

Facial Recognition Software [FRS]: Family History's Latest Tech-Tool

In addition to the development of commercial databases into programs such as My Heritage Maker, Family Tree Maker, Genealogy and many more like them the world of research has expanded at an unprecedented exponential rate with the use of special websites on the internet, email, Optical Character Recognition [OCR], spreadsheets and e-publication. With these developments comes the never ending obligation to check and re-check data/information. One such facet of family history that causes many hours of concern is the many old, unlabelled, family photographs and whether someone resembles some relative or other.

Over relatively recent years computer technology is being developed that may assist this quest for solving the problem of recognising past relatives - Facial Recognition Software [FRS]. Once the stuff of Spooks and security services FRS is now in everyday use including the family digital camera. Knowing that for some family historians' computer technology has been a challenge while others have used it with great skill and with immense satisfaction; FRS will appeal to the technologically inclined while those finding such technology confronting have the opportunity to seek assistance from commercial organisations.

Our faces have numerous, distinguishable landmarks – in layman terms there are many different peaks and valleys that make us who we are – the ‘facial features’. An example of these ‘nodal points’, to apply the technical term, is illustrated in the opposite diagram sourced from the Dynamic Ventures website.¹ Most software, [e.g. FaceIt] defines each human face into approximately 80 nodal points, including:

- Distance between the eyes
- Size and depth of the eye sockets
- Width of the nose
- The shape of the cheekbones
- The length of the jaw line



From these nodal points data is created a ‘faceprint’, representing a holistic numerical code in the database.

Currently there are two main types of FRS the two dimensional [2D] and the multidimensional [MD]. The very much cheaper 2D software relies on a particular image being compared to other 2D images contained on a database. This method has the distinct disadvantage that to be effective

¹ <http://imagegraphicsvideo.com/ms/001/ObjectRecognition.html?>

[i.e. accurate] the image of interest needs to be front on – that is looking directly into the camera. More over, to achieve accurate measurement there must be little variance in photographic light quality [gamma for the technocrats] or facial expression compared to those images on the database. These technical conditions prevent the use of most historical photographs.

In most instances the images were not taken in a controlled environment. Even the smallest changes in light or orientation could reduce the effectiveness of the system, so they couldn't be matched to any face in the database, leading to a high rate of failure. To correct the problems presented by 2D systems, multi-dimensional facial recognition techniques [MDFR] have been developed which go some way to correcting gamma, focal length and subject angle problems.

While the MDFR is developing quickly there are quite distinct levels of sophistication and implementation. At the high-end of the spectrum are companies such as Dynamic Ventures who specialize in developing software for technology companies who incorporate MDFR in their product and marketed under their company or brand name. One such application of this complex technology is in many of the latest family digital cameras, originally pioneered by the Canon Corporation. These MDFR digital cameras identify faces and automatically adjust the exposure[s], focus and in some instances, the focal length perspective to provide the best representation of the face.

At the lower-end is Photo©Identix Inc. has produced personal computer software, FaceIt® and MyHeritage website², both of which compare the faceprint with other images in the database.³ Further, FaceIt is designed to pick a face out in a crowd, extract the face from the rest of the scene and compare it to a database of stored images. Google⁴ is using similar technology in its Neven Vision variation 'Picasa Package' released in late 2008⁵. Google presents Picasa as a photo management and sharing system where users tag their photos, and the software searches through pictures to find the same people and place tags.

For the family historian it is now [theoretically] possible to identify a person in a photograph, upload the image using a Picasa account and then use it to match with other photographs. Another associated product, Flickr, it is easy to transfer files containing 'comparable' images. While law enforcement agencies use these techniques with procedural restrictions⁶ there are

² <http://celebrity.myheritage.com/celebrity-face-recognition>

³ -Identix®, a Minnesota based company and one of many developers of FRS technology.

⁴ See also: 'Facial Recognition Software for Everyone', on Omar Ha-Redeye's website, October 5th, 2008.

⁵ Currently restricted to residents of the United States of America.

⁶ For example the Passport Canada's Facial Recognition Project; Australia is also developing these capabilities.

broader concerns relating to personal privacy⁷, there are other issues such as photographs of protests, rallies, or public meetings being uploaded, scanned and persons identifies within the crowd.

Currently [2009] the software is still error prone and still works best when the target is facing the camera – the 2D restrictions. However with the proliferation of mobile-phone and MDFS cameras acquiring appropriate photographs is the least of the family historian's challenges.

MDFS has the potential of being a new and useful tool for the family historian as its makes tagging and organising photos much easier and may solve a family riddle or two. However, there are important privacy issues including for persons who have been unknowingly adopted and then recognised as part of another family. Additionally, there is a vast amount of incorrect information on family/genealogy websites, and will this new technology exacerbate this problem?

Being involved in the application of computers to research projects for more than 45 years there is a recognition that all new developments have pros and cons. For the family historian and genealogist there needs to be an established protocol in the use of FRS techniques that should accompany every reference to conclusions using this technique. As further advancements occur in the imagery aspects of family history – cameras, post-photograph processing and FRS, it is suggested that at least the following information should be provided when making assertions based on FRS:

1. that FRS for specific family research be limited to off line use as any up loading may be used in an inappropriate way by others;
2. where FRS has been used to identify family members, that there be meticulous notes made of the photographs used and how the process was conducted;
3. the FRS software used;
4. the date of the comparative analysis;
5. detailed account of the use of any photographic enhancement software [e.g. Photoshop, Photo Studio] and what alterations to either or both photographs were made; this part of the reporting should be classified by:
 - a. shape – extent of rotation, cropping, or proportion.
 - b. colour – tone, saturation, colour replacement.
 - c. correction – addition or removal of details, background, scratches, spots, rip marks and other forms of physical blemishes.
 - d. content – joining of two or more photographs or parts thereof by either 'stitching' or overlays.

⁷ Google has been confronted with these issues regarding its publication of street photographs.

- e. distortions – changes in sharpness, barrel or pincushion distortion correction, convergence/divergence adjustment.

Below is a template to assist in the recording of these important details.

Photograph Details	FRS: Date: / /	Use of Photographic Enhancement Software				
		Shape	Colour	Correction	Content	Distortions
1		Rotation Cropping Proportion	Tone Saturation Replacement	Background Scratches Rip Marks	Stitching Collage	Sharpness Barrel distortion Pincushion Convergence
2		Rotation Cropping Proportion	Tone Saturation Replacement	Background Scratches Rip Marks	Stitching Collage	Sharpness Barrel distortion Pincushion Convergence
3		Rotation Cropping Proportion	Tone Saturation Replacement	Background Scratches Rip Marks	Stitching Collage	Sharpness Barrel distortion Pincushion Convergence

In the modern idiom – FRS is pretty cool and ‘in your face’ scary.

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