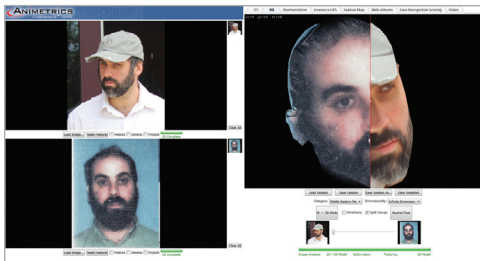
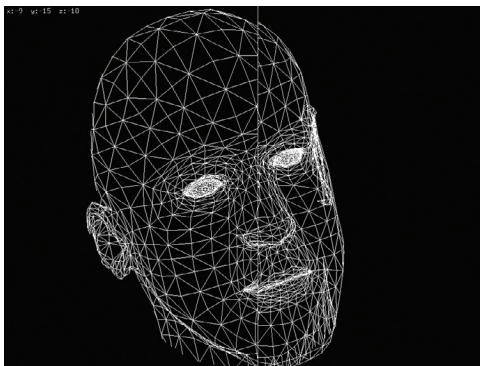


FORENSICA GPS™

Advanced 2D to 3D image transformation and analysis means more precise and accurate facial recognition



ForensicaGPS enhancing visualization with 3D viewing using facial split window feature at any pose (x,y,z)



ForensicaGPS 3D mesh exposed showing accuracy in facial geometry

In law enforcement, forensic investigative operations and other security environments there is a crucial need to compare multiple facial images to determine if the images are of the same or different individuals. For fast and accurate digital facial comparison and recognition, professionals use ForensicaGPS.

ForensicaGPS is the most effective digital tool on the market, providing timely, accurate and analytical comparisons of multiple facial images, while also offering assistance in working with victims by producing 3D images of suspects that can be used for visual comparisons.

ForensicaGPS is a unique facial creation and image quality enhancement tool designed to make photos and video frames of a person's face "ID ready" for visual identification or for inclusion within Animetrics FaceR Identity Management Systems (FIMS) or in a third-party face recognition system.

Designed for integration into military, intelligence, homeland security and law enforcement facial identity applications, ForensicaGPS can be easily adapted utilizing its powerful graphical user interface and various facial feature comparator tools and modes.

The application utilizes a global coordinate system (x,y to x,y,z synchronization) for precise comparative analysis of facial features including scars, moles, tattoos, and distance measurements between facial features. The application provides controls that allow metric analysis with face similarity scoring, as well as 2D or 3D visualization of facial structure, geometry and texture. Up to five images of each subject can be compared to the other subject facial images.

Utilizing two subjects, two 3D models are created, allowing both visual and metrical comparisons. ForensicaGPS also allows for the mapping of 2D coordinates to 3D coordinates in context, meaning the final 3D image can be viewed at any angle, making it a complete 2D to 3D comparison solution.

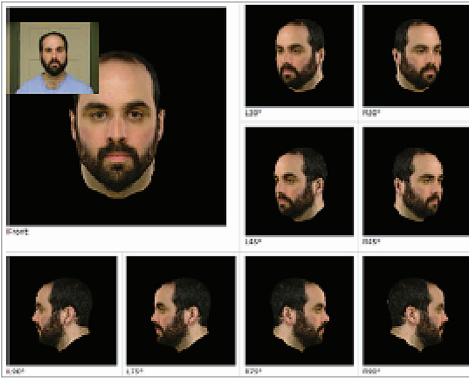
Any 3D model created in the system can be also be manipulated for accurate comparisons. The image can be rotated in any plane or used to create a wireframe image and overlaid on a second image for comparison.

Multi-dimensional Transformation

The key to ForensicaGPS' accuracy is the ability to convert two-dimensional data into a three-dimensional avatar which can be rotated and viewed from any angle. To achieve a highly-accurate 3D rendering, ForensicaGPS employs Animetrics' powerful and patented FaceR™ software, which employs highly sophisticated mathematical algorithms and applies a unique deformation smoothing process to a 2D facial image and transforms it into a metrically precise, accurate and fully structured 3D avatar.

Analyze and Recognize

ForensicaGPS leverages its proprietary Anatomic Diffeomorphic Mapping™ for identification, zooming in and closely analyzing the likeness and similarities in one or two facial images in both 2D mode and 3D mode, as well as both metrically and visually. By using the built-in global coordinate system for comparing up to five avatars at once, the ForensicaGPS comparative analysis can accurately replicate standard facial features and unique anomalies. The resulting avatar can be viewed from any angle and compared



Sample ForensicaGPS gallery output.

to other 2D or 3D images. By producing the mapped features in a 3D model, ForensicaGPS also allows recording of facial features metadata such that all two dimensional x and y coordinates are mapped perfectly to their corresponding three dimensional x, y and z coordinates.

