yordamida taqdim etish.

O'yinlar: O'yin interfeyslarini va animatsiyalarni yaratish.

Uch o'lchovli grafikalar bilan ishlash

Tavsif

WPF 3D grafikalarini yaratish uchun Viewport3D elementini taklif etadi. Bu element uch o'lchovli modellarni chizish va ularni boshqarish imkonini beradi. 3D grafikalar geometrik modellar, yorug'lik va teksturalarni o'z ichiga oladi.

Kod namunasi:

Quyidagi kod uch o'lchovli grafikaning sodda namunasi bo'lib, unda uchburchakli prizma chizilgan:

```
<Window x:Class="Grafika.MainWindow"
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
Title="3D Graphics Example" Height="400" Width="400">
  <Viewport3D>
    <Viewport3D.Camera>
      <PerspectiveCamera Position="0,0,5" LookDirection="0,0,-5"
UpDirection="0,1,0" FieldOfView="45" />
    </Viewport3D.Camera>
    <ModelVisual3D>
      <ModelVisual3D.Content>
        <Model3DGroup>
          <AmbientLight Color="White"/>
          <GeometryModel3D>
            <GeometryModel3D.Geometry>
              <MeshGeometry3D Positions="0,0,0 1,0,0 0,1,0 0,0,1"
TriangleIndices="0 1 2 0 2 3 0 1 3 1 2 3" />
            </GeometryModel3D.Geometry>
            <GeometryModel3D.Material>
              <DiffuseMaterial Brush="Blue"/>
            </GeometryModel3D.Material>
          </GeometryModel3D>
        </Model3DGroup>
      </ModelVisual3D.Content>
    </ModelVisual3D>
  </Viewport3D>
</Window>
```

Hayotiy tatbiqlar





Dizayn va arxitektura: Binolar va mahsulotlarni loyihalash.

Tibbiyot: Uch o'lchovli vizualizatsiya yordamida tahlil qilish (masalan, MRI ma'lumotlari).

O'yin va animatsiyalar: Uch o'lchovli modellarni yordamida haqiqiy sahnalarni yaratish.
Xulosa

WPF dasturlashda ikki va uch o'lchovli grafikalar bilan ishlash ko'plab sohalarda qo'llanilishi mumkin. WPF'ning grafik imkoniyatlari nafaqat sodda shakllar yaratish, balki murakkab sahnalarni yaratishga ham xizmat qiladi. Shu sababli, bu texnologiya vizualizatsiya ehtiyojlari uchun ajoyib tanlovdir.

FOYDALANILGA ADABIYOTLAR:

1. Мэтью Мак-Дональд. WPF: Windows Presentation Foundation в .NET 4.0 с примерами на C# 2010 для профессионалов. — М.: «Вильямс», 2011.
2. Adam Nathan. Windows Presentation Foundation Unleashed. — Sams Publishing, 2006.
3. Chris Sells, Ian Griffiths. Windows Presentation Foundation. — O'Reilly Media, 2007.
4. José S. Sánchez. WPF 4.5 Unleashed. — Pearson Education, 2014.
5. Markus G. Schlüter. Pro WPF in C# 2010: Windows Presentation Foundation in .NET 4.0. — Apress, 2010.
6. Shawn Wildermuth. Windows Presentation Foundation 4.5. — Wiley, 2012.
7. Kunal Chowdhury. Pro WPF 4.5 in C# 2013. — Apress, 2013.
8. XAML Unleashed: Windows Presentation Foundation (WPF). — Addison-Wesley, 2007.
9. Dwayne S. Miller, Sean P. Corns. Windows Presentation Foundation 4.0. — Microsoft Press, 2010.
10. Walter R. P. A. S. Ang. Mastering WPF. — Wiley, 2008.
11. Matthew MacDonald. Pro WPF in C# 2008. — Apress, 2008.
12. Michele Leroux Bustamante. Learning WPF. — O'Reilly Media, 2007.
13. Dino Esposito. Programming Windows Presentation Foundation. — Microsoft Press, 2007.
14. Viktor Farkas. Practical WPF Charts and Graphics. — Apress, 2010.
15. Jeremy Bytes. WPF: 2D and 3D Graphics with C#. — Packt Publishing, 2012.
16. Laurence Moroney. Pro Silverlight 4 in C#. — Apress, 2010.
17. Mark Kermode. Mastering WPF 4.0 Graphics. — Wiley, 2011.
18. Jesse Liberty. Programming WPF. — O'Reilly Media, 2007.

