

CURRICULUM VITAE

PERSONAL DETAILS

- Full name: **THI HOANG NGAN LE**
- Date of birth: August 25, 1983
- Mailing address:
 - o Biometrics CyLab Center, Electrical & Computer Engineering, Carnegie Mellon University, 5000 Forbes Ave, Pittsburgh, PA, 15213, USA (Work).
 - o 5641 Phillips Ave, Pittsburgh, PA 15217, USA
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- Personal homepage: www.andrew.cmu.edu/user/thihoanl

ACADEMIC HISTORY

- Research Assistant at CMU CyLab Biometrics Center, Carnegie Mellon University, Pittsburgh, USA
 - o Year: Sep. 2011 to present
- Ph.D Student in Electrical and Computer Engineering at Carnegie Mellon University
 - o Department of ECE at Carnegie Mellon University, Pittsburgh, US.
 - o Year: Sept. 2011 – Present.
 - o Supervisors: Prof. T. D. Bui. and Prof. Marios Savvides.
 - o Research Interests: Soft Biometrics and Image Segmentation, Machine Learning, Deep Learning, Dimensionality Reduction, Sparse Representation, Compressive Sensing.
- Research Assistant at CENPARMI (Centre for Pattern Recognition and Machine Intelligence), Concordia University, Canada.
 - o Year: May. 2010 – Sept. 2011.
- Ph.D Candidate in Computer Science
 - o Department of Computer Science, Concordia University, Canada.
 - o Year: May. 2010 – Sept. 2011.
 - o Supervisors: Prof. T. D. Bui. and Prof. Ching Y. Suen.

- Research Interests: Document Image Analysis (Preprocessing – Binarization, Segmentation, Word Recognition); Active Contours based Image Segmentation; Compressed Sensing; Digital Image Processing.
- Research Assistant of MSN Lab, Feng Chia University, Taichung, Taiwan.
 - Year: 2008-2009.
- Master of Computer Science.
 - Department of Computer Science, Faculty of Information Technology, University of Sciences, HCM City.
 - Year: 2006-2009.
 - Supervisors: Prof. C.C. Chang and Prof. H. B. Le.
 - Major in Computer Sciences. Mark: 10/10.
- Bachelor of Information Technology.
 - Department of Computer Science, Faculty of Information Technology, University of Sciences, HCM City.
 - Year: 2001-2005.
 - Supervisor: Hoai Bac Le.
 - Major in Knowledge Engineering. Rank: Excellent. Mark: 10/10

THESES

- Le. T. H. N., “Secret Sharing Using Multiple Shadow Images”, Master Thesis, University of Science, 2009.
- Le. T. H. N., “Data Hiding in Digital Audio”, Bachelor Thesis, University of Science, 2005.

SCHOLARSHIPS AND AWARDS

- PhD Scholarship in Carnegie Mellon University, U.S., in 4 years from Sep. 2011
- Invited for a Ph.D Scholarship in Clemson University, U.S., in 4 years from 2010 (\$24,000/year plus tuition fees, haven't accepted).
- PhD Scholarship in Concordia University, Canada in 4 years from May 2010

- The best paper award of the International Symposium on Electronic Commerce and Security, ISECS 2008.
- Scholarship of Vietnamese Government for Graduated Students, 2008-2010 .
- Best paper award, International Symposium on Electronic Commerce and Security, China, 2008.
- Second Prize of “Vietnamese Talents” Competition of Dantri Newspaper, 2007.
- First Prize of “Light the Hope” of Vietnamese Government for helping disable people 2007.
- First Prize of Nationwide Student’s Research Competition 2005.
- First Prize of VIFOTEC (Vietnam Fund for Supporting Technology) 2005.
- Scholarship of Tuong Minh Company, 2004.

RESEARCH EXPERIENCE

- Reviewer: Journal of Signal Processing since 2009.
- IEEE Graduate Student Member.
- Research Assistant at CENPARMI, Concordia University, Canada (9.2012 - present)
- Research Assistant at CENPARMI, Concordia University, Canada (5.2010 - 9.2012)
- Research Assistant at AILab, University of Natural Sciences, Vietnam (9.2005- 12.2007):
 - o Data hiding: audio watermarking using psychoacoustic auditory model and spread spectrum theory.
 - o “Listen me!” software: the free software using computer vision and speech processing techniques to help the Deaf to improve their pronunciation ability.

WORK EXPERIENCE

- From 9.2011 to present: Work on soft-biometrics project, particularly face recognition, facial decomposition.
 - o Project - “*Enhanced – Level II Detail Facial Soft Biometrics for an Automatic Forensic-style approach to Facial Matching/Sorting*”, sponsored by Army Research Lab, \$720,000 (from Feb. 2013 to Feb. 2015).

