

Hillcrest Labs

MEPTEC 10th Annual MEMS Technology Symposium

May 2012



Hillcrest Labs: Experts in Motion



Founded: 2001

Based: Rockville, MD, USA

Industries: Smart TV, Mobile, PC, Gaming, Industrial, Specialty

Summary: Market leader in multiplatform motion software and products. Provides motion solutions under the Freespace® brand.

10+

years of experience developing motion technologies and new user experiences

200+

patents filed worldwide covering essential methods for effective motion control

250+

man-years delivering motion control products and motion-enabled applications

Millions

of units with Freespace® MotionEngine™ software shipped annually



LG



Roku



Many CE Products Use Motion Today



SMART TVS



MOBILE DEVICES



GAME CONSOLES



SET TOP BOXES



PC PERIPHERALS

The Opportunity is Much Larger Than CE



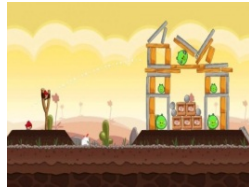
Motion Enables Advanced Applications

Smart TV

Web Browsing +
Online Commerce



TV-Based Gaming



Easier Content
Navigation



App-Store
Compatibility



New Interactive
Experiences



Mobile

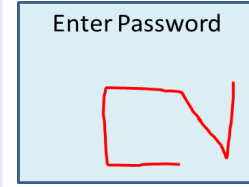
Immersive Gaming



Augmented Reality



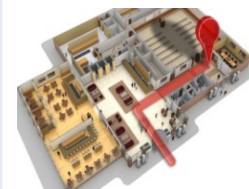
Gesture Recognition



Context Awareness



Pedestrian Navigation



Inertial and
Magnetic Sensors

(Accelerometer,
Gyroscope,
Magnetometer)

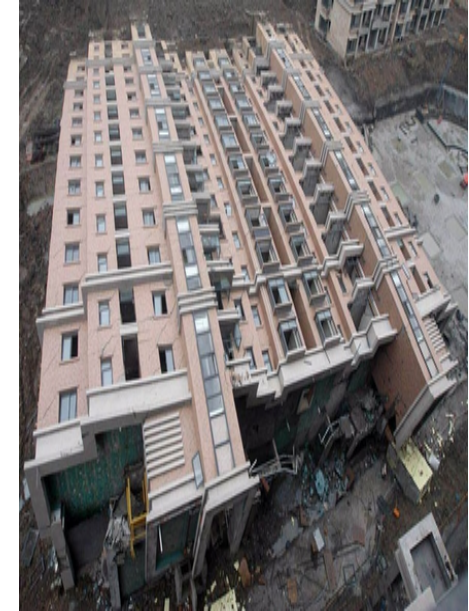
Better Motion Processing Provides Foundation



