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# RESUME

**ACHINT OOMMEN THOMAS**

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## Educational Qualifications

- PhD, Computer Science  
Advisor: Dr. Venugopal Govindaraju  
Graduated in 2010 from University at Buffalo, SUNY, NY
- MS, Computer Science  
Graduated in 2007 from University at Buffalo, SUNY, NY
- BE, Computer Science and Engineering  
Graduated in 2005 from M. S. Ramaiah Institute of Technology (Visveswaraya Technological University), Bangalore

## Areas of Interest

Machine Vision, Image Processing, Human Interactive Proofs, Biometrics, Machine Learning

## Work Experience

- **Scientist** with the Audience Sciences group at Yahoo! Research, Santa Clara, CA  
**Period:** Jul 2010 to Present
- **Summer Intern** at Yahoo! Inc., Sunnyvale, CA  
**Period:** May 2009 to Aug 2009  
**Responsibilities:** Prototyping new CAPTCHA techniques for use by Yahoo! in distinguishing between human and machine traffic.
- **Research Intern** at IBM's T. J. Watson Research Lab, Hawthorne, NY  
**Period:** Feb 2008 to Aug 2008  
**Responsibilities:** Performance evaluation of various cancelable fingerprint biometric algorithms and development of demos to showcase real world use case scenarios involving cancelable fingerprint biometrics.

## Publications

- Achint Thomas, Sulabh Choudhury and Venu Govindaraju, "*Leveraging the Mixed-text Segmentation Problem to design Secure Handwritten CAPTCHAs*"; to be presented at the 2nd International Conference on Frontiers in Handwriting Recognition, ICFHR 2010, Kolkota, India, Nov. 2010.
  - Anurag Bhardwaj, Achint Thomas, Yun Fu and Venu Govindaraju, "*Retrieving Handwriting Styles: A Content Based Approach to Handwritten Document Retrieval*"; to be presented at the 2nd International Conference on Frontiers in Handwriting Recognition, ICFHR 2010, Kolkota, India, Nov. 2010.
  - A. Rusu, A. Thomas, and V. Govindaraju, "*Generation and use of handwritten CAPTCHAs*"; to be published in International Journal on Document Analysis and Recognition; Sprniger. doi: <http://www.springerlink.com/content/00538732867v1911/>.
  - Achint O. Thomas, Amalia Rusu and Venu Govindaraju, "*Synthetic Handwritten CAPTCHAs*"; Pattern Recognition Journal: Special Issue on Handwriting Recognition; PR 42 (2009) pp. 3365-3373; Elsevier.
  - Achint O. Thomas, Nalini Ratha, Jonathan Connell and Ruud Bolle, "*Comparative Analysis of Registration Based and Registration Free Methods for Cancelable Fingerprint Biometrics*"; In Proc. of the 1<sup>9th</sup> International Conference on Pattern Recognition, ICPR 2008, in Tampa, FL, USA, Dec 2008.
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- Achint O. Thomas and Venu Govindaraju, "*Generation and Performance Evaluation of Synthetic Handwritten CAPTCHAs*"; In Proc. of the First International Conference on Frontiers in Handwriting Recognition, ICFHR 2008, Canada; Aug 2008, pp 457 – 462.
  - Achint O. Thomas, Amalia Rusu, Smruthi Mukund and Venu Govindaraju, "*Non-Writer Specific Synthetic Handwriting Generation for the CAPTCHA Application*"; IEEE Signal Processing Society 2007 Western New York Image Processing Workshop.
  - K.G. Srinivasa, A.O. Thomas, Amrinder Singh, K.R. Venugopal, Lalit M. Patnaik, "*Generic Feature Extraction for Classification using Fuzzy C-Means Clustering*"; In Proc of The Third International Conference on Intelligent Sensing and Information Processing 2005.
  - P. Deepa Shenoy, K.G. Srinivasa, A.O. Thomas, K.R. Venugopal, Lalit M. Patnaik, "*Mining Top-k Ranked Web Pages using Simulated Annealing and Genetic Algorithms*"; in Proc of Asian Applied Computing Conference (AACC 2004); Springer Verlag, LNCS 3285, 2004, pp 137-144.
  - P. Deepa Shenoy, K.G. Srinivasa, A.O. Thomas, K.R. Venugopal, Lalit M. Patnaik, "*Compress and Mine: An Efficient Graph Based Algorithm for Generating Multiple Level Frequent Itemsets*"; in Proc of The 11th International Conference on Advanced Computing and Communications (ADCOM 2003); Dec 2003, pp 33-38.

### **Projects and Technical Reports**

- Simulation of a Reconfigurable Fovea Designed for Object Tracking - The project dealt with the simulation of a reconfigurable fovea designed for single object tracking. Foveal parameters like gate size, number of perifoveal levels and initial fovea location were varied and the system performance in terms of object tracking accuracy versus noise was studied. Multiple objects tracking was also looked into and interesting observations made.
  - Text Independent Speaker Identification - The project dealt with text independent speaker recognition. Data pre-processing using pre-emphasis and feature extraction using mel-cepstrum co-efficients was performed. The speaker models were generated using two types of vector quantization for codebook generation. Classification accuracies for the two methods were compared and system performance determined in terms of ROC curves.
  - Unsupervised Classification of Treatment Resistant and Non-Resistant Cancerous Cells – The project involved mining relevant features for the binary classification task of treatment resistant cancerous tissue and treatment non-resistant tissue.
  - Simulation of Short Term Memory and Long Term Memory using Hopfield Networks – The objective was to build a software system to simulate the human memory system w.r.t. short term memory and long term memory, and explore the interaction between them. This was achieved using Hopfield Networks and Hebbian learning.
  - Maximum Ball Skeleton Object Recovery - The objective was to design an algorithm to compute maximum ball skeletons of all objects in a given binary image. It had to be shown that reconstruction of the exact original image from its labeled skeletons was possible.
  - Design of a Two-Class Classifier - This project involved a classification task on a spam email dataset that represented a 2-class problem. The objective was to build the best possible classifier with highest accuracy on an unseen test dataset. After analysis of the data, a feed forward neural network was designed to perform the classification task.
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