Hoang Trinh

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Research Experience

- Jun 2010 – present: Postdoctoral Researcher, IBM Research at T. J. Watson Center.
  - Work on multiple video surveillance and analytics systems.
  - UAV video event detection and summarization.
  - Human activity recognition
  - Object detection and tracking
- 2006 – Jun 2010: Research Assistant, Toyota Technological Institute at Chicago.
  - Hard Conditional EM for Unsupervised Learning in MRF Models
  - Unsupervised Training of Monocular Depth Prediction.
  - Four-view scene structure and motion estimation from stereo sequences.
  - Segmentation-based Stereo Depth Estimation.
  - Particle-based Belief Propagation as Inference Algorithm for Low-level Vision.
  - Application of hierarchical A* search algorithm to problem of estimating the boundaries of convex objects in grayscale images.
- Summer 2009: Computer Vision Research Intern, FlashFoto Inc. Human face and facial parts detection and segmentation
  - Implemented a general framework for real-time object detection. Face pose estimation and refinement.
- Feb 2008 - Apr 2008: Collaborative research, Toyota Institute Research Lab, Nagoya, Japan.
  - Research Project on Autonomous Vehicle Navigation. Implemented and tested my algorithms of stereo vision and SfM on the Fujitsu HOAP 3 humanoid robot, and on a road-driving simulation system.
- Summer 2005&2006: Research associate, Institute of Information Technology, Hanoi, Vietnam.
  - Research Project on Vietnamese Optical Character Recognition. (with Prof. Bach Hung Khang and Prof. Luong Chi Mai)

Publications

- H. Trinh, Q. Fan, P. Gabbur, S. Pankanti. ***Hand Tracking by Binary Quadratic Programming and Its Application to Retail Activity Recognition***. Accepted to IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2012.
- H. Trinh, S. Pankanti, Q. Fan. ***Multimodal Ranking for Non-Compliance Detection in Retail Surveillance*****.** IEEE Workshop on the Applications of Computer Vision (WACV), 2012. *(full oral, acceptance rate 8%)*
- H. Trinh, Y. Li, N. Haas, C. Otto, S. Pankanti. ***Enhanced Rail Component Detection and Consolidation for Rail Track Inspection***. IEEE Workshop on the Applications of Computer Vision (WACV), 2012
- H. Trinh, S. Pankanti, Q. Fan. ***Learning-based Approaches to Enhancing Checkout Non-Compliance Detection*****.** Sixth Annual Machine Learning Symposium, The New York Academy of Sciences, 2011.
- With S. Pankanti, et. al. ***Practical computer vision: Example techniques and challenges.*** IBM Journal of Research and Development, 2011.
- P. Gabbur, S. Pankanti, H. Trinh, Q. Fan. ***A Pattern Discovery Approach to Retail Fraud Detection*****.** ACM SIGKDD Conference 2011.
- H. Trinh, Q. Fan, S. Pankanti et al. ***Detecting Human Activities in Retail Surveillance Using Hierarchical Finite State Machine.*** International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2011.
- J. Pan, Q. Fan, S. Pankanti, H. Trinh et al. ***Soft Margin Keyframe Comparison: Enhancing Precision of Fraud Detection in Retail Surveillance*****.** IEEE Workshop on Applications of Computer Vision (WACV) 2011.
- H. Trinh, S. Pankanti, Q. Fan. ***Ensuring Visual Compliance in Retail Using Video Analytics.*** IBM's Fourth Annual Technical Exchange Conference, 2010. Best poster award.
- ***A Machine Learning Approach to Recovery of Scene Geometry from Images***. PhD Thesis, July 2010.
- H. Trinh, D. McAllester. ***Structure and Motion from Road-Driving Stereo Sequences*****.** IEEE Workshop on 3D Information Extraction for Video Analysis and Mining - CVPR 2010.
- H. Trinh, D. McAllester. ***Unsupervised Learning of Stereo Vision with Monocular Depth Cues***. In British Machine Vision Conference (BMVC) 2009.
- H. Trinh. ***Efficient Stereo Algorithm using Multiscale Belief Propagation on Segmented Images***. In British Machine Vision Conference (BMVC) 2008.
- H. Trinh, D. McAllester. ***Particle-based Belief Propagation for Structure from Motion and Dense Stereo Vision with unknown camera constraints***. In Proc. 2nd Robot Vision Workshop, Proceedings. LNCS 4931 Springer 2008, ISBN 978-3-540-78156-1.
- D. McAllester, A. Ihler, H. Trinh. ***Particle Belief Propagation***. Unpublished Manuscripts.
- 2 papers submitted to ICPR 2012.

