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**NEWSLETTER**

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Editor: Nicola D'Apuzzo

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# Introduction

## Human Body Measurement Newsletter

### Homometrica Consulting introduces the first number of the new newsletter

*by the Editor Nicola D'Apuzzo, Homometrica Consulting, Zurich, Switzerland*

I am very glad to introduce and present the first number of the Human Body Measurement Newsletter. The topics of the newsletter regard 3D human body measurements. It will be regularly published and freely distributed over Internet and by e-mail to the subscribers. Its intentions are to inform about new development and application in the field of human body measurement. It is targeted to all readers interested in this technology, from companies producing such systems and solutions, through institutions involved in the research, to users of this technology and to people that wish to stay updated and informed about new technologies and their applications.

This first number of the newsletter includes presentations of new products for the 3D measurement of the human body and some interesting new applications of this technology, as well as contributions from the point of view of institutional research.

You are kindly invited to subscribe to the newsletter to automatically receive the new numbers. You are also invited to forward the present number to colleagues or friends who could be interested. Comments and possible contributions to future newsletters are welcomed, please contact the editor at the following address: info@homometrica.ch.

Hoping you will find interesting this first number, I wish you pleasant moments by reading it.

# Technology

## Intellifit revolutionary full body scanner

### Millimeter-waves based technology allows 3D scanning without undressing

*by Nicola D'Apuzzo, Homometrica Consulting, Zurich, Switzerland*


*Intellifit System in a retail store (image from Intellifit)*

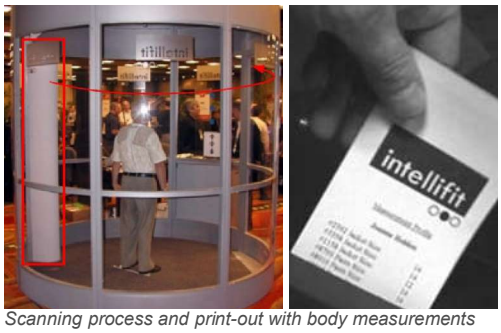
The Intellifit System applies a cylindrical holographic imaging technology that allows to perform a 360-degree whole body scan in less than 10 seconds all while the person remain fully clothed. The Intellifit scanner uses an innovative 3D body scanning technology recently developed at Pacific Northwest National Laboratory in Richland (WA, USA). PNNL researchers have developed a millimeter-wave holographic screening device that uses nonharmful, ultrahighfrequency radio waves to obtain accurate body measurements. A millimeter wave array/transceiver illuminates the human body with extremely low-powered millimeter waves. The radiation (a class of non-ionizing radiation not harmful to humans) penetrates clothing and reflects off the body. The reflected signals are collected by the array/transceiver and analyzed by a high-speed image processing computer.

The technology developed by PNNL was firstly intended for security applications. In fact, the reflected signals can be analyzed to detect concealed objects made of any material, The company SaveView Inc. will exploit the technology for this specific application. On the other hand, Intellifit Corporation translates this technology into a complete solution to extract 3D human body measurements for custom fit applications.

Intellifit System is composed of the 3D scanner based on the millimeter-waves technology developed by PNNL and the accompanying software developed by Intellifit. The system was recently awarded the Editor's Choice Award from R&D Magazine as the most technologically significant product of 2004.

The system is intended to be set up in the middle of a public place like a shopping mall, individual retail store, or a trade show, where customers can step in and out of the unit, receive their printed information, and continue shopping. Its external design expresses this function of the system at the best.

The scanning process works in the following way: a person steps inside the Intellifit cabin without undressing, the "L" shaped millimeter-waves transceiver swings around and over the person to acquire the required data. The entire scanning process lasts about 10 seconds. The collected data consists of about 200,000 points in space, representing the surface of the human body. Out of the measurements, automatic algorithms determine about 200 characteristic body sizes of the human body, such as the waist size, with an accuracy of about 6 mm.




*Scanning process and print-out with body measurements*

The U.S. marketing strategy of Intellifit Corporation plays on the familiar sentiments of frustrated shoppers that have to try (and take off) a large amount of clothes to find the item which fit them correctly. Indeed, poor fit is the first reason for returns and the second complaint among U.S. shoppers, whether they shop online or in a store. Intellifit system could solve these problems by giving the correct fit size to the customer.

