The Engaging User Experience & the Natural User Interface

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//interknowlogy/
A little bit about me and why I am here...
InterKnowlogy (IK) is an end-to-end service delivery shop focused on bringing tech to the enterprise that is intuitive and easy to use. IK services include ideation to transform business challenges and vague concepts into amazing solutions, interaction design to create beautiful user experiences, to complex app development and deployment with support services. We build our natural user interface (NUI) solutions on XAML, WPF, WinRT, HTML5 and/or Windows Phone.

**Natural User Interface (NUI).** IK has been focused in NUI for the past 7 years. We ideate, design, build, and deploy NUI apps on all shapes of hardware, including phone, tablet, wall, and/or table. IK knows how to build apps where touch and gesture are the primary ways users interact with the experience.

**App Renovation.** IK transforms existing apps with NUI technology. We can re-factor any app into a NUI experience. But our app renovation isn’t skin deep – we go beyond transforming your app for touch and bringing the well-travelled app pathways to the forefront. IK rebuilds the app with a solid app architecture foundation so that new features can be easily added, and the app can be more thoroughly tested in less time.

**Enterprise Mobile Apps (EMA).** IK has two focus areas in EMA – expanding your brand and service through massive consumer consumption, and increasing the productivity of your employees through mobile enablement of your enterprise software.

**User Interaction Design.** IK’s expertise in User Interaction design, (IxD), as implemented in the Natural User Interface (NUI), is heavily focused on satisfying the needs and desires of the majority of people who will use our software products. Our main focus is on natural behaviors (touch, gesture and voice recognition) when using the software we build. Other disciplines, like software engineering, have a heavy focus on designing for technical stakeholders of a project. We believe in designing software for the actual users.

**Big DATA + Rich Data Visualization.** IK visualizes data in context to the user, breaking the barriers of standard maps and charts for information viewing. By intelligently displaying data, rather than using broad and generic strokes, we enable users to glean insights not before possible.
Who we work for

Microsoft
Mandarin Oriental
Callaway
P&G
Library of Congress
Coca-Cola
Cardinal Health
Medtronic
Accenture
FedEx
Levi’s
Colonial Life
Boeing
Merck
NASA
Converse
MasterCard
ABC
NBC
Interactive Kiosk & Active Digital Signage Software

The Content Defines the Experience
• Agnostic to Industry and Vertical Market
• Large Tiles / Shallow Navigation / Flexible Content

The Natural User Interface (NUI): Touch, Gesture & Voice Controlled

Attract Mode Engages
Powerful CMS / Dynamic Synchronization of Content

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www.Actus-Software.com
<table>
<thead>
<tr>
<th>Objectives And Agenda</th>
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<tbody>
<tr>
<td>User Interaction Design (IxD) – A New Frontier of Design...</td>
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<tr>
<td>Guidance in NUI: Innovation in Touch, Gesture &amp; Voice Driven User Experiences</td>
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<td>NUI Technology Roadmap, Speculations &amp; Predictions</td>
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<tr>
<td>The Tenets of Engaging User Experiences</td>
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<td>Where We have Been and Where We are Going</td>
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<tr>
<td>Demos, Demos, Demos....</td>
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Converse World-Wide Shoe Launch

Tim Huckaby

- Chairman / Founder, InterKnowlogy & Actus Software
## The Natural User Interface (NUI):

### Multi-Touch Capable
- Common Gestures of Touch
- Physical Object Interaction
- Virtual Object Interaction

### Gesture Capable
- Motion Based Interface
- Tracking of full-body movement, facial expression, and voice with precision

