



Microsoft Research Asia **Faculty Summit 2012**



Kinect for Windows – An Update for Researchers

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Microsoft Research Connections

Special thanks:

Prof. Patrick Baudisch, Hasso Plattner Institute
and Kinect for Windows product group

Microsoft Research Asia
Faculty Summit 2012

What's New in NUI

Where Are We, and Where Might We Go?

NUI Today

What is NUI?

How did we
get here?

NUI Challenges

NUI
Research

NUI
Opportunities

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The Kinect Effect



KINECT™
for Windows®

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For me...

**NUI is how we can best interact
with the**

**increasingly ubiquitous
computing world**

**of our present
– and future**

What's your perspective?

If you had to build an interactive system
for 1-year olds

What would be your design objectives?

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Quiz

What year is this?



We are still living in 1968

INTRODUCTION

OVERALL ABOUT PROGRAM
NLS AS AN "INSIDE-LOOK"
CONTROL TECHNIQUES
NLS IMPLEMENTATION
USAGE
ACTIVITIES
CREDITS

We are still living in 1968



We are still living in 1968

But the world is **changing...**

"NUI"



Computers seeing & hearing us,
as we see & hear,
via: **cameras, mics**

[image: benko wilson]

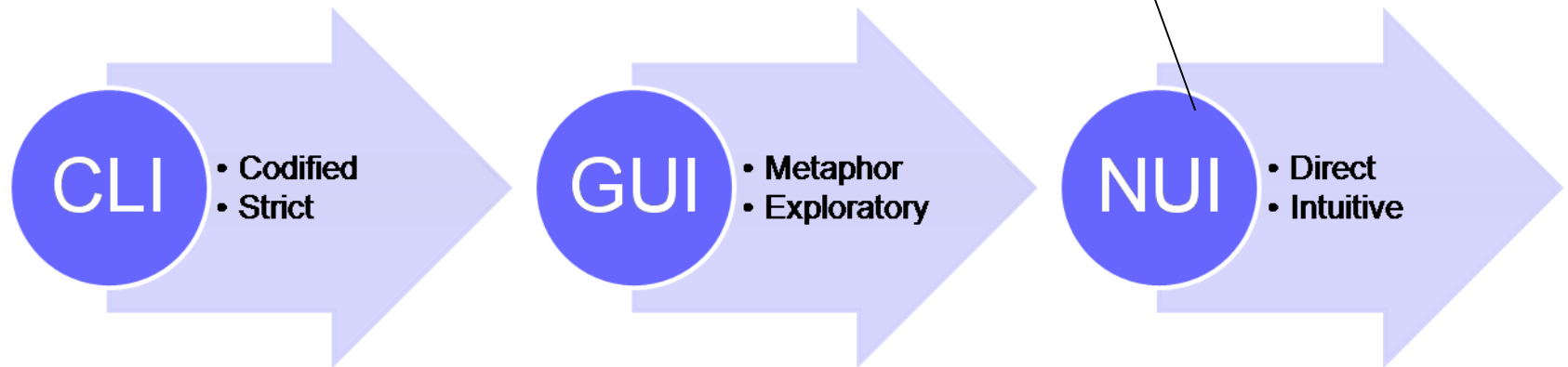
Design Influences

don't so much come from the
workplace today,
but from...

**film,
animation,
games,**

...

**Steve Mann:
"metaphor-free computing"**



[wikipedia]