- Project - “*Soft Biometric Indexing with Matcher Fusion for Robust Identification*”, sponsored by Army Research Lab, \$695,000 (from Oct. 2011 to Oct. 2013).
- From 5.2010 to 9. 2011: Work with IMDS company in Document Analysis project.
- From 8.2009 to 5-2010: Being IT executive of PMDC Corp. and have been working on E-Government project (sponsor: the World Bank) and MIS project (sponsor: UNDP).
- From 1.2009 to 5-2010: Being as a Lecturer in Department of Computer Sciences, Faculty of Information Technology, University of Science – 227 Nguyen Van Cu St., Dist. 5, HCM City, Vietnam.
- From 8.2008 to 1.2009: Being as a Teaching Assistant in Computer Sciences Department, DaYeh University, Dacun, Chunghua, Taiwan.
- From 1.2008 to 1.2009: Being as a Researcher MSN Lab, Feng Chia University, Taichung, Taiwan.
- From 8.2005 to 1.2008: Teaching Assistant in Faculty of Information Technology, University of Natural Sciences – 227 Nguyen Van Cu St., Dist. 5, HCM City, Vietnam.

SELECT PUBLICATIONS

International Journal

- [1] **T. Hoang Ngan Le**, U. Prabhu., and Savvides, M., "Automatic Eyebrow Detection, Segmentation, and Matching System - EDMS," IEEE Trans. on Image Processing (TIP), 2013. (under review).
- [2] **T. Hoang Ngan Le**, and Savvides, M., "A Novel Shape Constrained Feature-based Active Contour Model for Lip Segmentation," IEEE Signal Processing Letters, 2013.
- [3] **Le, T. H. N**, Luu, K., Seshadri, K., and Savvides, M., "FAAD: A Facial Aging and Asymmetry Decomposition to Twins Identification," IEEE Transactions on Pattern Recognition and Machine Intelligence (PAMI), 2012 (Under review).
- [4] **T. Hoang Ngan Le**, Luu, K., and Savvides, M., "SparCLeS: Dynamic L1 Sparse Classifiers with Level Sets for Robust Beard/Moustache Detection and Segmentation," IEEE Trans. on Image Processing (TIP), Vol. 22, No. 8, pp. 3097-3107, Aug. 2013.

- [5] Luu, K., **Le, T. H. N.**, and Savvides, M., "Compressed Sensing Face Models (CSM) and Its Application in Face Modeling", IEEE Transactions on Pattern Recognition and Machine Intelligence (PAMI), 2012 (Under review).
- [6] **Le, T. H. N.**, Lin, C. C., Chang, C. C., and Le, H. B., "A high quality and small shadow size visual secret sharing scheme based on hybrid strategy for grayscale images," Journal of Digital Signal Processing Vol. 21, Issue 6, pp. 734 - 745, 2011
- [7] **Le, T. H. N.**, Bui, T. D., Suen, C. Y., "Binarization of Degraded Document Images Using Morphological Operators and Ternary Entropy-Based Approach," submitted to Transactions on Image Processing on August 14.
- [8] Chen, W. J., Chang, C. C., and **Le, T. H. N.**, "High Payload Steganography Mechanism Using Hybrid Edge Detector", Journal of Expert Systems with Application, Vol. 37, No. 4, pp. 3292-3301, April, 2010.
- [9] Chang, C. C., Lee, J. S., **Le, T. H. N.**, "Improved Wet Paper Coding Based on an n-Indicator and a Fuzzy Edge Detector," Journal of Digital Signal Processing, Vol. 20, Issue 4, pp. 1286-1307, 2010
- [10] Chang, C. C., Lin, C. C., **Le, T. H. N.** and Le, H. B., "Sharing a Verifiable Secret Image Using Two Shadows," Pattern Recognition, Vol. 42, Issue 1, pp. 3097-3114, May, 2009.
- [11] Chang, C. C., Lin, C. C., **Le, T. H. N.**, and Le, H. B., "Self Verifying Visual Secret Sharing Using Error Diffusion and Interpolation Techniques," IEEE Transactions on Information Forensics and Security, Vol. 4, Issue 4, pp. 790 – 801, Dec. 2009.
- [12] Chang, C. C., Lin, C. C., **Le, T. H. N.**, and Le, H. B., "A Probabilistic Visual Secret Sharing Scheme for Grayscale Images with Voting Strategy," International Journal of Intelligent Information Technology Application (IJITA), Vol. 1, No. 1, Jul. 2008, pp. 1-9.

International Conference

1. **T. Hoang Ngan Le**, Luu, K., Seshadri, K., and Savvides, M. "A Facial Aging Approach to Identification of Identical Twins", the IEEE Fifth International Conference on Biometrics: Theory, Applications and Systems (BTAS 2012), pp. 91-98, Washington DC, US. Sept. 2012.

