

Alireza Tavakkoli

Ph.D. Candidate and Research Assistant
Department of Computer Science and Engineering (MS171)
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EDUCATION:

Jan. 2005 – Present: University of Nevada, Reno, Nevada (USA)

Ph.D. Student in Computer Science, Department of Computer Science and Engineering
Advisor: Dr. Mircea Nicolescu
GPA: 4.0

Jan. 2005 – Dec. 2006: University of Nevada, Reno, Nevada (USA)

M.Sc. in Computer Science, Department of Computer Science and Engineering
Advisor: Dr. Mircea Nicolescu
GPA: 4.0

Sep. 2001 – Feb. 2004: Sharif University of Technology, Tehran (IRAN)

M.Sc. in Digital Electronics, Department of Electrical Engineering
Advisors: Dr. Shohreh Kasaei and Dr. Esmail Sanaei
GPA: 3.73

Sep. 1996 – Sep. 2001: Sharif University of Technology, Tehran (IRAN)

B.Sc. in Electronics, Department of Electrical Engineering
Advisors: Dr. Bijan Vosoughi Vahdat
GPA: 3.18

Sep. '92–Sep. '96: National Organization for Development of Exceptional Talents, Kerman (IRAN)

Diploma in Mathematics and Physics
GPA: 3.92

RESEARCH INTERESTS

- Visual Intent Recognition and Understanding
- Human Activity Recognition and Visual Surveillance
- Computer Vision
- Machine Learning Theory
- Machine Intelligence and Evolutionary Computing
- Digital Image, Video and Multimedia Processing
- Biometrics and Identification Systems
- Microprocessor Design and Architecture and Special Purpose DSP
- Parallel Processing

RESEARCH ACTIVITIES

Jan. 2005 – Present: University of Nevada, Reno, Nevada (USA)

Research Assistant:

- Understanding of Intent in Video Surveillance Applications
- Human Activity Recognition
- Automatic Background Modeling for Target Tracking and Visual Surveillance Applications

Sep. 2001 – Feb. 2004: *Sharif University of Technology, Tehran (IRAN)*

Research Assistant:

- Content-based Video Compression
- Object Segmentation for Video Object Plane Extraction in Videos (M.Sc. Thesis)
- Video Coding and Compression (M.Sc. Thesis)
- Optimization of Enhancement Block in Automatic Fingerprint Identification System
- Survey of Neural Network Pattern Recognition
- Designing an Microprocessor with Altera FPGA (B.Sc. Project)

TEACHING ACTIVITIES

Sep. 2003 – Feb. 2004: *Sharif University of Technology, Tehran (IRAN)*

Teaching Assistant:

- Advanced Digital Image Processing, Dr. S. Kasaei, Department of Computer Engineering

Feb. 2001 - Feb. 2003: *Sharif University of Technology, Tehran (IRAN)*

Teaching Assistant:

- Computer Structure and Machine Languages, Dr. E. Sanaei, Department of Electrical Engineering

May 2002 - Sep. 2002: *Sharif University of Technology, Tehran (IRAN)*

Tutor:

- Electronics laboratory, Dr. M. Alavi, Department of Electrical Engineering

PROFESSIONAL ACTIVITIES

Jan. 04 - Aug. 04: *Eimaa Telecommunication Incorporation, Tehran (IRAN)*

Software Engineer and System Designer:

- Design and Implementation of Trans-coder Modules for MMS Systems
- Working on 3gpp File Format Libraries
- Member of Signal Processing team at Eimaa Inc.

Jan. 02-Sep. 03: *Sharif University of Technology, Tehran (IRAN)*

Joint Work with SUT Research Administration:

- Designing an Operational Fingerprint Identification System

May 99 - Sep. 99: *National Regional Electrical Company, Kerman (IRAN)*

Summer intern:

- Configuring and Designing a Network of ION Digital Counters for Industrial Power Measurement

HONORS AND AWARDS

- Outstanding International Graduate Student Award, University of Nevada, Reno (2007, 2008)
- Nevada NSF EPSCoR Graduate Research Fellowship in Cognitive Information Processing, University of Nevada, Reno (Aug. 2007 – Aug. 2008)
- Nevada NSF EPSCoR Graduate Research Fellowship in Cognitive Information Processing, University of Nevada, Reno (Aug. 2006 - Aug. 2007)
- Ranked 3rd among Electronics M.Sc. Students in EE Dept. at Sharif Univ. of Tech (2004)
- Merit-based scholarship, Sharif University of Technology, Tehran (IRAN) (2003)
- Ranked 40 among 4000 competitors in the M.Sc. entrance examination (2001)

- Ranked 90 among 500000 competitors in the B.Sc. entrance examination (1996)
- Ranked 2nd among 500000 students in National Diploma Examination (1996)

MEMBERSHIPS

2005 – Present:

- Institute of Electrical and Electronic Engineers (IEEE)
- IEEE Computer Society

PUBLICATIONS

Journal Articles:

- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, Monica Nicolescu, “**Non-parametric Statistical Background Modeling for Efficient Foreground Region Detection**”, *International Journal of Machine Vision and Applications*, Accepted: February 25th, 2008.
- Richard Kelley, Christopher King, Alireza Tavakkoli, Mircea Nicolescu, Monica Nicolescu, George Bebis, “**An Architecture for Understanding Intent using Novel Hidden Markov Formulation**”, Special Issue on Cognitive Humanoid Robots, *International Journal of Humanoid Robotics*, Accepted: December 29th, 2007.
- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, Monica Nicolescu, “**A Support Vector Data Description Approach for Background Modeling in Videos with Quasi-Stationary Backgrounds**”, *International Journal of Artificial Intelligence Tools*, Accepted: December 10th, 2007.

Conference Papers:

- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, Monica Nicolescu, “**Incremental SVDD Training: Improving Efficiency of Background Modeling**”, to appear in *IASTED Signal and Image Processing Conference*, Kona, Hawaii, USA, August 2008.
- Richard Kelly, Alireza Tavakkoli, Christopher King, Mircea Nicolescu, Monica Nicolescu, George Bebis, “**Understanding Human Intentions via Hidden Markov Models in Autonomous Mobile Robots**”, in the proceedings of the 3rd ACM/IEEE International Conference on Human-Robot Interaction, Amsterdam, Netherland, March 2008.
- Alireza Tavakkoli, Amol Ambardekar, Mircea Nicolescu, Sushil Louis, “**A Genetic Approach to Training Support Vector Dada Descriptors for Background Modeling in Video Data**”, in the *Proceedings of the 3rd International Symposium on Visual Computing*, Lake Tahoe, Nevada, November 2007.
- Alireza Tavakkoli, Richard Kelly, Christopher King, Mircea Nicolescu, Monica Nicolescu, George Bebis, “**A Vision-Based Approach for Intent Recognition**”, in the *Proceedings of the 3rd International Symposium on Visual Computing*, Lake Tahoe, Nevada, November 2007.
- Gholamreza Amayeh, Shohreh Kasaei, George Bebis, Alireza Tavakkoli, Konstantinos Veropoulos, “**Improvements of Zernike Moment Descriptors on Affine Transformed Shapes**”, *International Symposium on Signal Processing and its Applications (ISSPA07)*, United Arab Emirates, February 12-15, 2007.
- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, “**A Novelty Detection Approach for Foreground Region Detection in Videos with Quasi-stationary Backgrounds**”, *Proceedings of the 2nd International Symposium on Visual Computing*, pp. 40-49, Lake Tahoe, NV, November 2006.
- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, “**Robust Recursive Learning for Foreground Region Detection in Videos with Quasi-Stationary Backgrounds**”, *Proceedings of the 18th International Conference on Pattern Recognition*, pp. 315-318, Hong Kong, August 2006.
- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, “**An Adaptive Recursive Learning Technique for Robust Foreground Object Detection**”, to appear in the *Proceedings of the International Workshop on Statistical Methods in Multi-image and Video Processing* (in conjunction with the *European Conference on Computer Vision*), Graz, Austria, May 2006.
- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, “**Automatic Statistical Object Detection for Visual Surveillance**”, *Proceedings of the IEEE Southwest Symposium on Image Analysis and Interpretation*, pp. 144-148, Denver, Colorado, March 2006.

- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, “**Automatic Robust Background Modeling Using Multivariate Non-Parametric Kernel Density Estimation for Visual Surveillance**”, *Proceedings of the 1st International Symposium on Visual Computing*(LNCS vol. 3804), pp. 363-370, Lake Tahoe, NV, December 2005.
- Alireza Tavakkoli, Gholamreza Amayeh and Shohreh Kasaei, “**A Fast VOP Extraction Technique Based on Wavelet and Watershed Segmentation**”, *Proceedings of 12th Iranian Conference on Electrical Engineering*, Mashhad (IRAN), May 2004.
- Alireza Tavakkoli, Shohreh Kasaei and Gholamreza Amayeh, “**A Fast and Efficient Video Object Plane Extraction Method based on Watershed Segmentation**”, *International Workshop on Computer Vision*, Tehran (IRAN), April 2004.
- G. Amayeh, S. Kasaei and A. Tavakkoli, “**A modified algorithm to obtain translation, rotation and scale invariant Zernike moment shape descriptors**”, *International Workshop on Computer Vision*, Tehran (IRAN), April 2004.
- S. Kasaei, G. Amayeh and A. Tavakkoli, “**Fingerprint Authentication**”, *Proceedings, Sharif University of Technology*, Tehran (IRAN), 2003.

Invited Talks and Posters:

- Alireza Tavakkoli, “**Background Modeling Techniques in Videos for Visual Surveillance Applications**”, CS-791E (Computer Vision), University of Nevada, Reno.
- Alireza Tavakkoli, Mircea Nicolescu, George Bebis, “**Recursive Background Learning for Visual Surveillance Applications**”, Cognitive Information Processing EPSCoR State Conference, Reno, Nevada, May 22nd-24th, 2006.