ForensicaGPS comes in two versions:

ForensicaGPS Workstation — one or two photo comparison and analysis program for forensic facial study that runs on a Windows -based PC or workstation computer.

ForensicaGPS ActiveX Controls — for embedding ForensicaGPS into Windows-based applications or within Internet Explorer browsers. All ForensicaGPS controls and GUIs available as separate ActiveX control windows.

Animetrics FaceR™ Technology

Animetrics' FaceR technology is the engine behind all of Animetrics' facial recognition and face creation systems. FaceR is an integrated facial recognition technology that is designed to render accurate and useful 3D avatars from 2D images and video, even if the 2D image is not "straight on." The FaceR 3D model is generated through a combination of an *a priori* mathematical model of faces, advanced image analysis and feature extraction, and advanced techniques for deriving precise pose (or rotation) estimates from an input image.

FaceR technology can be tightly integrated into third party applications using the FaceR Facengine SDK.

Technical Specs

FEATURES

- Accepts facial poses of +/- 30 degrees (frontal) and +/- 70-90 degrees (profile).
- Smart Texturing – fills occluded facets.
- Automatic feature detection for images at any y axis pose between -90° and +90° and also pose angles in x and z axis.
- Integration of up to 5 images per subject.
- 2D comparison by deforming / overlaying images with a transparency filter.
- 3D geometric comparison via the generation of 3D models from 2D images.
- Nominalization of lighting fields to eliminate shadows in source imagery.
- Animetrics FaceR™ technology provides a verification score.
- Single-subject mode for generating a 3D model for a single individual.
- SDK and ActiveX Control available to streamline system integration.
- Automatic or manual landmark input. ForensicaGPS is primarily designed to operate as an interactive application with the user carefully placing descriptors on features of the face. However, ForensicaGPS can also take advantage of Animetrics' unparalleled facial analysis to automatically place descriptors to enhance efficiency.
- ForensicaGPS allows the manipulation of models for examination prior to exporting an image sequence or video file.
- From the two subjects, two 3D models or avatars are created which can both be visually and metrically compared to each other.

- Provides a Split Viewport function on the 3D avatar using a window shade effect to pull down or slide across the 3D face at any angle in any direction, allowing for comparisons of specific facial features.
- Uses a built-in global coordinate system (x,y to x,y,z synchronization) for accurate comparative analysis of facial features such as scars, moles, tattoos and distance measurement between selected facial features.
- Able to map 2D coordinates to 3D coordinates at any angle and compare one image or 3D to another image and 3D.
- ForensicaGPS also allows recording of facial features' digital metadata.
- Multiple Rendering Options:
 - Surface Illumination: Adds a lighting effect to the surface of the avatar.
 - Wireframe: Shows the underlying wireframe supporting the avatar.
 - Mask: Displays only the frontal region, or "mask," of the face.
 - Show Features: Displays all visible features defined on the avatar as color-coded points.
 - Show Entire Head: When more than one view is used, this option becomes activated. It will display a full avatar.
- GalleryGen function: Allows the output of a sequence of images of any pose desired for preparation of artistic materials or scientific testing.
- Model Tuning: Allows the parameterization of model generation based on ethnicity, age, or ethnic group providing optimized and more realistic output.
- AVI Gen: Allows the generation of an AVI video sequence of an animated head.

OUTPUT CAPABILITIES:

- ForensicaGPS supports output to JPEG images files and ForensicaGPS supports the generation of AVI video files. Any DirectShow video filters present on the host machine can be used to encode the output video.
- Output Formats: GTI (native format), DXF, IGS, OBJ, PLY, PNT, STL, and VRML

INPUT REQUIREMENTS:

- JPEG or PNG images are supported
- There is no inherent limitation on image resolution. However, ForensicaGPS will not perform resolution enhancement. The quality of the texture maps applied to the model will be consistent with the quality of input images. One megapixel or larger images are recommended.

System Requirements

SOFTWARE & HARDWARE REQUIREMENTS:

- 1.8GHZ or faster processor
- Microsoft® Windows® XP/Vista/7 (32-bit and 64-bit versions supported)
- 512MB of RAM (1 GB recommended)
- Graphics support for OpenGL 3.0
- 1,024x768 display (or larger)



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