



*British Association for Human Identification*



**D A B S**  
**Fingerprints/Forensics Ltd**  
(Copyright)



# Image Comparison

**Subject: Image analysis/facial comparison**

Prepared on behalf of:

Tamta Mikeladze  
Georgia

Forensic image comparisons carried out by:

SIGNED: \_\_\_\_\_  
K A Linge BA. MSc. FBIPP.

DATE: 26 August 2011

## Personal Profile

**Kenneth Linge BA. MSc. FBIPP.**

**Forensic Facial mapping-Image comparison and Forensic Photographic Consultant**

I am registered with the **National Police Improvement Agency (NPIA)** and provide services to Police forces and defence lawyers throughout the UK. I have a Master of Science degree in **Facial Mapping**. I am a Former member of the **Home Office Advisory Group to ACPO (Association of Chief Police Officers) on Facial Mapping**, I was a member of the **Home Office Working Group on Digital Imaging**.

From the inception of **CCTV** security I have been actively involved in the development of the science of **Forensic Facial Identification by Image Comparison**-known as **Facial Mapping**. I have contributed to the development of new and existing techniques and working practices constantly testing the reliability and integrity of the evidence that has been submitted. I have been personally involved in over 450 cases in the past 14 years.

## Current Research

This work examines the whole field of facial recognition and identification with regard to **Criminal Evidence, Image quality, CCTV systems, Biometrics, Probability Factors and the development of Computational Facial Recognition Systems**. One of the key proposals contained within this thesis is that any recorded image linked with a crime, is formed by trace material (photons), and should therefore be regarded as a forensic mark.

## Experience

I have been a professional photographer for over forty-five years of which twenty-nine were with the photographic department of **Essex Police**. I was the **Department Head** for 16 years that allowed me to gain valuable experience in the various applications of imagery as an aid to criminal investigation. I also trained **Scenes of Crime Officers** in photographic techniques.

In 1989 I was awarded a fellowship of the prestigious **British Institute of Professional Photography (FBIPP)** recognised by the photographic industry throughout the world.

Other experience acquired includes the lesser-known aspects of the photographic field that include **invisible radiation (UV/IR), image analysis/photographic interpretation, photogrammetry and contemporary technology facilitating image enhancement and forensic pattern matching.**

Facial Mapping consists of the following techniques and methods of comparison.

1. **Image analysis.** A detailed analysis and interpretation of the details within the image.
2. **Morphological comparison** A detailed study and comparison of the shape and form of individual features, and main feature landmarks.
3. **Anthropometric (proportional) comparison** A study and comparison of the spatial relationships of the features and a check for correlation between feature landmarks on two or more sets of images.

Many people share the same general appearance, it is feature detail and unique markings which distinguish one person from another.

### **Instruction**

On 17<sup>th</sup> August 2011 I was asked to carry out forensic analysis and comparisons between a series of 12 images and video footage sent to me by email, to attempt to trace any evidence of video tampering and to ascertain the identity of a person shown on the images.

### **Procedure**

I viewed the video footage at length using frame-by-frame and freeze-frame facilities, I then examined all of the still images at length on a high-resolution monitor using software with a considerable magnification capability and a full range of image optimisation tools.

### **Findings**

**The still images**, consisting of various stills taken from the video footage and post mortem photographs of a deceased, are moderate to good quality colour jpegs on which the camera to subject distance varies. I selected key images for comparison.

## Comparisons

Whenever carrying out any kind of comparison my prime objective is to search for important differences, these are differences that cannot be attributed to image quality, angle or lighting. If one important difference is found it could preclude the possibility that the images are of the same person.

The **morphological comparisons** between the passport image, the post-mortem image and image #4 show no important differences and the following apparent similarities.

1. Face shape
2. Hairline-hair colour
3. Forehead-temporal area – image #4 and the post mortem photograph show a significant swelling on the left temple, possibly resulting from a blow, the position, shape and size are consistent.
4. Supra-orbital ridge
5. Nose type-slightly convex ridge
6. Chin shape-pogonian
7. Ear – helix shape, attached lobe

I then carried out a limited **proportional comparison** between the passport photograph and the post mortem photograph. I revolved the post mortem photograph through 90 degrees counter clockwise and scaled and aligned both images using a computer-generated grid. The grid not only assists with the scaling and aligning of the images but provides co-ordinates thus allowing feature correlation to be verified. Although limited to the vertical feature distribution the comparison revealed many correlations.