in the 70s, it seemed **fair to assume**
that users had worked in an office

2012: the office assumption has **failed**

800 million PCs



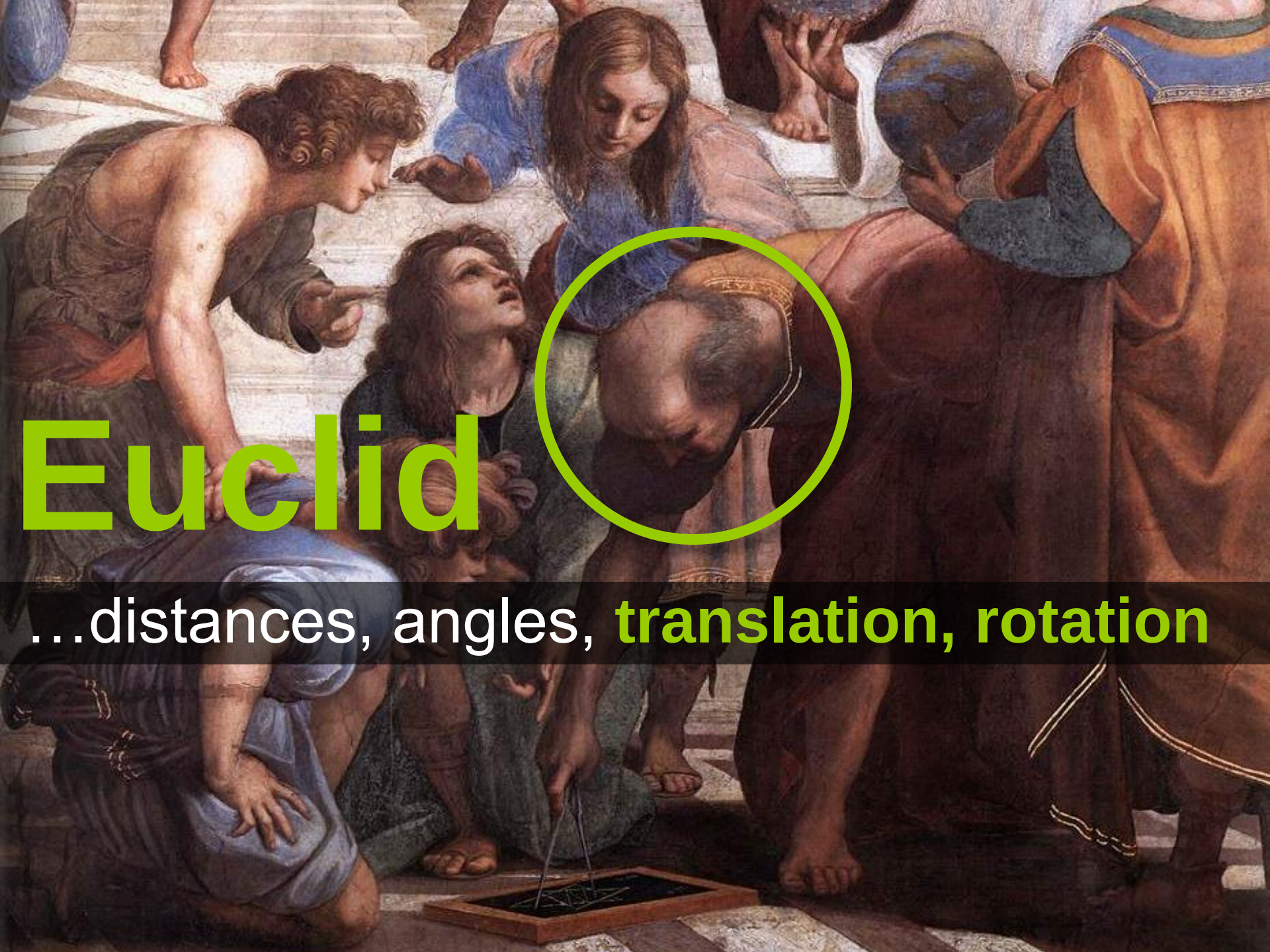
5 billion
mobile devices



So what can we rely on **her knowing?**

The **physical world** around us

...touching, pointing, distances
inertia, spatial memory ballistics
= very few rules & highly consistent