Quite every descriptions about Intellifit system appeared in the press are positive and no problems or criticisms are raised. However, I think open questions are still present. I will express them shortly in the following lines.

*continues at page 2*

# Technology

## Intellifit revolutionary full body scanner

### Millimeter-waves based technology allows 3D scanning without undressing

*by Nicola D'Apuzzo,*
*Homometrica Consulting, Zurich, Switzerland*

*continues from page 1*

My first concern is about the accuracy of the body size measurements performed by Intellifit System. For a "best fit" solution it is in fact of extreme importance the precision of the extracted measurements. To step inside a full body scanner is always an event and provokes entertainment to the customer. However, if the extracted body measurement are not as precise as the classical tape measurement, then customers will not enter any more in the scanning cabin.
Technical reviews say that Intellifit system can achieve an accuracy of about 5-6 mm. This achievement seems to me optimistic. In fact, the 10 seconds scanning time is quite long considering the circular movement of the transceiver. It is barely difficult for a person to stay immobile in a standing position during this period. Other full body scanning systems available in the market try to solve the problems caused by the person moving during the process. Scanning systems based on white light projection, try to reduce the scanning time to a minimum in the range of few 2-4 seconds and laser scanning systems compensate the pendulous movement of the persons by digitizing them from top to bottom. The accuracy achieved by other full body scanners are without any doubts better then the results of Intellifit System.
The second concern I would like to raise is the reaction of customer to the active scanning process. Even though the millimeter-wave radiation is nonharmful, complaints and concerns can be expected. The problems raised by the radiation generated by mobile phones can be taken as example. Already laser scanning systems are seen by customers with a little concern and I can imagine that to be "radiated", even with nonharmful millimeter-waves, will not be easily accepted by everybody.
Even though, these concerns, I believe Intellifit System contributes to a great advance in technology allowing the 3D scan of a person without undressing.
Indeed, it is very interesting to survey how the market will react to this new competitor in the field of full body scanning. It is for sure to take in consideration and keep an eye on the future development of the used technology.

*Sources:*
*Intellifit Corporation, Horsham (PA), USA, www.intellifit.com*
*Pacifit Northwest National Laboratory, Richland (WA), USA*
*TechCommJournal, Dec 2004/Jan 2005*

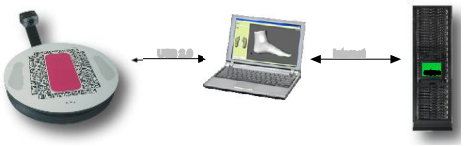


## corpus.e lightbeam®

### Mobile, accurate and affordable 3D foot scanner

*by Dirk Rutschmann,*
*corpus.e AG, Stuttgart, Germany*

The traditional way of selecting shoes in retail stores is based on one-dimensional measures: foot length, foot width, perimeters etc. These rather crude 1-dimensional measurements, manually taken from a 3-dimensional body, allow only for a very broad selection of a fitting shoe. The best fit must still be found by trial and error, i.e. by trying on a substantial number of different shoe sizes and styles from a necessary large collection hold in stock at the retailer. This 'customization' process in buying shoes is time consuming for the customer, requires an expensive stock and personal from the shoe retailer and still more then often leads to a non satisfying result.
On the other hand there is a vast number of sophisticated 3D laser- and fringe projection based foot scanners on the market which are able to scan the correct 3D shape of a foot. Mass-customization and best-fit selection using these scanners have nevertheless not been successful up to now for a major reason: the costs of the required investments are just too high for a normal shoe shop.
The lightbeam 3D foot scanner is built to dramatically reduce the costs in using such a 3D foot scanner. It is based on our *MagicalSkin* technology widely used for orthopedic and medical applications. Up to March 2005 approximatively 140 shops are using these kinds of affordable scanners.
We have shifted hardware to software components and have centralized these expensive components for all users on an Internet server for an overall much more economic approach. In this way, the shop requires just a small platform which is equipped with one digital video camera.



*The affordable and mobile lightbeam® 3D footscanner*

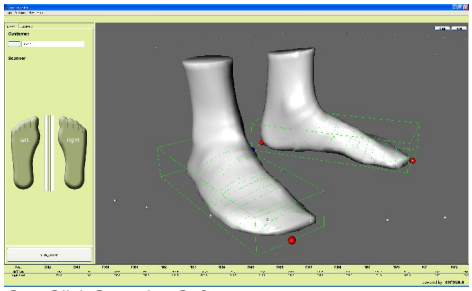
A 3D foot scan is as easy as the following steps:

***Preparation***
The body part to be digitized is covered with a low-cost elastic garment, the "Magical Skin". The "Magical Skin" bears special color and b/w photogrammetric marks.

