

## Vascular Pattern Biometric Identification System

### Summary/Characteristics

The software developed by the Carlos III University (UC3M) allows for the immediate recognition of individuals through wrist vascular biometrics. It uses infrared images so that identification is performed without physical contact.

The images, taken with infrared LED lighting and a small-sized USB camera, are modified to better capture the radiation. They are then processed by means of artificial intelligence, allowing for an optimized and real-time visualization of vascular structures.

The system captures high-resolution images in real time, applying deep learning algorithms to identify, contrast, and highlight veins with precision, which allows for greater accuracy in processes such as blood draws, injections, emergency services, home medical assistance...

The device has been designed to be portable and easily integrates with mobile devices via USB.

### Innovative Aspects

- Use of the wrist as a vascular identification zone, making it practically immune to spoofing.
- Biometric recognition without the need for physical contact, increasing security and hygiene in identification.
- Use of infrared images optimized through LED lighting and a small-sized USB camera.
- Possibility of integration into low-cost operating minicomputers, favoring portability and versatility of applications.

### Competitive Advantages

- Real – time processing, offering immediate results for secure identification.
- Compact and low-cost system, accessible and easily integrated into various devices.
- Greater user comfort and acceptance as it does not require physical contact.
- Potential for use in high-traffic environments (access points, identity control, security). Thanks to its speed and simplicity, provides a unique ROI due to its ability to function as both a security gatekeeper and a clinical aid.



### Technology readiness level:

Ready for demonstration. Tests in controlled environments completed. TRL 6-7.

### Intellectual and Industrial Property Status:

Registered software. Title: "System for recognizing individuals through the vascular structure of the wrist with homogeneous illumination".