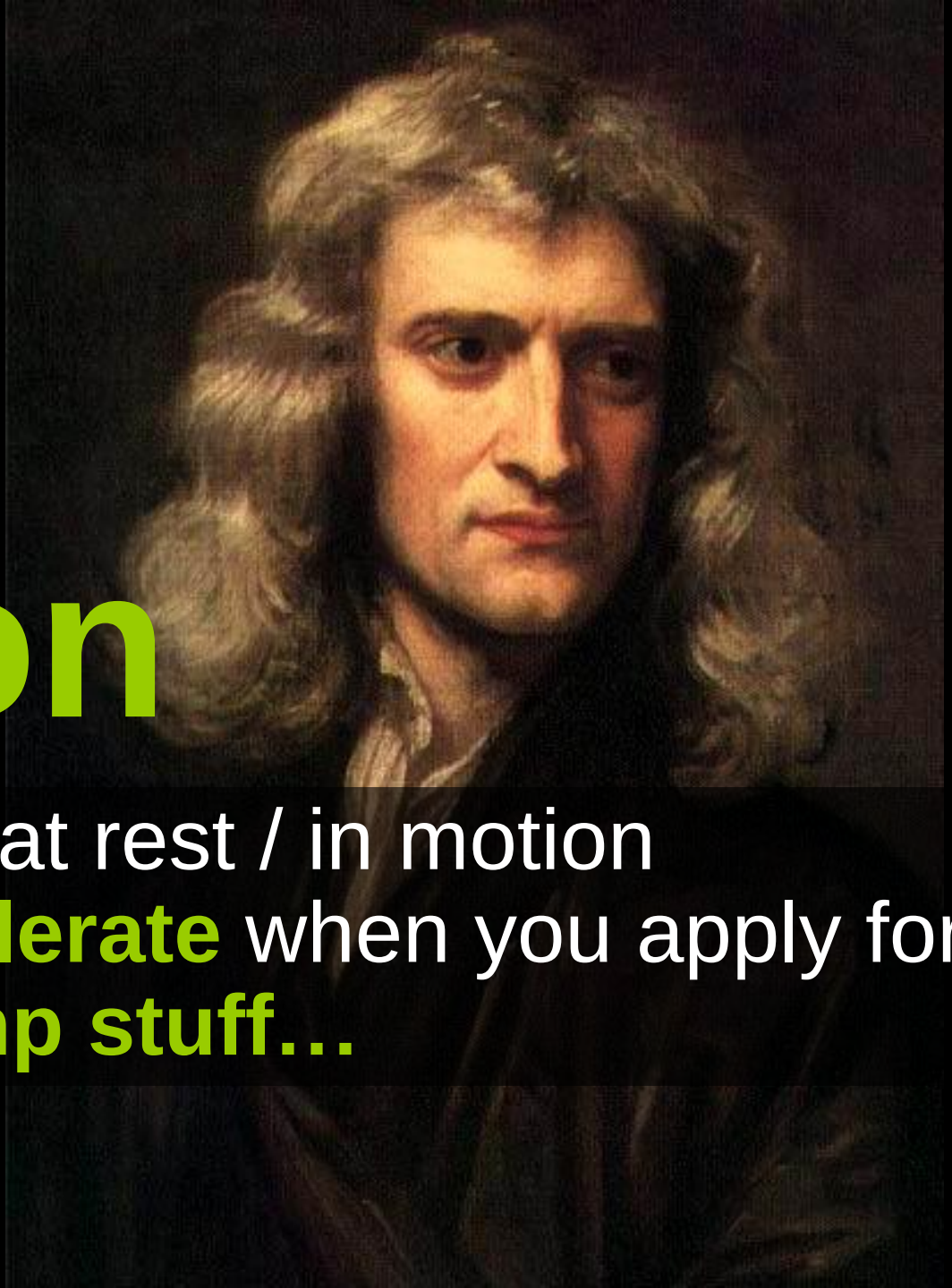


Euclid

...distances, angles, **translation, rotation**

Newton

1. objects **stay** at rest / in motion
2. objects **accelerate** when you apply force
3. you can **bump stuff...**