***Acquisition***
The customer has to step, wearing the MagicalSkins, on the scanners platform. By using the One-Click lightbeam Software, the feet are digitized one after the other taking approximately 25 seconds per foot.

***Processing***
The captured information is sent in the background to the high performance server to process the 3D models and measurements of the individual foot. In the moment when the second foot is captured the results of the first foot are received and shown in the software. The transmitted data has a size of 200-300 KB per foot.
The centralization of the expensive parts of the scanner makes the whole technology affordable for every user by avoiding spare time of these components on every instance.

***Application***
The 3D data set can now be post processed according to the application, exported into standard file-formats, like DXF, VRML etc. Depending on the application for which the data set is used, it is also possible to fully automatically read out specific parameters or measures like for example size, length, height or circumferences. The accuracy is 1 mm.



*One-Click Scanning Software*

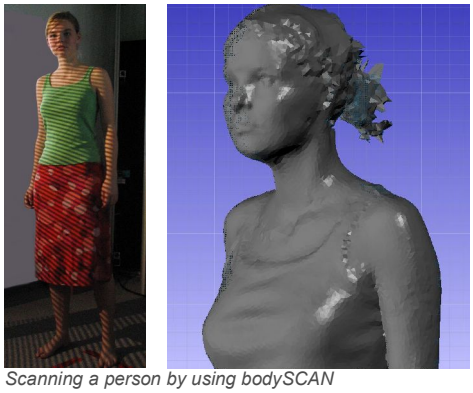
*Additional information about corpus.e and its products can be found at the web address: www.corpus-e.com*

# Technology

## The new Breuckmann body*SCAN*

### Fast, accurate and flexible 3D full body scanning system

*by Heike Ehrhardt and Hans Woerner, Breuckmann GmbH, Meersburg, Germany*



*Scanning a person by using bodySCAN*

Breuckmann has been developing its wide range of scanning systems since 1984. Since that time, the company has developed a pretty extensive range of products, all based on the same core technology that moves from mainstream reverse engineering and inspection, through facial scanning and into medical areas for dental and dermatology purposes.

All of the products rely on a technology called Miniaturised Projection Technology (MPT), itself based on structured white light scanning. This patented MPT device projects a moiré fringe pattern on the object being scanned. This is then captured using the camera unit. As the two devices are separated horizontally at a known distance (referred to as the sensor base), the OPTOCAT software can perform triangulation calculation to measure the position of each point within the fringe pattern. Because of the way the system works, it can scan millions of points within a few seconds.

The body*SCAN* system is the consequential enhancements of the in-vivo metrology series. Based on the long lasting experience of in the area of skin and face measurements, Breuckmann developed a system for the fast digitization of the whole human body.

The interaction between the patented projection technology and an especially designed control unit enables the system to finish the whole scan procedure in less than 2.5 seconds – so the body*SCAN* system is the fastest scanning system of all systems with resolution less than 0.5 mm. In this way the test person can be scanned in a natural and relaxed posture.

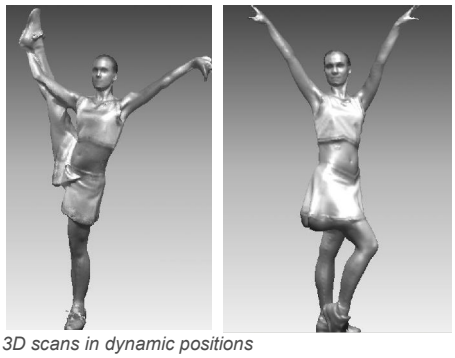
*Scanning two persons in a natural pose*

The body*SCAN* sensor system consists of four measurement pillars, each equipped with a projector and two digital cameras. Features which should be particularly stressed are the flexible construction and no necessity of a special scan cabin. The system works at subdued light and can be built up in a very short time. The eight datasets which are captured within each scan, are processed and finally combined with the powerful OPTOCAT software. The software offers an easy-to-use graphical user interface.

