

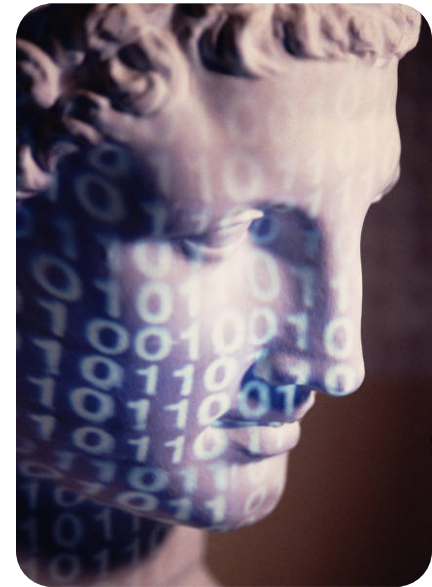
Hybrid Model for 3D Shape Measurement

Industry Need:

Real time 3D shape measurement techniques suffer from limitations including difficulty in measuring smooth surfaces or step-height, difficulty in reconstructing images in real-time, or difficulty in achieving pixel-level resolution.

Solution:

ISU researchers have developed a hybrid model for 3D shape measurement enabling absolute position measurement at very high resolution, and rapid 3D shape measurement.



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About The Technology

- **Increases** measurement speed by 11-fold compared to existing approaches
- **Enables** measurement of step-height objects
- **Allows** simultaneous measurement of multiple objects

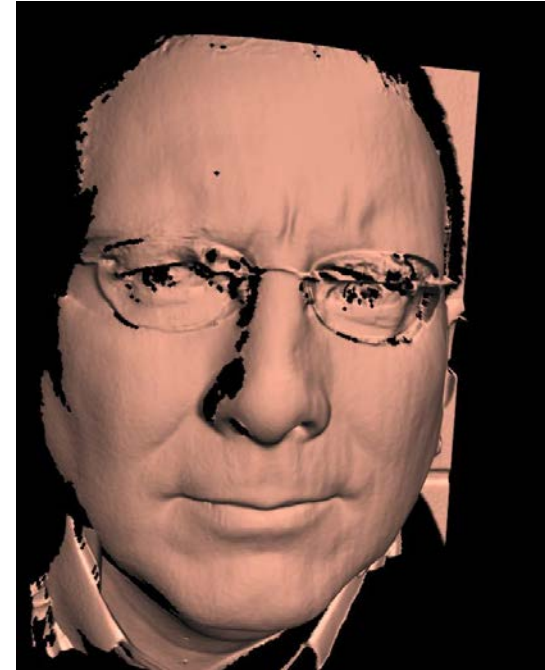


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Application Areas

- ***Manufacturing:***
 - *Industrial Automation*
 - *Non-destructive evaluation*
 - *Quality Assurance*
- ***Security***
- ***Medical Applications***



Hybrid Model for 3D Shape Measurement: Licensing/Commercialization Opportunity

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Status

- **Development Stage:**



- *Feasibility testing has been demonstrated using complex objects and multiple objects*

- **Intellectual Property Status:**

- *ISURF #s 3674/4024*
- *Patent pending*

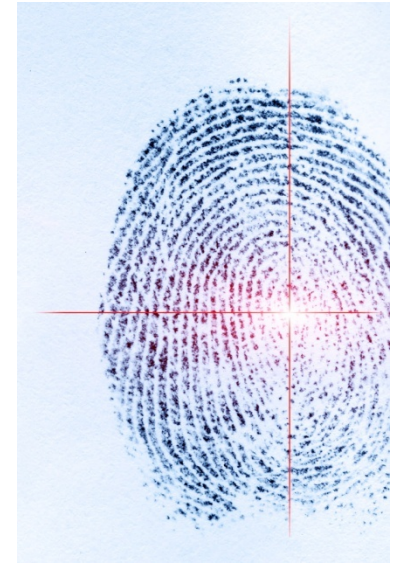
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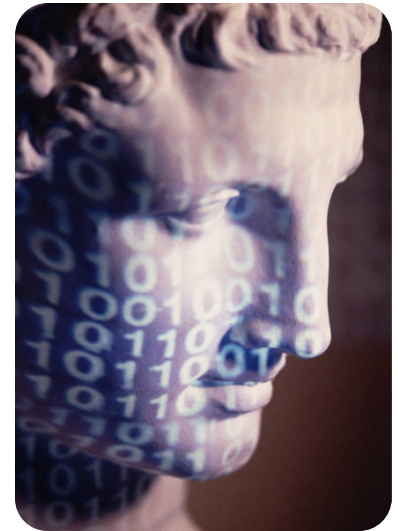
3-D Shape Compression Using Holoimage

Industry Need:

The use of 3-D imaging technology has become increasingly commonplace for industrial and scientific applications. However, because of the throughput and size of the data generated through 3-D imaging systems, it is difficult to store and transmit 3-D data simultaneously.

Solution:

An approach, termed Holoimage, for encoding a 3-D surface shape into a 2-D image and decoded using standard 2-D techniques.