Strong Foundation
Essential



Errors Accumulate
over Time

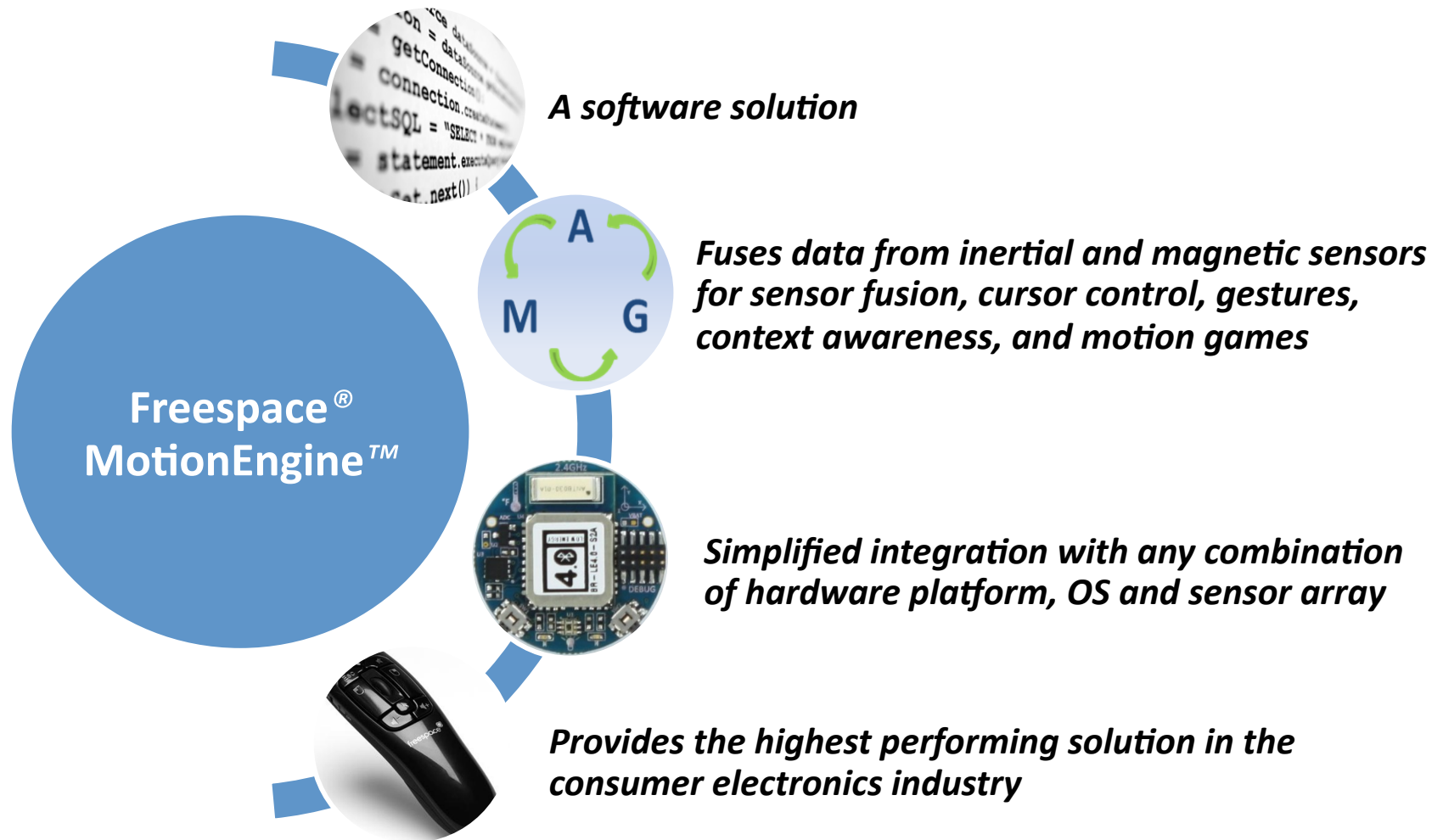


Eventually
Leading to Failure

Hillcrest's superior calibration and motion processing provide a stronger foundation for all advanced apps to function

Freespace[®] MotionEngine[™]

Our flagship software solution for Smart TV and Mobile devices



Mass Market Products

TCL V7500 Smart TV



- Newly announced partnership with TCL, the leading TV supplier in China
- Motion used to implement point and click, gestures and virtual controls.

LG Electronics INFINIA Smart TV



- Freespace shipped with LG Smart TVs for 2+ Years
- “Magic Motion Remote” is powered by Freespace technology
- LG Smart TV UI optimized for motion and pointing