*Breuckmann bodySCAN*

The ability to capture the complete geometry of the body, even in dynamic positions, creates manifold possibilities of using the data:

- Tailor-made clothes for extreme sports
- Computer animation and computer games
- Gifts and souvenirs, such as sculptures or sub-surface engraving
- Medical technology and prosthetics
- Individually fitted seats, in car manufacturing and aircraft construction
- Fashion and design, mass customization



*3D scans in dynamic positions*

*Additional information about Breuckmann and its products can be found at the web address: www.breuckmann.com*

# Research and Consulting

## ISPRS Working Group on Medical Image Analysis, Human Motion and Body Measurement

### Successful first meeting in Zurich of the newly formed working group

*extracted from the publication written by Nicola D'Apuzzo, Homometrica Consulting, Zurich, Switzerland Petros Patias, The Aristotle University, Thessaloniki, Greece*

The first meeting of the newly formed working group was held in Zurich on February 21st 2005. At the beginning of the meeting, Petros Patias introduced the goals of the working group and listed the aims of the first meeting of the working group in five important points: (i) get to know each other, (ii) review the working group terms of reference, (iii) select focal points, (iv) set strategic targets and (v) set actions plans.

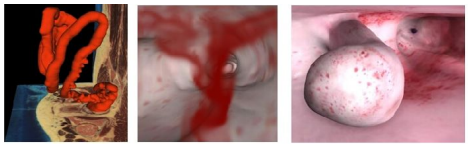
Petros Patias, chair of the Working Group V/6 and former chair of the Commission V, has done some work about medical image analysis during his career, however his great contribution to the working group is his deep knowledge of the structures and organization of ISPRS (International Society of Photogrammetry and Remote Sensing, www.isprs.org).

After the introduction, all the board members present at the meeting shortly introduced themselves.

Nicola D'Apuzzo has a background of mechanical engineering with focus on biomedical applications. Moreover he received his Ph.D. in the topic of human body measurement and tracking from video images. Currently he directs in Zurich a consulting firm in the field of human body measurements. His main activities regard 3D human body scanning for various applications in medicine and fashion/beauty.

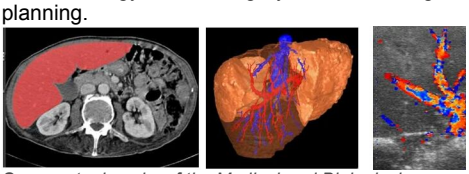
*Some of the consulting activities of Nicola D'Apuzzo*

Gábor Székely currently directs the Medical Image Analysis and Visualization group of the Computer Vision Laboratory of ETH Zurich. The main research topics of the group are: computer aided surgical navigation, segmentation of medical images, visualization of medical data, image registration from different sources (e.g. CT, NMR, PET, surface), quantitative X-ray analysis and surgical simulation.



*Some actual works of the medical imaging group directed by Gábor Székely*

Hans-Peter Meinzer is director of the division Medical and Biological Informatics of the German Cancer Research Center in Heidelberg. He has a rich background on bioinformatics and medical imaging. The current main research activities of his group are: segmentation of medical images (CT, NRM, echography) for diagnosis and therapy support, augmented reality and navigation in computer aided surgical intervention, 3D echography, and 3D simulation of cell migrations. The current main applications are cardiology, heart surgery and liver surgical planning.



*Some actual works of the Medical and Biological Informatics group directed by Hans-Peter Meinzer*

*continues at page 4*

# Research and Consulting

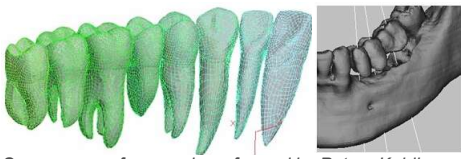
## ISPRS Working Group on Medical Image Analysis, Human Motion and Body Measurement

### Successful first meeting in Zurich of the newly formed working group

*extracted from the publication written by*
*Nicola D'Apuzzo,*
*Homometrica Consulting, Zurich, Switzerland*
*Petros Patias,*
*The Aristotle University, Thessaloniki, Greece*

*continues from page 3*

Petros Koidis is professor at the Department of Fixed Prosthesis and Implants Prosthodontics of the Dental School of the Aristotle University of Thessaloniki in Greece. His current activities imply mouth rehabilitation and biomaterials for medical and dental applications. The main topics of his actual research are focused on: dental and implant treatment planning and therapeutics, modification of existing materials, development of new materials corresponding to biological structures, biomimetics and tissue engineering.