#1 NUI: *(good)*

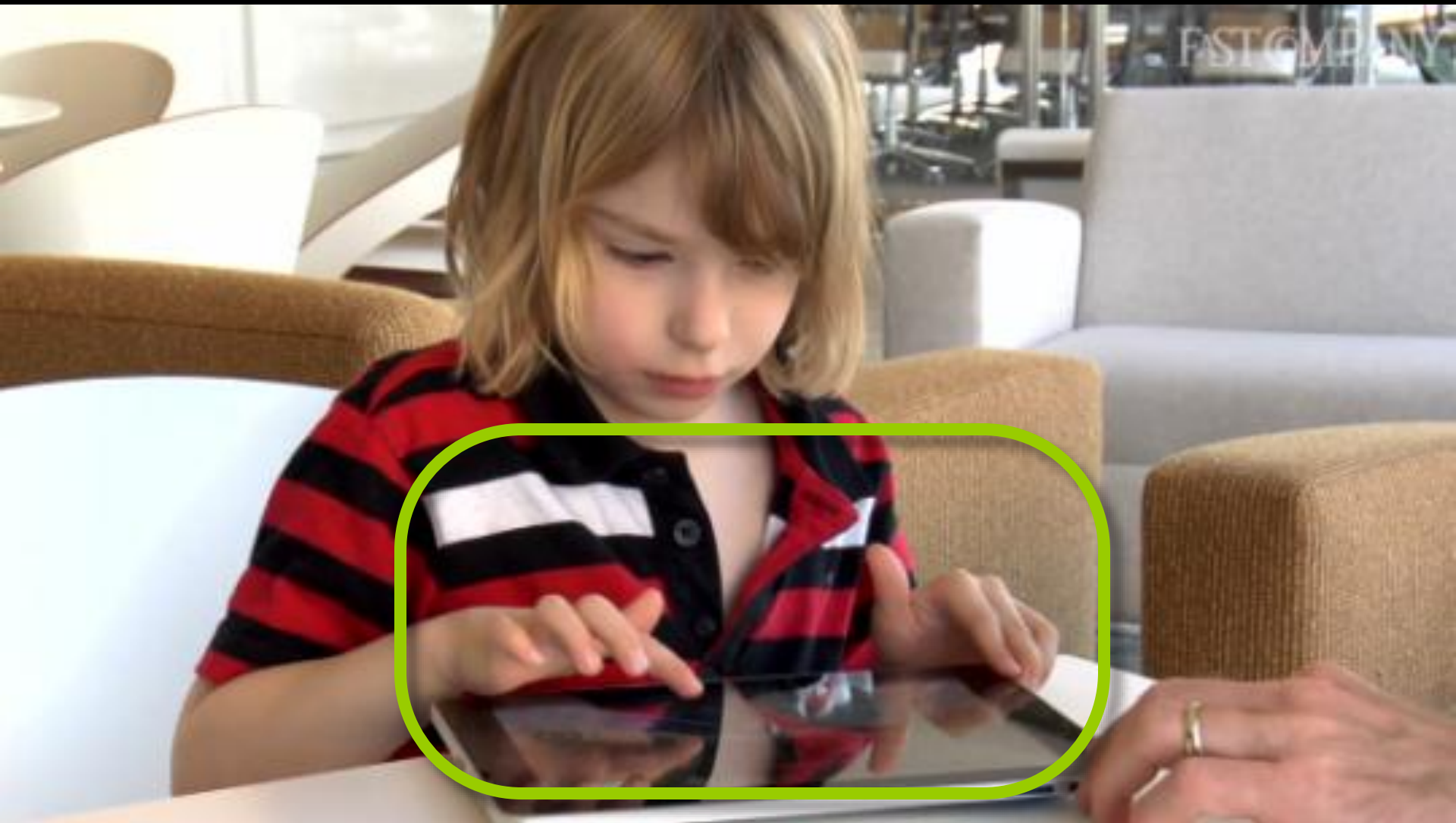
An interface a "1-year-old" can operate

#2 NUI: *(better)*

An interface that a user can operate
who only knows **Euclid & Newton**



The screen connects **virtual with physical**



Natural = user and objects form **one space**

#3 NUI: *(best?)*

(ideally) a single Euclidian/Newtonian space that includes **display(s) and user**

Basic NUI principles:

- NUI brings together the physical and the virtual
- To facilitate a seamless, transparent experience
- People-centric, not the computer
 - **and not the interface**

