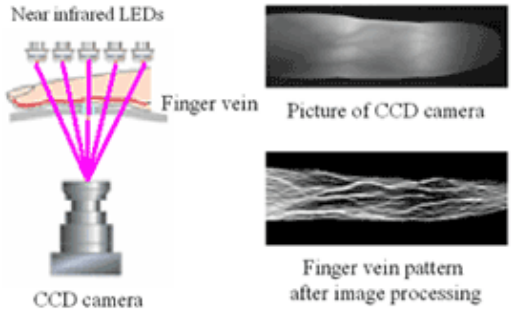
Finger Vein Biometric Technology Introduction

Based on the patterns of veins in one's finger or hand, vascular pattern recognition (VPR) provides the ease of use of hand geometry with much improved accuracy, smaller readers and contactless use. Hitachi's finger vein system scans the veins one's fingers and then match the vein patterns of their respective pre-established templates.

As near infrared light generated by a bank of LEDs (light emitting diodes) penetrates the body tissue, it is reflected in the hemoglobin in the blood. A CCD (charge coupled device) camera (which uses a small, rectangular piece of silicon to receive incoming light) captures the image of the vein pattern through this reflected light. Image processing constructs a finger vein pattern from the camera image. This pattern is compressed and digitized so that it can be registered as a template for biometric authentication. Within a split second, the FV system filters the digitized image, produces a template or digitized image that it compares to the stored template of the user, and determines whether there is a match, using pattern-matching techniques. The actual algorithms used in this process differ from vendor to vendor.



Finger vein systems have won wide acceptance in banking, especially in Japan. Moreover, FV systems have some very powerful advantages. First, there is no property of latency. The vein patterns in fingers stay where they belong, and where no one can see them – in the fingers. This is a huge privacy consideration. Second, vascular sensors are both durable and usable. The sensors are looking below the skin; and they simply don't have issues with finger cuts, moisture or dirt. Third, finger vein systems demonstrate very high accuracy rates, currently higher than fingerprint imaging, and they are very difficult to spoof; however, the relative accuracy of the two technologies could change over time since fingerprint technology has been making significant improvements. Fourth, the finger vein systems are near contactless. What that means is that only the very top of the finger makes contact; and that is just to align the finger for consistent imaging. The middle part of the finger (the middle phalanx) from where the CCD camera captures its image has no surface contact with anything. Last, finger vein systems are extremely easy to use as they are fairly intuitive and require very little training on the part of the user.