

Patent Summary

The IIT Indore patent on “Spoof Recognition in an Ear Biometric System” is granted by the Patent Office, Government of India. The inventors Prof. Vimal Bhatia, Dr. Amit Chatterjee, and Mr. Puneet Singh Thakur, from the Indian Institute of Technology Indore, and Prof. Shashi Prakash from IET DAVV, have proposed an ear biometric system, based on fringe projection thermographic method for preventing spoofing in biometric authentication.

Biometrics may be defined as physiological (like a fingerprint, DNA, iris, retina, face, etc.) and behavioral (like a signature, typing rhythm, voice, etc.) traits, that can be used for unique recognition of an individual. Due to high security, universality, and ease of use, biometrics is becoming the most commonly used personal authentication for many security applications in today’s world. Traditionally, fingerprint recognition is performed by 2D and 3D imaging methods. However, several factors like nonlinear distortion, non-uniform illumination, improper skin condition, high computation, high possibility of duplication, etc. reduce fingerprints’ applicability in security applications. Thus, as an alternative, the human ear (a viable new class of biometric) has recently gained popularity in both the research community and industry. The ear has several advantages over conventional biometric traits (fingerprint, face, iris). Firstly, it can be captured without even a fully cooperative subject (as its field of view is larger as compared to fingerprints and smaller as compared to face). Secondly, it has a stable structure that does not alter much with age or facial expression. Finally, it is unaltered by different emotional or physical constraints (like tremor, anxiety, fear, and others).

The objective of the invention is to provide a robust, touchless, spoof detection system and method for ear biometrics based on fringe projection thermography and image processing techniques. The method utilizes white light imaging, fringe projection, and a thermal imaging system. The method requires a DLP projector source, a USB camera, a thermal camera, and an image processing unit for its operation. Characterization of fringe projected images and photo attack detection is performed by using analog and binary features of variogram assisted line scan profiles. Characterization of thermal images and high-level attack (video and 3D dummy) detection was performed by using mean, and variance-based thermal features. The present system and method are completely touchless.

For Immediate Release:

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Inventors- Prof. Vimal Bhatia, Dr. Amit Chatterjee, Mr. Puneet Singh Thakur, and Prof. Shashi Prakash

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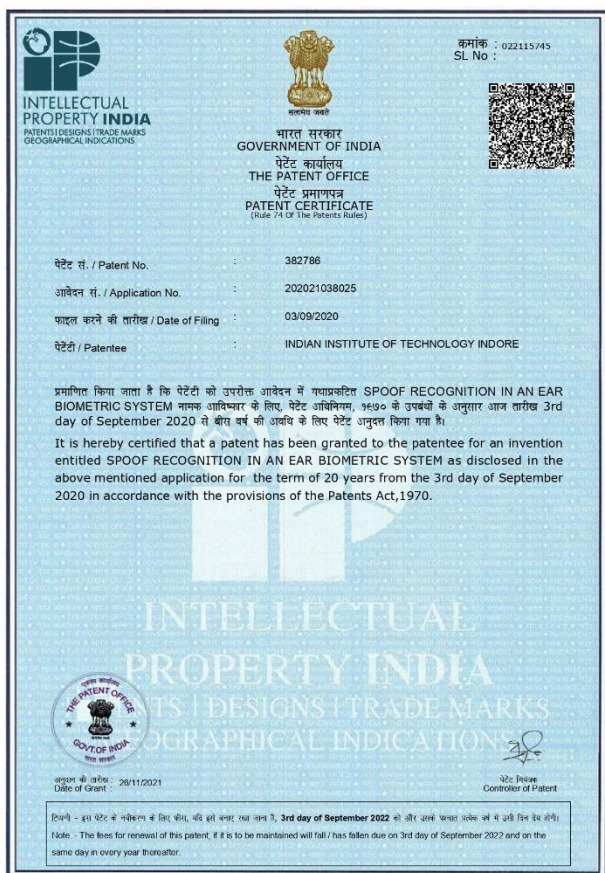
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Professor Vimal Bhatia is currently working as a professor at the Indian Institute of Technology Indore. His research interests are in the broader areas of Wireless and Optical Communications, AI/Machine Learning, Signal Processing applications in telecommunications, optics, RADAR, and software product development.

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Professor Shashi Prakash is currently working as a professor at the Institute of Engineering and Technology Indore. His current research interest is optical metrology, laser-based instrumentation, and optical networks.



Prof. Vimal Bhatia



Dr. Amit Chatterjee



Mr. Puneet Singh Thakur



Prof. Shashi Prakash