Patents

- *System and Method for Efficiently Summarizing Salient Events in Unmanned Aerial Videos.* Co-inventor with Sharathchandra Pankanti, Quanfu fan. Under evaluation.
- *System and Method for Location Determination for Railroad Track Inspection.* Co-inventor with Norman Haas, Sharathchandra Pankanti, Ying Li, Charles Otto, Yuichi Fujiki. US Patent pending, 2011.
- *Combining Multiple Modalities for False Alarm Reduction in Retail Fraudulent Event Detection.* Co-inventor with Sharathchandra Pankanti, Quanfu Fan. US Patent pending, 2011.
- *Visual Content-Aware Automatic Camera Adjustment for Optimal Performance of Video Analytics Systems.* Co-inventor with Sharathchandra Pankanti, Quanfu Fan, Prasad Gabbur. US Patent pending, 2011.
- *A Pattern Discovery Approach to Sweethearting in Retail Stores.* Co-inventor with Prasad Gabbur, Sharathchandra Pankanti, Quanfu Fan. US Patent pending, 2011.
- *Evidence Integration for Object Detection Optimization in Rail Inspection.* Co-inventor with Sharathchandra Pankanti, Norman Haas, Ying Li, Charles Otto. US Patent pending, 2011.
- *A Shadow Elimination Method for Cameras Moving In a Straight Line Over Relatively Flat Terrain.* Co-inventor with Norman Haas, Sharathchandra Pankanti, Ying Li. Under evaluation.
- *Automatic Checkout Lane Co-ordination: Balancing the Checkout Load Between Lanes in Retail Stores.* Co-inventor with Sharathchandra Pankanti, Quanfu Fan, Prasad Gabbur. Under evaluation.
- *Efficient Example-based Automatic Configuration in Retail Surveillance using Lane Image Registration.* Co-inventor with Sharathchandra Pankanti, Quanfu Fan, Prasad Gabbur. Under evaluation.
- *Enhancing Precision of Fraud Detection in Retail Surveillance by Soft Margin Keyframe Comparison.* Co-inventor with Jiyan Pan, Sharathchandra Pankanti, Quanfu Fan, Prasad Gabbur. Under evaluation.
- *Human Activities Detection in Retail Surveillance using Hierarchical Finite State Machine.* Co-inventor with Quanfu Fan, Sharathchandra Pankanti, Prasad Gabbur. Under evaluation.
- *Robust Hand Tracking in Retail Surveillance by Integer Programming.* Co-inventor with Quanfu Fan, Sharathchandra Pankanti, Prasad Gabbur. Under evaluation,

Awards and Honors

- Best Poster Award, IBM East Fishkill's Fourth Annual Technical Exchange Conference, 2010.
- Graduate scholarship, Toyota Technological Institute at Chicago/University of Chicago, 2004 – 2010.
- Vietnam Education Foundation Fellowship - Awarded to top 50 students selected from all students in Vietnam. 2004 – 2010.
- AUPELF undergraduate scholarship, Francophone University Agency - Awarded to top students selected from all students admitted to HUT. 1997 – 2002.
- Vietnamese Government Undergraduate Scholarship due to excellent academic results. 1997 – 2002.

Education

Toyota Technological Institute at Chicago/University of Chicago, Chicago, IL:

- June 2010: Ph.D. in Computer Science. Research Interest: *Computer Vision and Pattern Recognition, Machine Learning, AI, Robotics.*
- June 2006: M.S. in Computer Science. GPA: 3.82/4.0.

Hanoi University of Technology (HUT), Hanoi, Vietnam:

- May 2002: B.Sc. in Computer Science. Top 5% of all CS students.

Work History

- Jun 2010 – present: Postdoctoral Researcher, IBM Research at T. J. Watson Center.
- May 2009 – Sep 2009: Computer Vision Research Intern, FlashFoto Inc.
- Jul 2002 - Jul 2004: Full-time GIS Software Engineer, Intergraph Co [V] (a worldwide provider of technical solutions, systems integration, and services), Hanoi, Vietnam.
    - Designed and implemented the Provincial Land Information System for District 5, Ho Chi Minh City.
    - Team member of the Battlefield Information Management System (for Vietnam Navy).
    - Team member of the Hanoi Infrastructure and Transportation Information Management System.
    - Provided training services for customers.
- Oct 2001 – Mar 2002: Application Developer, MISA Software Company. Business Accounting Software Development.
- 2007 - 2009: Web Master, Literature Online Bibliography, University of Chicago Library.

Computer Skills

- *Programming language:* C/C++, MatLab.
- *Web programming and developing:* PHP, ASP, VB Script, Java Script, FrontPage, DreamWeaver MX, Flash MX.
- *Library:* STL, Boost, Open CV, Gtk/Glib, Open GL, GSL, ADOL-C, ffmpeg.
- *Database:* Oracle, MySQL, MS SQL server, MS Access.

Other Activities

- Program co-chair, The Second Greater New York Area Multimedia and Vision Meeting.
- Co-organizer, Special Session on “Retail Video Analytics”, ICIP 2012.
- Reviewer, IJCV, CVPR, ICME, ICIP, Trans on Pattern Recognition, Trans on Image Processing, TCSVT, ICRA.
- Committee member, VEFFA Scientific Award, 2012.
- Session chair, 2nd Robot Vision Workshop, 2008, Auckland, New Zealand.
- Member of IEEE, BMVA.

Personal Data

- French ability: graduated from a 5-year French-speaking undergraduate programs.
- Interests: soccer, tennis, traveling, music, movies.

References

Available upon request.