*Some areas of research performed by Petros Koidis*

Important decisions about the activities of the working group were taken during the meeting. It was decided to submit proposal for joined projects within the working group at EU 7th Framework Program.
It was also discussed about the organization of a workshop in November 2005, focused on 4D (4 dimensions) or 3D+T (3 dimensions + time). The topic would be very interesting and attractive. It includes several research and application areas, such as movement analysis and joint kinematics, navigation in computer aided surgical interventions, dynamic 3D surface measurement, long time shape tracking. It was decided to invite clinicians to the workshop. In this way, the workshop could represent a first attend to establish a platform to connect photogrammetry, medical imaging and medicine.
Patias proposed Agios Nikolaos, a picturesque small town in Crete, Greece as place where the workshop should be held.
The working group will participate actively at conferences related to medical imaging, by organizing technical sessions and/or tutorials: SPIE Medical Imaging 2006, MICCAI 2005 (Medical Image Computing and Computer Assisted Intervention), CARS 2006 (Computer Assisted Radiology and Surgery), CAOS 2006 (Computer Assisted Orthopaedic Surgery), 9th Symposium on 3D Analysis of Human Movement 2006, ISPRS Comm. V Symposium 2006.
All the participants of the working group meeting were satisfied with the results achieved. The meeting was closed with a glass of wine.
All readers, working in the fields of the working group, are invited to join and become active members.

*More information about the working group, as well as the original report, are available at the homepage of the working group: www.commission5.isprs.org/wg6.*

## Dynamic surface measurement

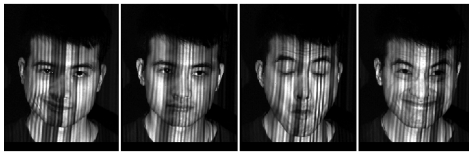
### Actual stand of research at the University of Washington

*extracted from publications written by*
*Li Zhang,*
*University of Washington, Seattle (WA), USA*

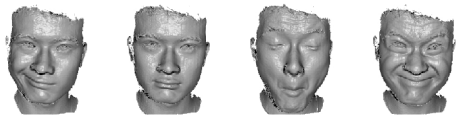
Creating face models that look and move realistically is an important problem in computer graphics. It is also one of the most difficult, as even the most minute changes in facial expression can reveal complex moods and emotions. Yet, the presence of very convincing synthetic characters in recent films makes a strong case that these difficulties can be overcome with the aid of highly skilled animators. Because of the sheer amount of work required to create such models, however, there is a clear need for more automated techniques.
Modeling facial dynamics is essential for creating animations, but it is more difficult to achieve due in part to limitations in current shape capture technology. In particular, laser-scanners and most other high-resolution shape capture techniques do not operate effectively on fast moving scenes (a transition to a smile can occur in a fraction of a second). Furthermore, the problem of creating animation tools that exploit captured models of 3D facial dynamics has yet to be explored.
We present a novel, end-to-end system for producing a sequence of high-resolution, time-varying face models using off-the-shelf hardware.
Our system takes as input 6 synchronized video streams (4 monochrome and 2 color) running at 60 frames-per-second (fps), and outputs a 20 fps sequence of high-resolution 3D meshes that capture face geometry, color, and motion. The videos are recorded by a camera rig shown in the figure.


*Face capture system: six cameras and two projectors*

Three of the cameras capture the left side of the face, and the other three capture the right side. To facilitate depth computation, we use two video projectors that project gray-scale random stripe patterns onto the face. The projectors send a "blank" pattern every three frames, which is used to compute both color texture maps and time correspondence information (optical flow).
The vast majority of stereo research has focused on the problem of establishing spatial correspondences between pixels in a single pair of images for a static moment in time. The appearance of the real world varies over time, due to lighting changes, motion, and changes in shading or texture over time. Traditional stereo algorithms handle these variations by treating each time instant in isolation. Better results may be obtained by considering how each pixel varies over time and using this variation as a cue for correspondence an approach we call *spacetime stereo*.
The basic principle of spacetime stereo is straightforward. First, consider conventional stereo algorithms, which generally represent correspondence in terms of disparity between a pixel in one image and the corresponding pixel in another image.
The matching function used to compute disparities typically compares spatial neighborhoods around candidate pairs of pixels. Spacetime stereo simply adds a temporal dimension to the neighborhoods used in the matching function. The spacetime window can be a rectangular 3D volume of pixels, which is useful for reconstructing scenes in which changes in lighting and appearance, rather than shape changes, dominate. When the object is moving significantly, the disparity must be treated in a time-dependent fashion. In this case, we compute matches based on oriented spacetime windows that allow the matching pixels to shift linearly over time.
The spacetime stereo approach has several advantages. It serves as a simple yet general framework for computing shape when only appearance or lighting changes. For objects in motion, possibly deforming, the oriented spacetime window matching provides a way to compute accurate disparity maps when standard stereo methods fail. This last case is shown to be particularly effective for structured light scanning of moving scenes. The next figures show an example of the results achieved by acquiring dynamically the shape of the face of a person changing expression.