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About The Technology

- **Efficient**-- enables compression of 3D imaging data for real-time storage and transmission
- **Versatile** -- compression method works with a variety of file formats and is a 'plug-and-play' solution
- **Robust** -- provides good image reconstruction quality
- **Precise**--can directly encode depth information into 2D images



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Application Areas

- *3-D Imaging*
- *Storage of HD 3-D Information*
- *Real-time 3-D video transmission and compression*

Examples:

- *Virtual reality*
- *Gaming*
- *Movie industry*
- *GIS*
- *Etc.*



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Status

- **Development Stage:**



- **Intellectual Property Status:**

- *ISURF #s 3821/4000*
- *Patent pending*

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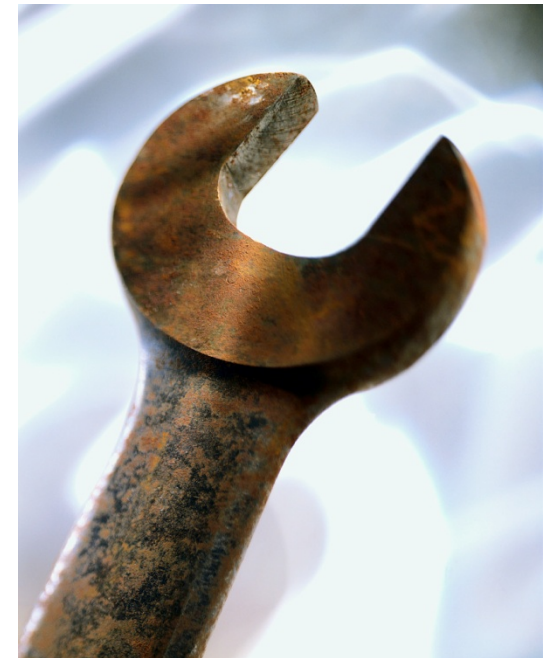
Tool Tracker for Manufacturing

Industry Need:

During various manufacturing steps, such as assembly, welding, painting, etc. it is often necessary for a worker to use a hand-held tool. However, it can be difficult, if not impossible, for a worker to consistently duplicate exact work from one assembly to another assembly

Solution:

A method and system which not only can determine whether a particular manufacturing operation is carried out, but also determine whether the manufacturing operation was carried out at the correct location and/or in the correct sequence.

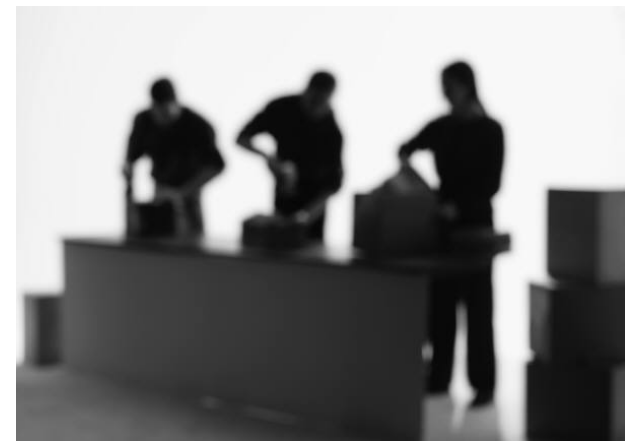


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About The Technology

- **Detects and prevents** mistakes during the manufacturing process by tracking the position and operation of hand-held tools and providing feedback in the event that the manufacturing process is not proceeding as prescribed.

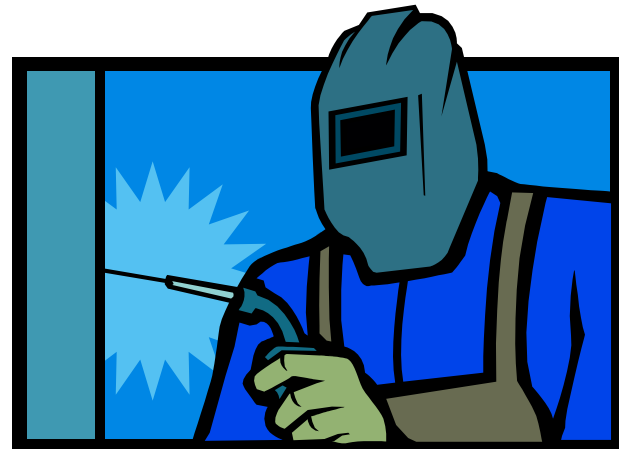


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Application Areas

- *Manufacturing*
 - *Assembly*
 - *Welding*
 - *Painting*
- *Training*



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Status

- **Development Stage**



- **Intellectual Property Status:**

- *ISURF #3594*
- *Pending US and foreign patents*

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Tool Tracker for Manufacturing : Non-Exclusive Licensing/Commercialization Opportunity

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Context Sensitive Real-Time Data-Driven Music Algorithms

Industry Need

By adding sound to our visual cueing, we more fully understand our environment, and numerous efforts to represent data with sound have been performed. However, these efforts have mapped data directly to various aspects of sound, causing a result that is difficult to understand or irritating to listen to.