2. **T. Hoang Ngan Le**, Luu, K., U. Prabhu, Savvides, M., "A Novel Energy based Filter for Cross-Blink Eye Detection," Intl. Conf. on Image Processing (ICIP'12), Orlando, US., Sept. 2012. pp. 1845-1848.
3. **T. Hoang Ngan Le**, Luu, K., Seshadri, K., and Savvides, M., "Beard and Mustache Segmentation Using Sparse Classifiers on Self-Quotient Images", Intl. Conf. on Image Processing (ICIP'12), Orlando, US., Sept. 2012, pp. 165-168.
4. Luu, K., **T. Hoang Ngan Le**, Seshadri, K., and Savvides, M., "FaceCut - A Robust Approach for Facial Feature Segmentation", Intl. Conf. on Image Processing (ICIP'12), Orlando, US., Sept. 2012, pp. 1841--1844.
5. Mhiri, F., **T. Hoang Ngan Le**, Duong, L., and Cheriet, M., " A New Adaptive Segmentation Framework of Tubular Structures in X-Ray Angiography", Intl. Conf. on Information Science, Signal Processing & their application (ISSPA 2012), Quebec, Canada, pp. 496-500, July, 2012.
6. **Le, T. H. N.**, Bui, T. D., Suen, C. Y. "Ternary Entropy-based Binarization of Degraded Document Images Using Morphological Operators", Intl. Conf. on Document Analysis and Recognition (ICDAR 2011), pp. 114-118, Beijing, China, September, 2011.
7. **Le, T. H. N.**, Nguyen. K. H, Le, H. Bac, "Literature Survey on Watermarking Tools, Watermark Attacks, and Benchmarking Tools", The 2nd International Conferences on Advances in Multimedia (MMEDIA), pp. 67-73, Greece, 2010.
8. **Le, T. H. N.**, Nguyen. K. H, Le, H. Bac, "A Robust Biometric Watermark-Based Authentication Scheme" The 5th International Conference on Digital Information Management (ICDIM), pp. 398-403, Canada, 2010.
9. **Le, T. H. N**, "Holistic Word Recognition using Support Vector Regression in Combination with Spectral Regression", Woman in Machine Learning workshop, Held in Conjunction with Neural Information Processing Systems (NIPS 2010), Canada, 2010.
10. Lee, J. S., **Le, T. H. N**, "Hybrid (2, n) Visual Secret Sharing Scheme for Color Images", International Conference on Computing and Telecommunication Technologies, pp.1-8, 2009.
11. Chang, C. C., Lin, C. C., **Le, T. H. N**, and Le, H. B., "A New Probabilistic Visual Secret Sharing Scheme for Color Images," Proceedings of the Fourth International

Conference on Intelligent Information Hiding and Multimedia Signal Processing (IIHMSP 2008), pp. 1305-1308, China, Aug. 2008.

Local Journal

1. Le Hoai Bac, Luu Khoa, Le Thi Hoang Ngan, "Audio watermarking using psychoacoustic auditory model and spread spectrum theory", Post, Telecommunications and Information Technology Journal, Vietnam, April 2006.

PATENTS

- [1]. **T. Hoang Ngan Le**, K. Luu and M. Savvides, "SparCLeS: Dynamic L1 sparse Classifiers with Level Sets for Robust Beard/Moustache Detection and Segmentation", 2013
Grants: DAAD19-02-1-0389 and W911NF-09-1-027 from the Army Research Office and by cooperative agreement W911NF-10-2-0028 from the Army Research Laboratory
- [2]. K. Luu, S. Venugopalan, **T. Hoang Ngan Le** and M. Savvides, "Sparse Class Dependent Feature Analysis", 2012
- [3]. **T. Hoang Ngan Le**, Utsav Prabhu, Marios Savvides, "Automatic Eyebrow Detection, Segmentation, and Matching System - EDMS", 2013
Grants: DAAD19-02-1-0389 and W911NF-09-1-027 from the Army Research Office and by cooperative agreement W911NF-10-2-0028 from the Army Research Laboratory
- [4]. **T. Hoang Ngan Le**, M. Savvides, "Facial Aging and Asymmetry Decomposition Based Approaches to Identification of Twins", 2013
Grants: DAAD19-02-1-0389 and W911NF-09-1-027 from the Army Research Office and by cooperative agreement W911NF-10-2-0028 from the Army Research Laboratory
- [5]. **T. Hoang Ngan Le**, Marios Savvides, Boyiadzis Michael, Contis Lydia, Biometric Analysis of Peripheral Blood Cells using Advanced Pattern Recognition, 2013.

MY RESEARCH IN MEDIA

- “*Lines on the face help pick out the twin who dunnit*”, NewScientist, Jul. 19, 2013, <http://www.newscientist.com/article/mg21929266.200-lines-on-the-face-help-pick-out-the-twin-who-dunnit.html#.UibDpzZwp8E>
- “*A Face in the Crowd: Say goodbye to anonymity*”, 60 Minutes - CBS News, May 19, 2013. <http://www.cbsnews.com/video/watch/?id=50147158n>
- “*Facial recognition marks the end of anonymity*”, BBC News, Sep. 26, 2011. <http://www.bbc.co.uk/news/magazine-15069858>
- “*Giấu dữ liệu trên âm thanh số*”, Tuoitre News, Jan. 16, 2006 (in Vietnamese) <http://nhipsongso.tuoitre.vn/Nhip-song-so/118773/Giau-du-lieu-tren-am-thanh-so.html>
- “*Sản phẩm đoạt giải thấp sáng niềm tin đều miễn phí*”, VnExpress News, April 19, 2006 (in Vietnamese). <http://www.andrew.cmu.edu/user/kluu/vnexpress.htm>

Pittsburgh, PA, September 2013

Thi Hoang Ngan Le