I then carried out a comparison between image #2 and image #4. I viewed the images together on a large monitor comparing clothing detail and surrounding features. I concluded that these images showed the same scene from different viewpoints and that the person in question can be identified through the clothing and surroundings.

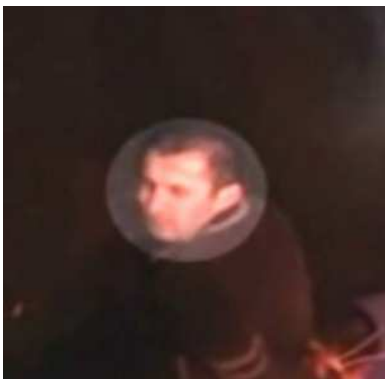
## Conclusions

As no important differences could be found and because of the number of apparent similarities that were found my opinion is that the images lend **strong support** to the contention that all three images, that is the passport image, image #4 and the post-mortem photograph are all of the same person. The post-mortem photograph and image #4 are strongly linked through the swelling on the left temple. The passport image is linked to the post-mortem photograph through both the morphological and the proportional comparisons.

My examination of the **video footage** revealed no evidence of any image tampering apart from normal editing and highlighting and without viewing the original footage I must assume that this is the case.

Copies of some of the images used and illustrations of the comparisons, together with explanatory captions, are shown below and on the following pages. Please note that because of the degradation that takes place when printing and reproducing images, these illustrations are intended as examples only.

## Illustrations



**Image #1**



**Image #2**

**Illustrations**



**Image #3**



**Image #4**



**Passport photograph**



**Enhanced Passport photograph**

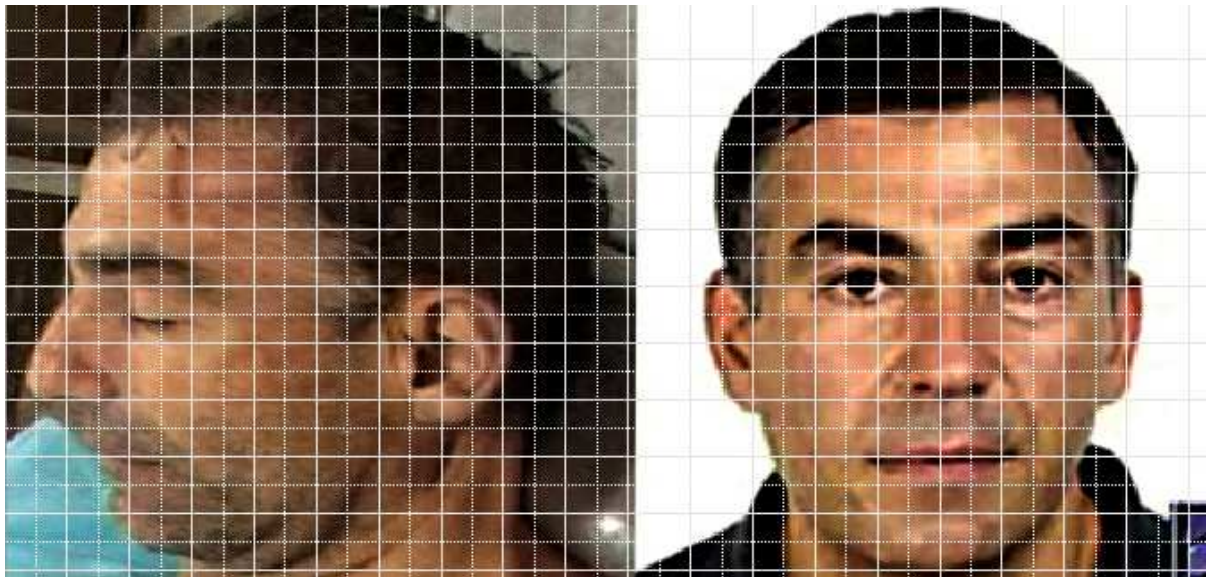


**Example of a post-mortem photograph**

**Illustrations**



**Example of morphological comparisons with some apparent similarities arrowed**



**Example of proportional comparison using computer generated grid, note correlations**



**Further example of comparison with critical similarities arrowed**

Signed K. A Linge