Docket #: S09-343

Marker-less Motion Capture with Time-Of-Flight Sensors on Parallel Processing Hardware

A team of researchers from the Stanford Artificial Intelligence Laboratory have developed a portfolio of patented innovations that harness depth sensing technology to analyze human motion for touch-free control of devices and motion capture. This marker-less motion capture invention uses parallel processing processors (such as a programmable GPU) to efficiently solve high-dimensional perception problems and enable real-time detection and tracking of motion.

Additional Technologies in this Portfolio:
"Marker-less Tracking of Human and Articulating Bodies using Parallel Processing Hardware" (Stanford Docket S09-319)
"Detecting and Classifying Body Parts and Gestures in Range Images" (Stanford Docket S09-369)
"Ergonomic Touch-Free User Interfaces" (Stanford Docket S10-147)
"Touch –Free Control of Devices" (Stanford Docket S10-148)

Applications

- **Human-machine interface** for touch free interactions with devices such as:
  - computers - web-browsing, data entry
  - television - gesture-based remote controls
  - smart phones
  - gaming consoles
- **Motion capture** for:
  - animation
  - task demonstration and teaching for industrial and robotic applications
  - rehabilitation and athletics

- **Surveillance and security**

Advantages

- Requires only **one camera**
- Requires **no marking** of the articulated body
- **High precision**, even under real-time constraints

Publications

- Ganapathi, Hariraam Varun, Christian Theobalt, and Sebastian Thrun. "Motion capture with low input data constraints" US Patent 8,994,790

Patents

- Published Application: 20110205337
- Issued: 8,994,790 (USA)

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