### Voice Capable
- Multi-array Microphone
- Uniquely Distinguish Audio & Voices

### Neural Capable
- Conscious and non-conscience interfaces
- Non Invasive
Demo

Tim Huckaby

- Chairman / Founder, InterKnowlogy & Actus Software
```csharp
else if (this.pdbViewer.ActionType == PdbActionType.Translate)
{   
    // Calculate the delta vector for rotation
    Vector3D deltaVector = new Vector3D(deltaX, deltaY, deltaZ);

    QuaternionRotation3D rotation =
        (QuaternionRotation3D)this.rotateTransform.rotation;

    Matrix3D matrix = new Matrix3D();
    matrix.Rotate(rotation.Quaternion);
    matrix.Invert();

    deltaVector = matrix.Transform(deltaVector);

    this.translateTransform.OffsetX += deltaVector.X;
    this.translateTransform.OffsetY += deltaVector.Y;
    this.translateTransform.OffsetZ += deltaVector.Z;

    this.previousMousePoint = currentMousePoint;
}
```

This is why I should have paid attention in high school calculus.

Check out the method level support for Rotation.
The 7 Tenets of an *Engaging UX*

1. Use the Power of Faces
2. Use Food, Sex and Danger
3. Tell a story
4. Build commitment over time
5. Make it Intuitive & Easy to Use
6. “Game-ification”
7. Use Natural Interactions & Behaviors
Cincinnati Children's Hospital
The Power of Faces

Tim Huckaby
- Chairman / Founder, InterKnowlogy & Actus Software

Delivering the Art of Software
## The 6 Tenets of Attraction

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<thead>
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<tbody>
<tr>
<td>1.</td>
<td>Movement</td>
</tr>
<tr>
<td>2.</td>
<td>Use Avatars</td>
</tr>
<tr>
<td>3.</td>
<td>UI affected by Body Movement</td>
</tr>
<tr>
<td>4.</td>
<td>Sound</td>
</tr>
<tr>
<td>5.</td>
<td>Interactive 3D</td>
</tr>
<tr>
<td>6.</td>
<td>Collaboration</td>
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</table>
3D Cameras

Kinect for Windows
- $250
- .NET

Leap Motion
- $70
- https://leapmotion.com
- Multi-Platform

SoftKinetic
- http://www.softkinetic.com
- $249
- Distance and Near Mode; Multiple Products
- In the space for over a decade

Panasonic
- Works outside in direct sunlight
- $2,600
Tim Huckaby

- Chairman / Founder, InterKnowlogy & Actus Software
User Interaction Design:  
• Extends Beyond the Screen  
• Shapes Digital Things for People’s Use  
• Is the practice of designing interactive digital products, environments, systems, and services.  
• Has a Main focus on Human Behavior and Interaction

Distinction:  
• **User Interaction Design**: heavily focused on satisfying the needs and desires of the majority of people who will use the product  
• **Application Programming**: heavily focused on designing for technical stakeholders of the product
User Interaction Design Sketch
“Game-ification” Culture

NUI Experiences that Enhance Learning

Learning made Fun / Entertaining
Proven as a learning tool beyond just Children
Computer based Games are a significant part of popular culture
University Level Educational Video Game Curriculums
- MIT, UC Irvine, Minnesota, Michigan State, etc.
Kinect for Windows: Jumpido

Tim Huckaby
- Founder, InterKnowlogy & Actus Software
- Microsoft RD & MVP

Lessons from the Trenches of NUI: User Experience and Interaction Design
Actus Interactive Digital Content System (Kiosk)

Tim Huckaby
- Chairman / Founder, InterKnowlogy & Actus Software
InterKnowlogy POC-Tetra:
Interactive Digital Signage & Attraction Algorithm

Tim Huckaby
Founder / Chairman,
InterKnowlogy
Founder / CEO,
You may be having fun waving at the Kinect...But, it’s watching you....
The "Cancer App" & The "AutoCAD App"