*Some frames of acquired image sequences*



*Measured 3D surface of the human face*

*Additional information about the work described here, as well as, the original publications can be found at the web address: www.cs.washington.edu/homes/lizhang.*

# Research and Consulting

## Homometrica Consulting

### Interdependent consulting firm in the field of human body measurements

*by Nicola D'Apuzzo,*
*Homometrica Consulting, Zurich, Switzerland*

Homometrica Consulting was founded on April 2004 by Dr. Nicola D'Apuzzo in Zurich, Switzerland. It is an independent consulting firm based on over eight years experience of Nicola D'Apuzzo in the fields of human body measurements, surface digitization and 3D scanning. Technical consulting is the company's main activity. It provides advice on wide ranging issues in the field of human body measurement associated with equipment purchase, product development and research.
Our consulting services include:
- project managing,
- products evaluation,
- report and presentation editing,
- market and research surveying.

Some examples of services offered by Homometrica Consulting are presented here.

**DEVELOPMENT**: You want to develop a 3D human body measurement system (hardware or software).
We know the different methods and technologies for the measurement of the human body (e.g. face, hands, back) in any condition (e.g. fixed or in movement). Based on our experience in the field, we help you planning the development of your system.
You get the directions for the development of your system. You save time by avoiding studying deeply all the different technologies.

**INTEGRATION**: You want to develop a 3D human body measurement solution based on existing products (hardware and software).
We know the different products existing for the measurement of the human body. Based on our experience in the field, we find the correct technologies fulfilling your requirements and we help you integrating them into your solution.
You get the adequate elements to be integrated into your solution. You save time by avoiding searching and evaluating different systems.

**MARKETING**: You want to sell your 3D human body measurement system/solution.
We know the different products and solutions existing for the measurement of the human body. We help you planning the marketing of your system/solution.
You get the target area for your system. You save time by avoiding studying the different solutions present in the market.

**PURCHASE**: You want to buy/use a 3D human body measurement system.
Based on our experience in the field of human body measurement, we know the correct method for your application and we find the best system fulfilling your requirements.
You save time by avoiding searching and evaluating different systems. You save money by selecting the correct and the less expensive technology for your application.

**INFORMATION**: You want to learn about 3D human body measurements.
We teach you the different methods and technologies used to measure the human body.
You learn the specific know-how. You save time by avoiding learning the entire technology background.

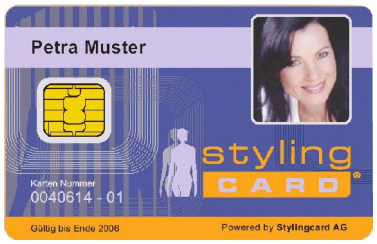
*Additional information about Homometrica Consulting can be found at the web address: www.homometrica.ch.*

# Applications

## Stylingcard – A platform for good looking and well being

### Swiss project uses scanning technology for fashion and beauty applications

*by Hans Flury, HF Consultants GmbH,*
*Wangen bei Olten, Switzerland*



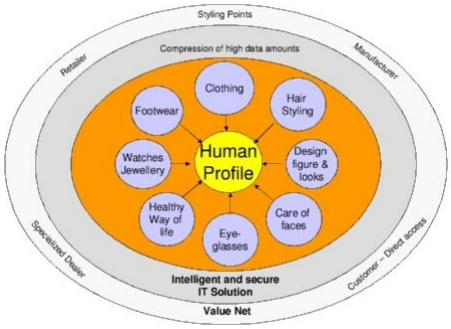

**Individuality becomes standard wit a new "platform for good looking and well being"**

**Stylingcard** offers a universal storage medium allowing to match personal desire and industrial offerings. A large amount of personal data, including 3D body shape, body sizes and personal wishes are stored and available to participating retailers.
Based on the stylingcard principle, the customer can match his personal requirements with most of the products on the market. The new principle allows, as a logical consequence of the new economy, the following change in attitude: The product chooses the customer! Thus implying that successful manufacturers and retailers are enforced to have always actual and updated customer's data. Stylingcard make this available without high investments.