SYNERGETIC ACTIVITIES

- Participated in organizing the third International Symposium on Visual Computing (ISVC'07), Lake Tahoe, NV, November 2007.
- Participated in organizing the second International Symposium on Visual Computing (ISVC'06), Lake Tahoe, NV, November 2006.
- Volunteer for College of Engineering incoming freshman advisement, University of Nevada, Reno, April 2006.
- Volunteer for Engineer's day event, University of Nevada, Reno, February 2006.
- Participated in organizing the first International Symposium on Visual Computing (ISVC'05), Lake Tahoe, NV, December 2005.
- Reviewing:
 - 13th International Computer Society of Iran Computer Conference (CSICC'08), March 2008.
 - 3rd International Signal-Image Technologies and Internet-Based Systems, December 2007.
 - 2nd International Symposium on Visual Computing, November 2006.
 - IEEE Transactions on Pattern Analysis and Machine Intelligence, 2006.
 - IEEE Workshop on Object Tracking and Classification in and Beyond the Visible
 - Spectrum (in conjunction with CVPR), New York, June 2006.
 - International Conference on Pattern Recognition, Hong Kong, August 2006.

TECHNICAL REPORTS

Dec. 2006: M. Sc. Thesis

- Alireza Tavakkoli, “**Segmentation for Videos with Quasi-Stationary Backgrounds - A Non- Parametric Approach**”, *M.Sc. Thesis, Department of Computer Science and Engineering, University of Nevada, Reno, NV (USA)* GPA: 4.0
Supervisor: Dr. M. Nicolescu

Sep. 2001-Feb. 2004: M.Sc. Thesis

- Alireza Tavakkoli, “**Content Based Video Compression with Application to Distance Learning**”, *M.Sc. Thesis, Department of Electrical Engineering, Sharif University of Technology, Tehran (IRAN)*
Grade: **A (18.5/20.0)**.
Supervisors: Dr. S. Kasaei and Dr. E. Sanaei

Apr. 2001-Sep. 2001: B.Sc. Senior Project

- Alireza Tavakkoli, “**Designing a Microprocessor with FPGA**”, B.Sc. Thesis, Department of Electrical Eng., Sharif University of Technology, Tehran, IRAN, Grade: **A (19.0/20.0)**.
Supervisor: Dr. B. Vosoughi Vahdat.

SPECIAL SKILLS**Languages:**

- Persian (Native Language).
- English (Fluent).
- Arabic (Basic Knowledge of).

Simulation Software:

- OpenCV
- Microsoft Windows and Linux Programming.
- Matlab, C++ and Visual C++ (OOP), KDevelop Programming, ASP + SQL Server and Java Programming, Pascal and Delphi Programming, MaxPlus2, PSPICE, and Orcad.

Microprocessor Skills:

- Z80 and 8080/8086 machine language, 80x86 system programming.

SPECIAL INTEREST COURSES

Course	Level	Grade
Mathematical Methods in Computer Vision	Grad	A
Advanced Computer Vision	Grad	A
Computer Vision	Grad	A
Biometrics	Grad	A
Pattern Recognition	Grad	A
Machine Intelligence	Grad	A
Automata and Formal Languages	Grad	A
Analysis of Algorithms	Grad	A
Principles of Operating Systems	Grad	A
Evolutionary Computing	Grad	A
Fuzzy Logic	Grad	A
Digital Image Processing	Grad	17.0/20.0
Digital Signal Processing	Grad	19.5/20.0
Digital Signal Processors	Grad	18.0/20.0
Neural Networks	Grad	19.0/20.0
Computer Interfacing	Grad	17.0/20.0
Internet Programming	Grad	17.5/20.0
Signals and Systems	Under Grad	17.5/20.0

REFERENCES AND COLABORATORS**1. Dr. Mircea Nicolescu (Ph.D. Advisor)**

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2. Dr. George Bebis (CVL Director)

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3. Dr. Monica Nicolescu (Fellowship Co-advisor)

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4. Dr. M. Sami Fadali (Fellowship Co-advisor)

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University of Nevada, Reno, Nevada USA 89557

5. Dr. Shohreh Kasaei (M.Sc. Thesis Advisor)

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URL : <http://sharif.edu/~skasaei>
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Sharif University of Technology,
Po. Box: 11365-9517, Tehran, IRAN.

6. Dr. Esmail Sanaei (M.Sc. Thesis Advisor)

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URL : <http://sharif.edu/~sanaei>
Address : No 20, 19th st., Bucharest Ave., Argentina Square,
Po. Box: 15875-5833, Tehran, IRAN.

7. Dr. Bijan Vosoughi Vahdat (B.Sc. Project Advisor)

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Po. Box: 11365-9363, Tehran, IRAN.