Tim Huckaby
Founder / Chairman, InterKnowlogy
Founder / CEO, Actus Software

Demographics & Facial Recognition

Video

Tim Huckaby
Founder / Chairman, InterKnowlogy
Founder / CEO,
### LAX Departures

<table>
<thead>
<tr>
<th>City</th>
<th>Airline</th>
<th>Flight</th>
<th>Scheduled</th>
<th>Gate</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington</td>
<td>UNITED</td>
<td>432</td>
<td>08:40 AM</td>
<td></td>
<td>On Time</td>
</tr>
<tr>
<td>Washington</td>
<td>UNITED</td>
<td>856</td>
<td>09:38 AM</td>
<td></td>
<td>Delayed 13 minutes</td>
</tr>
<tr>
<td>Houston</td>
<td>UNITED</td>
<td>306</td>
<td>08:00 AM</td>
<td>73</td>
<td>Departed 11 minutes late</td>
</tr>
<tr>
<td>Houston</td>
<td>UNITED</td>
<td>1412</td>
<td>09:03 AM</td>
<td></td>
<td>Delayed 17 minutes</td>
</tr>
<tr>
<td>Houston</td>
<td>UNITED</td>
<td>353</td>
<td>10:43 AM</td>
<td>62</td>
<td>On Time</td>
</tr>
<tr>
<td>Kingman</td>
<td>United</td>
<td>7155</td>
<td>09:20 AM</td>
<td></td>
<td>Delayed 14 minutes</td>
</tr>
<tr>
<td>New York</td>
<td>UNITED</td>
<td>534</td>
<td>08:16 AM</td>
<td>75B</td>
<td>Delayed 16 minutes</td>
</tr>
<tr>
<td>Kona</td>
<td>UNITED</td>
<td>1296</td>
<td>08:40 AM</td>
<td></td>
<td>Delayed 19 minutes</td>
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<tr>
<td>Kauai Island</td>
<td>UNITED</td>
<td>297</td>
<td>08:35 AM</td>
<td></td>
<td>Delayed 19 minutes</td>
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<tr>
<td>Orlando</td>
<td>UNITED</td>
<td>261</td>
<td>08:49 AM</td>
<td></td>
<td>Delayed 13 minutes</td>
</tr>
</tbody>
</table>
"We are Big Brother...well...we have the capability to be...."
## Kinect for Windows v2

**Brand new device**
- Not an upgrade
- Replaces the prime sense device purchased by Apple

**2 to 3 times better functionality across the board**
- Specs that are unmatched by any current 3D camera
- Fidelity so good it’s capable of detecting human pulse

### All-new:
- Active IR camera enables it to see in the dark. And by using advanced three-dimensional geometry, it can even tell if you’re standing off balance.
- Multi-microphone array, the advanced noise isolation capability lets the sensor know who to listen to, even in a crowded space.

**Officially:** “Kinect for Windows v2 worldwide launch next summer.”
**Unofficially:** “…we’ll ship in spring.”
The Data Sources

Color

Depth

Infrared

Audio, Speech, Interactions

Body

Body
The concepts of engagement and Good User Interaction Design change the way we design and build software in many Use Cases.
...when the goal is better user experiences

The hardware, tools, plumbing and platform for good user Interaction Design in Applications are powerful and available now.
...and will just continue to get better, cheaper, powerful and more available

NUI provides a number of challenges to good User Interaction Design:
- Large and Intuitive Controls
- Large Form Factors
- Naturalizing Interactions with Virtual and Physical Objects
- Fidelity and environment weaknesses of 3D Cameras

Within a realistic time frame NUI computing will be the norm
...just like the mouse & keyboard are
More info on InterKnowlogy:
- www.InterKnowlogy.com
- www.vimeo.com/InterKnowlogy

More info on Actus Software:
- www.Actus-Software.com

About Tim Huckaby…
- Founder/Chairman, InterKnowlogy
- Founder/Chairman, Actus Software
- Microsoft® Regional Director – Southern California
- Microsoft® .NET Partner Advisory Council Founder / Member
- Microsoft® MVP – Kinect for Windows
- INETA Speaker – International .NET Users Group Association
- Board Member: Association for Competitive Technology
- Board Member: DevIntersection
- Board Member: Microsoft Healthcare Partner Advisory Board
- Author / Speaker

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