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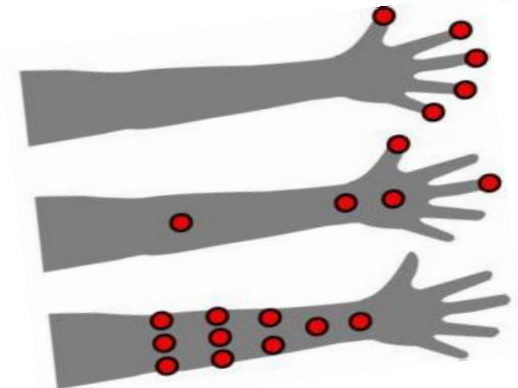
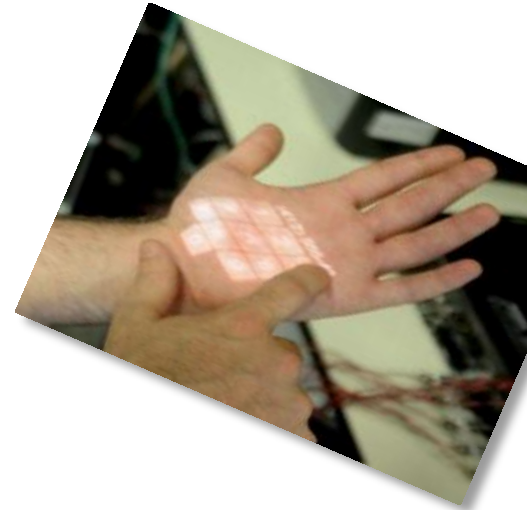
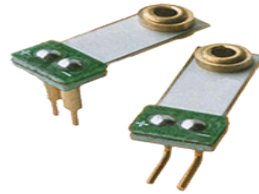
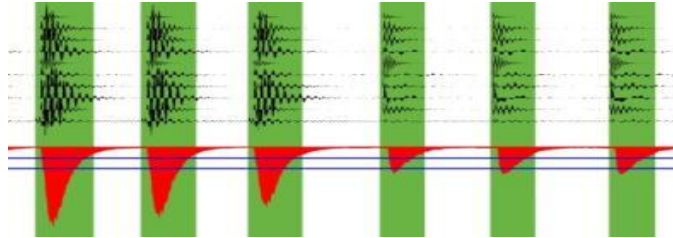
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Skinput Project

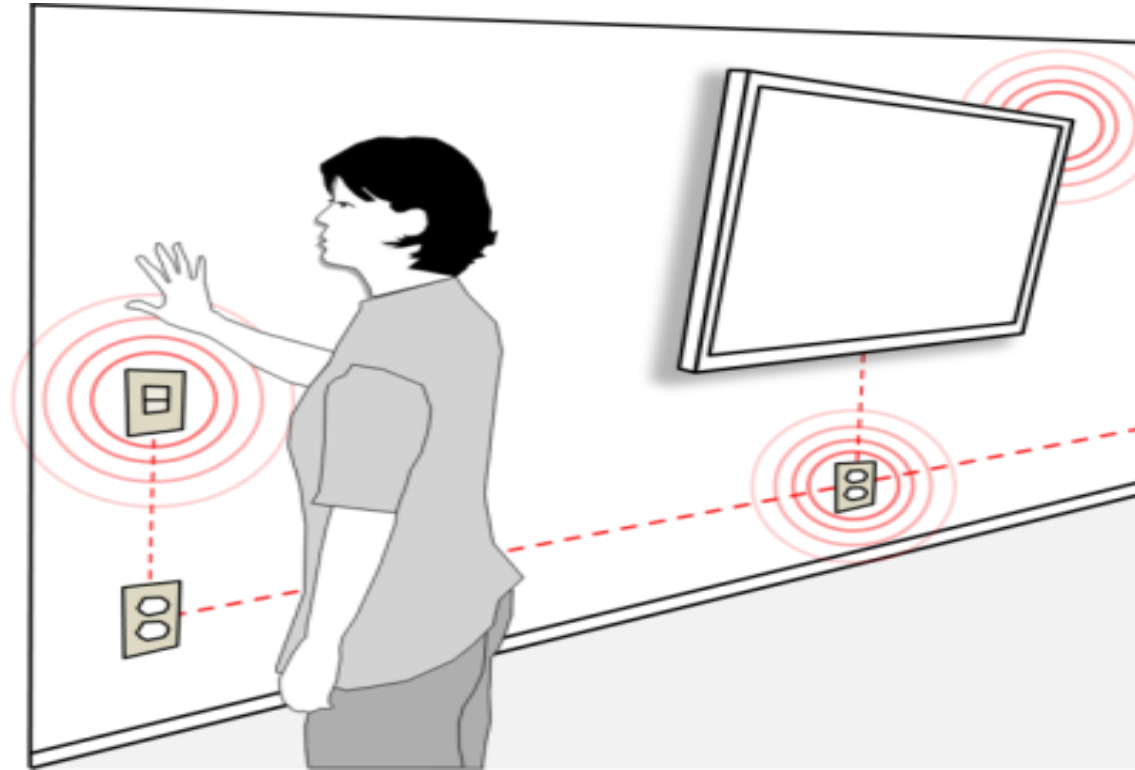
<http://research.microsoft.com/en-us/um/redmond/groups/cue/skinput/>



