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Developing an On-Air Hand Doodle System to Secure Aadhar Biometric Scheme for Aging Society

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Abstract

It is more convenient to remember drawings than text based passwords and in case of biometric elderly people tend to degrade their fingerprint recognition and drawing can be changed accordingly in such cases, for children also drawings are more favorable and rememberable. In this method, image which is drawn by the user is processed using image processing by applying CNN technique and applying filters such as Kalman filter to enhance the image drawn which will then be encrypted for security and then compared with the key in the server if it is matched then the user will be authorized.

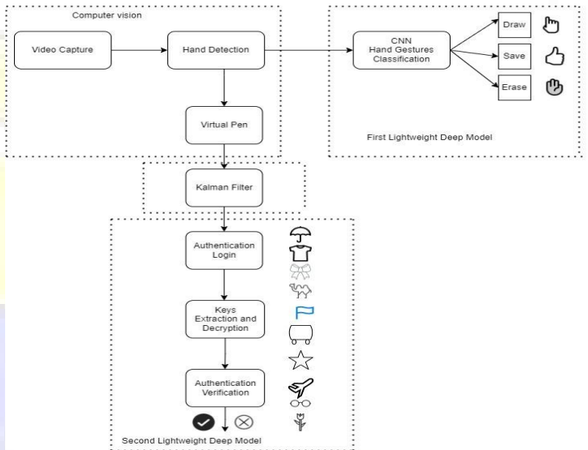
Problem Statement

To implement a system for elderly community to provide a secure encrypted password as a hand-drawn doodle which will succeed textual as well as biometric scheme. If biometric is leaked once it can't be changed forever, and in textual it is difficult to remember passwords since those contain combinations of alphabets, special characters, and numbers and require a specific length. Instead of using traditional methods for authorization like fingerprint biometric, text password which includes special characters, alphanumeric keys in this idea we propose the use of drawings as the way of authorization. This system's main purpose is to accomplish 2 main goals, usability and security.

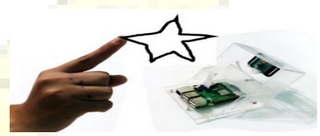
Literature Survey

Sl No	Paper Name	Algorithm/Techniques	Performance	Advantages	Limitations
1.	RF-Wri: An Efficient Framework for RF-Based Device-Free Air-Writing Recognition	Software defined radios (SDR),Discrete Wavelet Transform(DWT) filters and letter segmentation algorithms.	95% accuracy in the classification of all air-written letters and recognition approaches.	Letter segmentation processes increase the quality of the collected data.	The large-scale movements are used and this will decrease the recognition accuracy.
2.	WiWrite: An Accurate Device-Free Handwriting Recognition System with COTS WiFi	Commercial off-the-shelf(COTS) , SElf paced dense convolution network(SPDCN), CNN and COIS wifi hardware.	This will avoid handwriting and mainly overcome blurred vision and neurological diseases in the people.	A Wi-write and CSI division scheme is used to reduce amplitude noise.	Fine-grained finger tracking for automatic retain of low noise data.
3.	Challenge-Response Authentication using In-Air Handwriting Style Verification	Challenge-response (CR),The MoCRA system,support vector machine (SVM).	The result shows that MoCRA can authenticate one of 24 subjects with an average equal error rate of 1.18%.	It rejects the pretenders with the error rate of 2.45% and also attackers who are writing multiple times.	Challenge-response can be used even if the communication channel is insecure.
4.	MicaPen: A Pen to Write in Air Using Mica Motes	MicaPen,Micaz motes,accelerometer MTS310 sensor board and MICAz sensor .	Characters written in cursive which will be different from recognizing strokes. This also incorporates MicaPen.	This concept is used for various hand gestures and sign-language recognition in real world applications.	Low-cost and used by only disabled who don't have fingers or limbs.
5.	AirNote – Pen it Down!	Smart wearables,deep learning techniques ,RCNN and SSD.	Faster RCNN was much better in terms of accuracy as compared to SSD.	Useful to senior citizens or people who don't like using phones.	Handwriting recognizer and lack in solving the pen-up and pen-down issue.
6.	Visual Gesture Recognition for Text writing in Air	CNN,Gaussian blurring and threshold algorithm	The accuracy which was attained using the system was 86.9%.	Interaction with other applications, and used to unlock the smartphone as a password by drawing.	The problems associated with accuracy are stroke shape of word and complicated background.
7.	A Sketch Classifier Technique with Deep Learning Models with Embedded System	CNN,deep neural network, Principal components analysis (PCA) ,Radial basis function(RBF),K-nearest-neighbors,SVM.	System recognition rate is above 98% on average.	We use the deep learning model and simplify the parameters to achieve the high-performance result.	For reducing the number of parameters,computation, Handwriting recognition.

System Architecture



Expected Outcome



Conclusion

In this system, we proposes a new authentication method for elderly people to authenticate themselves based on air hand-drawn passwords in public distribution system. In addition, the proposed method is secure and resistant to physical observation threats. This will help to overcome textual as well as biometric scheme.