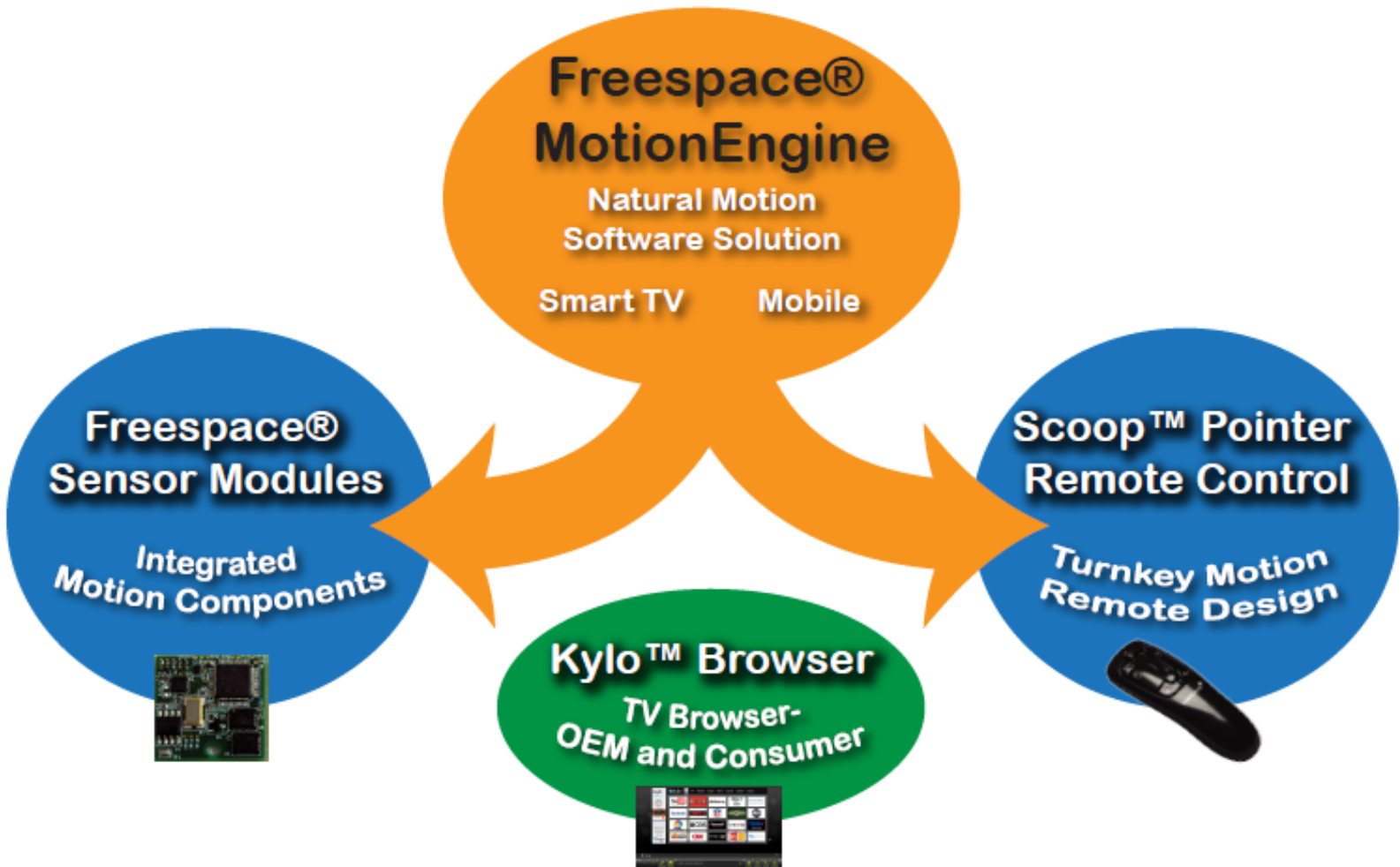
Roku 2 Set Top Box



- Roku 2 XS player ships with Freespace enabled remote control
- Angry Birds application loaded for motion enabled gaming

Freespace® MotionEngine™ is featured in millions of units in consumers' hands and living rooms today.

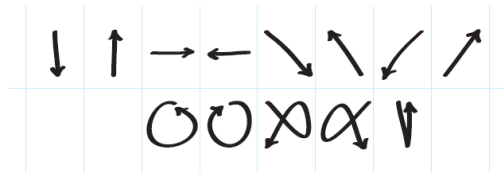
Hillcrest's Comprehensive Product Line



Freespace[®] Gesture Recognition Engine

Character Gestures

- Use simple pre-programmed or user defined gestures to interact with and control your phone



Virtual Controls

- Navigate menus, media, the web and more through intuitive and simple controls emulating dials or knobs including tilting, twisting and moving side to side



Event Gestures

- Use accurate sensor fusion data to trigger commands from motion events including tapping, slapping and shaking



Freespace[®] Cursor Library

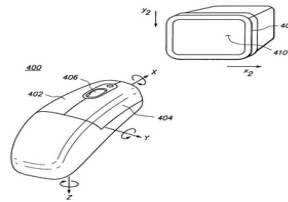
Freospace Cursor Library translates sensor fusion output into precise on-screen cursor control

Exceptional Pointer Control



- Highest resolution pointing with the lowest latency insures ease of use
- Exclusive features provide smooth and precise motion

Essential Patented Features



- Hillcrest's patented Orientation (Roll) Compensation is essential for 'lean back' use
- Tremor Removal adjusts for human shake
- Dynamic calibration eliminates sensor drift

Deep Systems Expertise



- 10 years experience developing pointing-enabled User Experiences
- Deep experience in sensors, RF, and systems latency issues

Hillcrest's Freespace[®] Cursor library provides most precise and efficient cursor control

Freespace MotionEngine™ Mobile



Superior Performance

Both 9-axis and 6-axis sensor fusion is enhanced by advanced static and dynamic calibration, including magnetic interference compensation and gyro-ZRO.



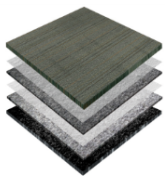
Lowest Costs

Sensor Agnostic solutions improve negotiation leverage with sensor suppliers and reduce integrations costs when changing sensor providers.



Minimal Power Consumption

Optimizing processing time and location, as well as performing intelligent sensor management, greatly reduce power consumption.



Flexible Implementation Options

Use the app processor or a separate sensor hub, configure with various sensor combinations, and use Android, Windows 8, or any OS.

Essential Patent Portfolio for Motion

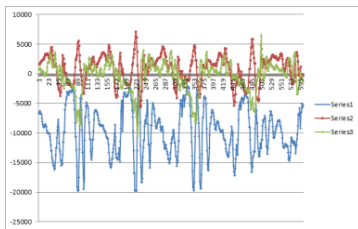
An essential portfolio of litigation tested patents covers critical methods to provide superior motion performance in smartphones and tablets.

MotionEngine Mobile Value Added Features

Core differentiators provide the foundation for a better application experience

Tremor Identification

Identifies phone situation and on-body placement.



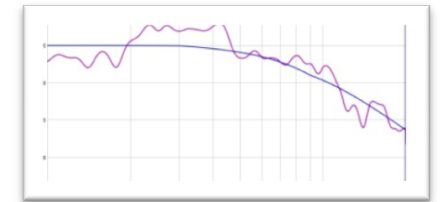
Orientation Detection and Compensation

Precisely measures device orientation



Quaternion Smoothing

Dynamic motion processing to minimize jitter



Gaming

Context Awareness

Gestures/Virtual Controls

Cursor Control

Image Stabilization

Gaming

Context Awareness

Gestures/Virtual Controls

Cursor Control

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