**Focus on individuality:** Most companies focus today on customer's behavior and data, implementing customer cards, performing market analysis or surveying customer's satisfaction.
Stylingcard removes the uncertainty of guessing customer's wishing and tailoring of innumerable products to best fit the demand. All services can be sold with high competitive prices and high customer satisfaction, the market's data is managed efficiently.

**The virtual twin:** Key for your success. The principle stylingcard is based on collection and presentation of a detailed personal profile. The personal profile is a combination of a high quality 3-D scanning data and a structured analysis of personal requirements and wishes. The entire data constitutes the "virtual twin". The principle guarantees complete protection of privacy and personal data. Each customer is owner of his own data, and can periodically update its profile. The virtual twin can be used easily in different applications.

**An intelligent solution:** The regional consulting center Styling Point. The Styling Point is the communication platform in the concept. In a Styling Point, the customer obtains all the required personal data (3D scanning and personal profile) and is offered style consulting from specialists of different branches. Personal one-to-one consulting, as well as online access to the entire stylingcard network are provided at the styling point. At a Styling Point, mass customization becomes reality.
The "Gene code" makes it work: 30 to 100 MB data need to be stored for each customer. The new technology of semantic system is a core element of the stylingcard principle. It makes new compression dimensions available to everybody on an individual stylingcard. The large amount of data are stored and encoded in a neuronal network. From this, a "Gene code" is extracted. The original data can be reconstructed, e.g. through a handshake, on a standard viewer. Alternatively the "Gene code" can reproduce all the time the initial data.
The value net connects customers, retailers and manufacturers. Stylingcard is a platform offering great benefits for everybody. Customers have a never-seen-before variety of products available. They can choose, based on their own profiles, clothes, shoes, jewelery, eye-glasses and much more in a transparent way. Retailers have the possibility to offer a much larger range of products and services, without high investments. Manufacturers receive electronic readable orders, based on 100% transparent data and ready for direct manufacture.




*The value net of Stylingcard®*

Stylingcard is flexible and can be used from home through Internet, in the styling point or in a retail shop. Stylingcard will improve the customer advisory service and the value chain of the stylingcard partner. Stylingcard partner take profit from the closer match of demand and supply with e.g. lower logistic cost, lower capital requirements and write off rates. These are the elements to have a fast return of investment (ROI) for the stylingcard partner and provide the basis for a successful business.

**Stylingcard is based on serious research:** The joint venture of science and representatives of different markets is developing the presented solution for good looking and well being since more than two years. The company founded 2003 in Zurich will provide the possibility to buy individual and cost-efficient products, based on professional style consulting.

**The market is ready for new solutions:** It is an accepted opinion that the consumer market is shrinking or saturate. Customers have money, but they hesitate to buy new products. Low cost products of global players are sold everywhere at very low prices. This battle ruins more and more European companies. An opposite trend shows economic growth on the home market. The demands for personalized products with prices comparable to mass production merchandise is steadily growing.

*continues at page 6*

# Applications

## Stylingcard – A platform for good looking and well being

### Swiss project uses scanning technology for fashion and beauty applications

*by Hans Flury, HF Consultants GmbH, Wangen bei Olten, Switzerland*

*continues from page 5*

Consumers want to become co-designers and identify with their products. They don't want to buy clothes or shoes, they want to buy best-fitting clothes and most comfortable shoes.
Big industry and trading companies as well as many start-ups are following this trend. They want to find solutions for the individual requirements of their customers. The strategy of mass customization needs new methods in communication, marketing and manufacturing processes. Complete solutions, which can be easily integrated into existing environments, are required. Stylingcard is such a solution!

