

In This Issue. . .

- **Reader's Space:** Mobile camera Image based Robust and fast OMR Evaluation by, Kshitij Rachchh M.Tech, Communication systems.
- **Computational Intelligence:** SVM approach to number plate recognition and classification system .
- **Pattern Recognition:** Karhunen-Loeve transform based hand identification system .
- **Signal Processing:** A novel approach to transformed biometrics using successive projections

Dear friends! COMPSIG NITT is a monthly newsletter to share the research work done in the Pattern recognition and computational intelligence laboratory, Department of Electronics and Communication Engineering, National Institute of Technology Trichy.

Concepts, Ideas pertaining to Computational intelligence, Pattern recognition and Signal processing are also included in this newsletter.

We expect the feedback, comments and articles from you all.

Issue 2-3: March 2016

Team members

1. **Dr.E.S.Gopi, Co-ordinator**
2. **G.JayaBrindha, Ph.D. Scholar.**
3. **M.Neema, Ph.D. Scholar.**
4. **Samuel Cherukutty Cheruvathur, M.Tech, Communication systems.**
5. **Kshitij H. Rachchh, M.Tech, Communication systems.**

Mobile camera Image based Robust and fast OMR Evaluation

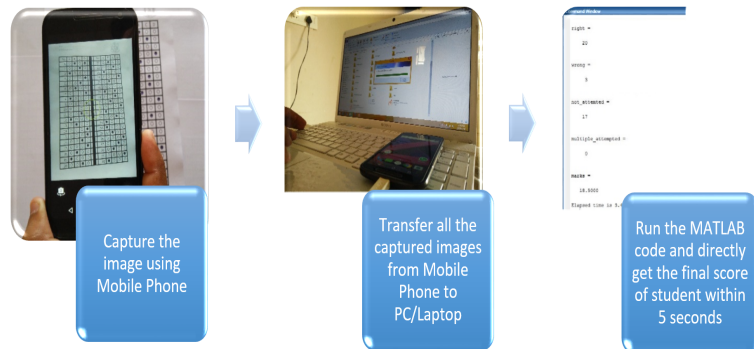


Figure 1: Procedure Steps

Fast and Robust OMR Evaluation Technique has been developed. Steps to implement this technique are explained in Figure 1. This algorithm is applied to over 100 images and 100% accuracy is observed after observing the output. For checking the real time performance of this technique, one CPC exam was conducted for M.Tech ECE department and all the OMR sheets were evaluated using this technique. The technique is successfully evaluating the OMR sheets with 100% accuracy and output can be achieved within 5 seconds.

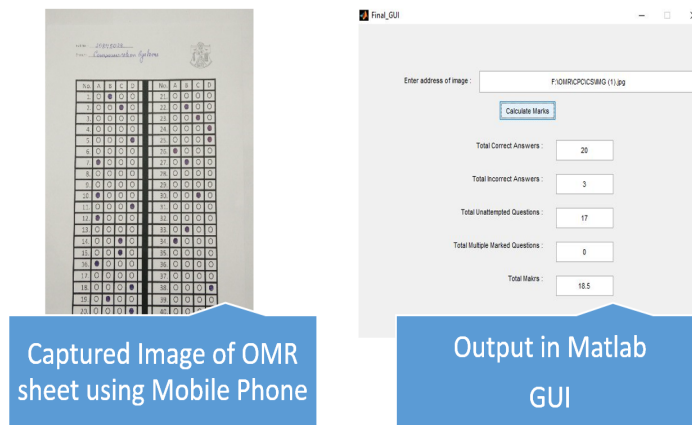


Figure 2: Experimental Output

For further discussions contact: Mr.Kshitij Rachchh, M.Tech, Communication systems.

Mail Id: rachchhk@yahoo.com

[Back to Contents](#)

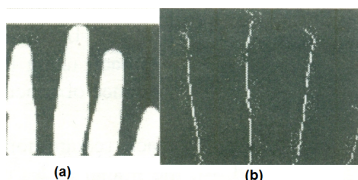
Computational Intelligence



Automatic maintenance of the bus arrival time requires Numberplate recognition. One way to achieve the same is by making use of Support Vector Machine (SVM) approach. SVM involves in finding the classification boundaries of the multi class problem. The features from the Numberplate are extracted directly from

the spatial domain and wavelet domain to get two sets of vectors. 75% of the collected vectors are used for training the vector for constructing the two SVM classifier (Spatial domain and wavelet domain). 25% of the collected vectors are used for testing. 55.65% success is achieved in case of spatial domain method. 77.78% success is achieved in case of offfrequency domain approach. For further details : <http://ieeexplore.ieee.org/SVM approach to number plate recognition>.

Pattern Recognition

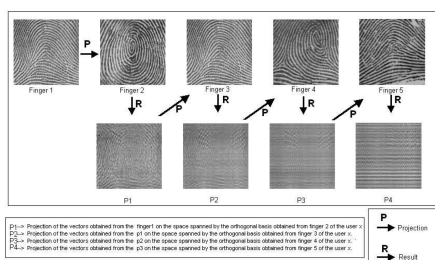


In this, we propose a KLT based hand identification system for personal identification. These approach offers more scope for credible authentication as compared to finger print recognition. The images of the hand are taken and length of the fingers is computed using gradient method. These are used as features for categorizing the palm. The variance of the lines in the palm is

calculated for all sub blocks of the palm image to get another set of feature vectors. Therefore number of parameters which have to be matched for authentication are more in the case of palm than a finger. Our approach to extract the palm and fingers from the image reduces the computation time for recognition.

For further details : <http://ieeexplore.ieee.org/session5A/Transformed Biometrics using ANN>

Signal Processing



Unlike user created password, number of biometrics is limited for creating account in different organizations. Transformed biometrics attempts to solve the problem by transforming the biometric into another form, which is unique to the particular organization. This makes the availability of different transformed biometrics in different organizations transformed from the same biometrics and helps in foolproof transactions. In this

article a novel approach to transformed biometrics using successive projection technique is suggested. In the proposed technique, the user can register up to $5 \times 4n - 1$ organizations if the length of the biometric password is n .

For further details : <http://proceedings.spiedigitallibrary.org/Transformed biometrics>

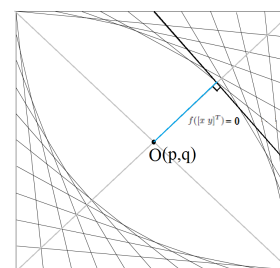
[Back to Contents](#)

Quotes

"To succeed in life and achieve results, you must understand and master three mighty forces – desire, belief, and expectation." — Dr. A.P.J. Abdul kalam

IDEA

In the figure shown below, how can you measure the eye opening? Without actual co-ordinates it is difficult to find the dimensions of the eye. The eye opening is approximated using the set of lines drawn as shown in the figure. The width of the eye opening is approximated as 2 times the perpendicular distance measured from the point $O(p, q)$ to the line $f([x y]^T) = W^T [x y]^T + b = 0$, and it is measured as $f([p q]^T) / \|W\|$.



[Back to Contents](#)

Feedback

COMPSIG NITT invites articles and innovative ideas from readers for the [Reader's Space](#) column. We expect feedback, comments and the articles to monthly newsletter [COMPSIG NITT](#).

[Back to Contents](#)

Contact Information:

[Pattern Recognition and Computational Intelligence Laboratory](#),
Department of Electronics and
Communication Engineering,
National Institute of Technology
Trichy - 620015

E-mail: esgopi@nitt.edu