Joint work with CMU

Humantenna Project

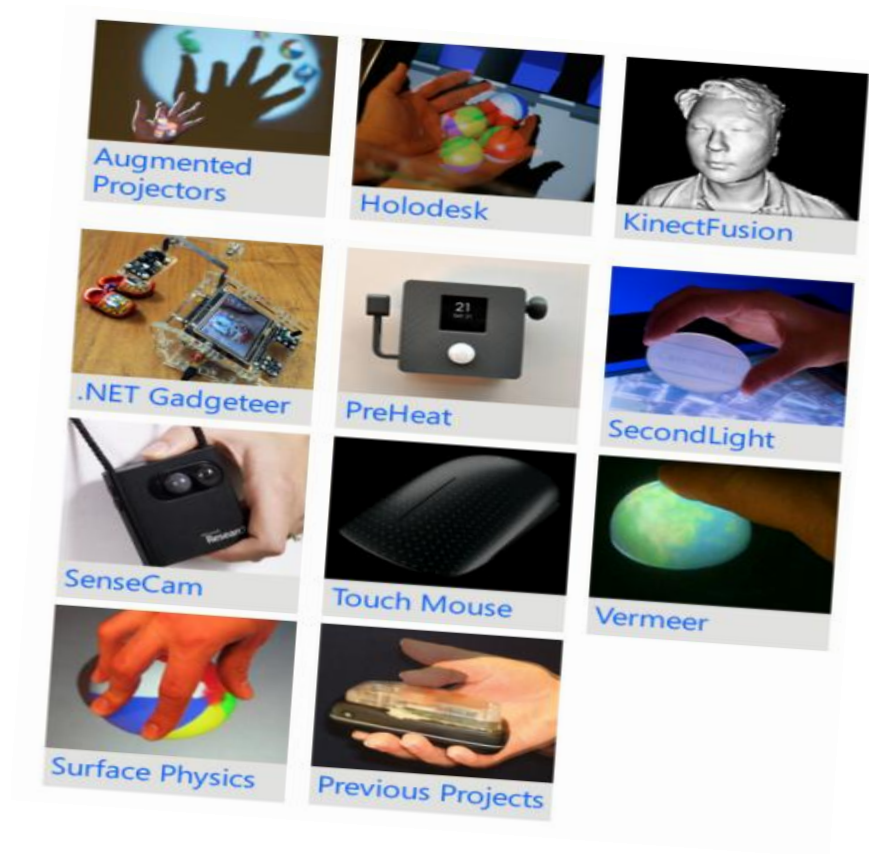
<http://research.microsoft.com/en-us/um/redmond/groups/cue/humantenna/>



Joint work with UW

Sensors & Devices Group

<http://research.microsoft.com/en-us/groups/sendev/>



Joint work with (multiple, EU)

Natural Interaction Group

<http://research.microsoft.com/en-us/groups/natural/>



Joint work with (multiple, e.g. CMU, UMD, Cornell, UIUC, UCLA, TU Lisbon, RWTH Aachen, HPI, Newcastle...)

Computer Vision Group

<http://research.microsoft.com/en-us/groups/vision/>



Medical image analysis



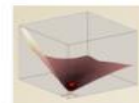
i2i: 3D visual communication



Image and video editing



Object class recognition



Discrete optimization in vision



C-Slate for remote collaboration



Geometric modelling from images



Visual tracking



Joint work with (multiple, EU)

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USE THE POWER OF KINECT TO CHANGE THE WORLD

Be at the forefront of innovation. Explore how Kinect for Windows transforms the way people interact with technology. Help unlock the possibilities.

PRODUCT FEATURES



Purchase

Learn where to purchase a Kinect for Windows sensor, and start developing today.