**The Stylingcard project starts NOW:** The Stylingcard AG in Switzerland is actually collecting with mobile and stationary styling points individual customer data of more than 100'000 people (average 5% of the market potential in Switzerland). A 3-D body scanner is the base for the virtual twin. The first collection of data is offered at no cost to the customer. A fee will be eventually introduced in the second year of use. Partial sponsoring by partners is anticipated.
The different industries can be part of the stylingcard principle. Their participation is based on a developed questionnaire. The expectations of customers, retailers and manufacturers are high. There is a high potential of cost savings and a reduction of the risk associated with the introduction of a new product.

**More Information about "Stylingcard":** If you would like to have more information about the business model, the next steps and the market penetration with Styling Points, don't hesitate to contact us or have a look at www.stylingcard-ag.com.

**EVENTS**

**3D MODELLING 2005**
PARIS, FRANCE, September 27-28

3 conferences and 1 exposition in the same place

**NUM 3D**
3D SOLID DIGITIZING & IMAGE PROCESSING

**3D HUMAN**
3D HUMAN DIGITIZING & MODELING

**3D MEDICAL**
MEDICAL SCANNING, MODELING & IMAGING

Information at www.numerisation3d.com

## Grand Odyssey

### The film where spectators star in

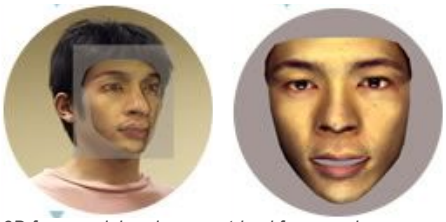
*by Nicola D'Apuzzo, Homometrica Consulting, Zurich, Switzerland*

The Exposition 2005 in Aichi Japan is full of new technological innovations. A world-fisrt in entertainment is shown at the Mitsui-Toshiba Pavillon: *GRAND ODYSSEY*, a unique computer animated film.
Spectators queueing outside what appears to be an ordinary cinema, are invited to place their faces into a hole in the wall for a few seconds. High-resolution digital cameras perform a quick scan from several angles, and everyone takes their seats. The animated film begins as normal, but the cast is made up of walking, talking digital replicas of people in the audience.

Each spectator gets a role (there are soldiers, doctors, scientists and politicians involved in the story) as a Toshiba supercomputer is processing the one-time-only film.
The *Futurecast System* was initially developed by Waseda University Professor Shigeo Morishima, and Mistui-Toshiba engineers completed it after amassing a great deal of know-how and technology.
The process can be described as follows.
(1) A simple face scanner capture images from the person from different directions.

*Spectator original face, face scanner*

(2) A 3D computer model of the person's face is automatically generated from the scanning data.
(3) Out of the 3D face model a parametrized face mask is automatically extracted. The parametrization allows to index face features as eyes, eyebrows, nose, mouth, etc.



*3D face model and parametrized face mask*

(4) The face mask can then be directly inserted and animated in the movie.

*Person's face inserted and animated in the movie*

*More information about GRAND ODYSSEY can be found at the web address: www.mt-expo.com/odyssey*

## Colored figurines from Japan

### MIC turns 3D bodyscans into figurines

*by Nicola D'Apuzzo, Homometrica Consulting, Zurich, Switzerland*

*Sources:*
*Gareth Edwards, engadget, www.engadget.com*
*TV Tokyo Corporation, www.tv-tokyo.co.jp*

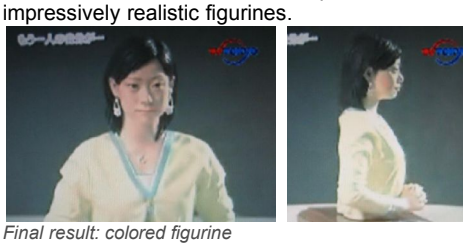
The Japanese company MIC applies the well known rapid prototyping technologies of 3D scanning and 3D printing in the production of figurines that represent accurate replicas of real persons.
3D body scanning (KonikaMinolta VIVID910) is used to acquire the shape as well as the texture of a person. A precise 3D computer model of the face and bust of the scanned person is edited accurately on computer by using modeling software (SensAble FreeForm).

*3D scanning of the person, results of the scanning, and 3D colored surface model*

The prepared 3D data is sent to milling or 3D printing machines to result in a precise plastic replica of the scanned person.

*3D milling and resulted plastic model of the person*

The new and important achievement of MIC is the automated coloring process of the plastic model. This allows the production of impressively realistic figurines.



*Final result: colored figurine*