Solution

A set of algorithms for creating music based on real time data. This approach allows aural information to be combined with visual cueing to enhance data analysis.

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About the technology

- **Versatile** -- can be used with diverse types of data sets
- **Flexible** -- use of atonal compositional techniques requires less rigid syntax than tonal music and enables real-time sonification
- **Listenable** --musical approach creates pleasing aural results



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Application areas

- *Sonfication of data for enhanced analysis and understanding*
- *Ambient awareness*
- *Composition tool for creating music*
- *Augmentation of remote control of tractors or other working machinery*
- *Enhancement of viewing of interactive displays*

- *Examples*
 - *Manufacturing or production environment ; equipment monitoring*
 - *Transportation ; long-haul trucking*
 - *Security*
 - *Etc.*

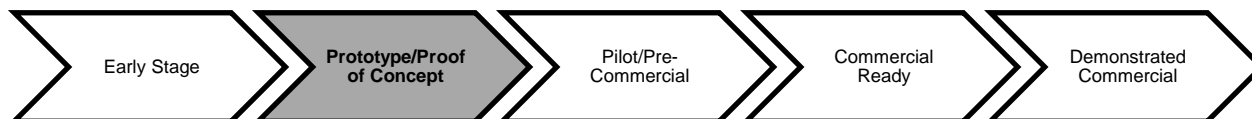


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Status

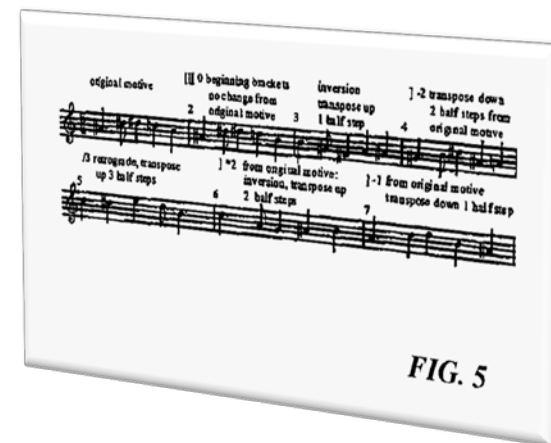
- **Development Stage**



- *Proof-of-concept in laboratory testing*

- **Intellectual Property**

- ISURF #3074
- Patent issued: US Patent No. 7,304,228



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Table Top Augmented Reality System

Industry Need

The rise of direct manipulation interfaces, like those found on tablet computers or smart phones, along with the increase in consumer-grade mixed reality systems, and the application of virtual reality in design and manufacturing systems is creating a need for 3D interfaces for users to be able to interact with technology.



Solution

AugmenTable, a table top augmented reality display that can be used for conceptual design and prototyping.

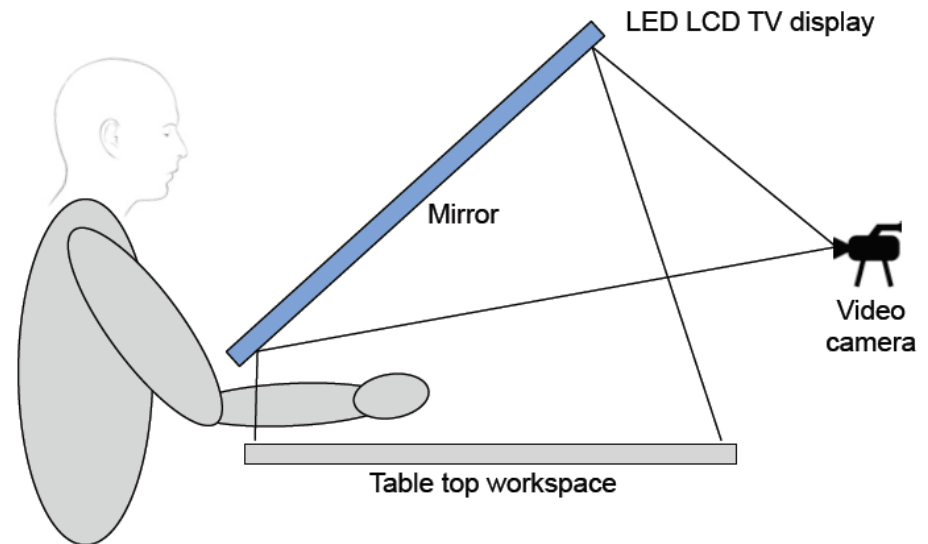
About the Technology

- **Immersive** augmented reality environment enables direct manipulation environment
- **Allows** users to directly manipulate virtual objects using their bare hands in a way that is similar to manipulating real objects
- **Does not** require wearable equipment
- **Has a small** footprint and can be used to create affordable augmented reality workstations



Application Areas

- *Manufacturing*
 - *Conceptual Design*
 - *Prototyping*
- *Product Lifecycle Management*



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Status

- **Development Stage**



Early Stage

Prototype/Proof
of Concept

Pilot/Pre-
Commercial

Commercial
Ready

Demonstrated
Commercial

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Table Top Augmented Reality System: Informational Overview