[BUY ONLINE >](#)

Discover

What's possible with Kinect for Windows? See how Kinect is being applied to fields beyond gaming.

[EXPLORE GALLERY >](#)

Develop

Download the SDK and Toolkit, along with access resources to help develop Kinect for Windows applications.

[DOWNLOAD SDK >](#)

用 KINECT 的 力量改变世界

处于创新的最前沿。了解 Kinect for Windows 如何改变人与技术的交互方式。帮助开启无限可能。

产品功能



购买

了解何处可以购买 Kinect for Windows 传感器，并立即开始 开发。

在线购买

开发

下载 SDK 和工具包以及访问资源，以帮助开发 Kinect for Windows 应用程序。

下载 SDK

探索

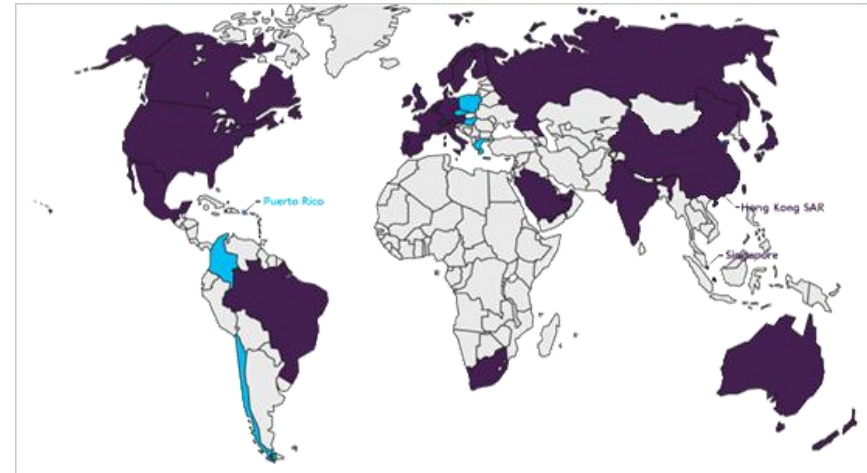
Kinect for Windows 有哪些功能？了解如何将 Kinect 应用于游戏以外的领域。

浏览库



Kinect for Windows v1.6

- Released October 8, 2012
- Wider availability
 - **China!**
 - Next: Chile, Colombia, Czech Republic, Greece, Hungary, Poland, Puerto Rico
 - 38 markets by end of year
- New features:
 - Extended sensor data access
 - Improved developer tools
 - Greater support for operating systems





Kinect for Windows v1.6 Features - 1

Extended sensor data access

- Data from sensor's 3-axis accelerometer now exposed
 - Enables detection of sensor's orientation
- Extended-range depth data beyond 4m
 - Lower accuracy, but extends usage scenarios
- Color camera settings
 - Brightness and exposure, to tune sensor to environment
- Infrared stream now exposed
 - Many scenarios, such as calibrating other color cameras to the depth sensor or capturing grayscale images in low-light
- Faster toggling of IR to support multiple overlapping sensors



Kinect for Windows v1.6

Features - 2

Improved developer tools

- Kinect Studio updated to support all new sensor data features
- German speech recognition language pack
- Skeletal tracking now supported on multiple sensors within a single application
- New samples
 - How to use all the new SDK features
 - New sample demonstrates a best-in-class UI based on the Kinect for Windows [Human Interface Guidelines](#)
 - "Basic Interactions – WPF sample"

- en-AU
- en-CA
- en-GB
- en-IE
- en-NZ
- es-ES
- es-MX
- fr-CA
- fr-FR
- it-IT
- ja-JP



Kinect for Windows v1.6 Features - 3

Greater support for operating systems

- Windows 8 desktop compatibility
- Development with [Visual Studio 2012](#) and [Microsoft .NET Framework 4.5](#)
- Virtual Machine support
 - Works on Windows running in a [VM](#)
 - Tested: Microsoft Hyper-V, VMWare, Parallels

-
- Remember: all new features are supported on the **Kinect for Windows sensor**
 - ***Not the Xbox 360 sensor!***
 - See www.kinectforwindows.com for availability

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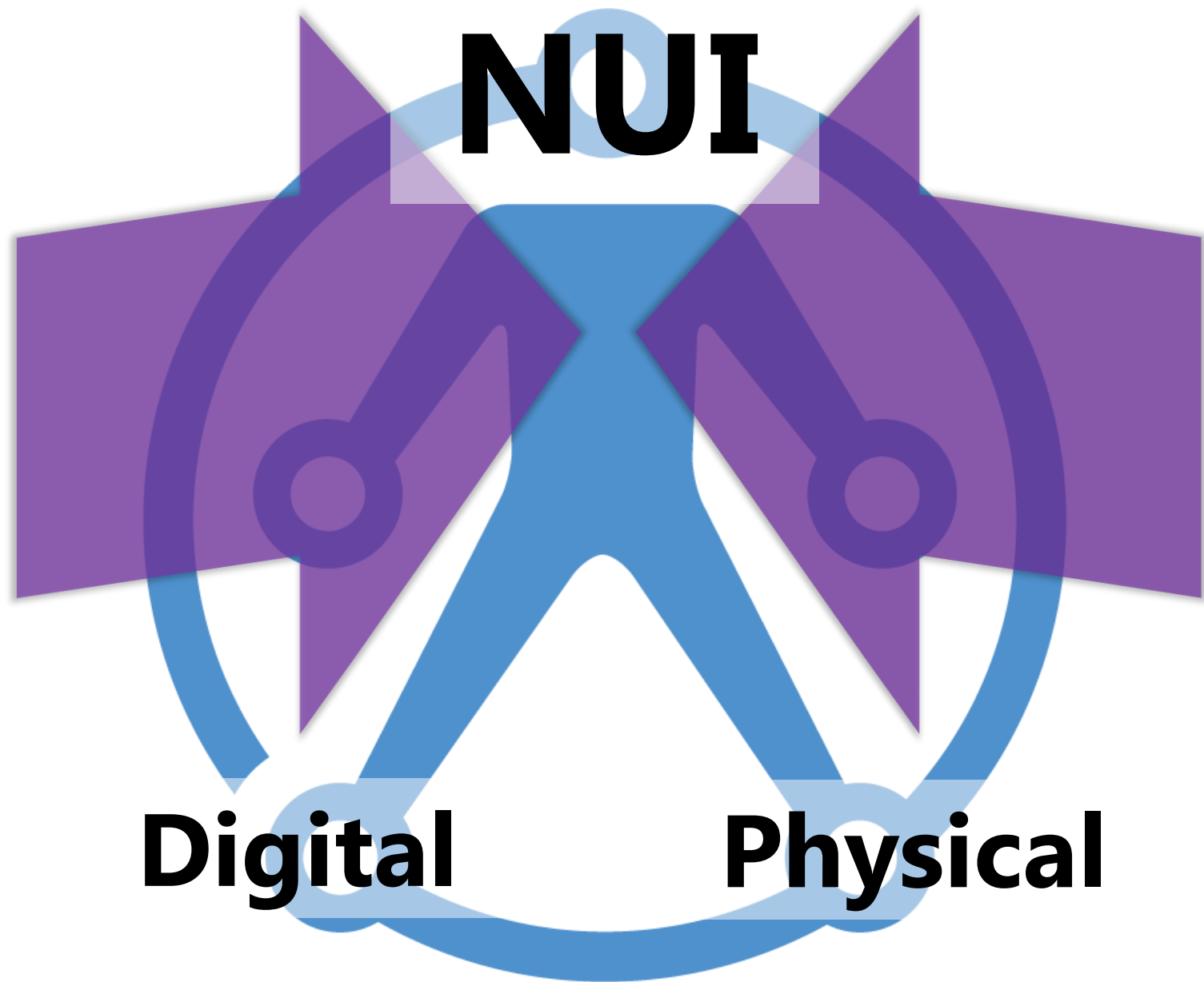
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Resources

<http://microsoft.com/next/>

<http://kinectforwindows.com>

<http://channel9.msdn.com/coding4fun/kinect/>

<http://microsoft.com/education/facultyconnection>

<http://research.microsoft.com>

<http://research.microsoft.com/NUI>

stansley@microsoft.com

<http://research.microsoft.com/~stansley>

@dswtan

#KinectWindows

Thank you!