

Hossein Mobahi

Curriculum Vitæ

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University of Illinois at Urbana-Champaign
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Research Interests

- **Computer Vision** : Object Recognition, Image Segmentation, Image Compression, Image Inpainting.
- **Machine Learning** : Pattern Recognition, Data Clustering, Manifold Learning.

Education

- 2005–now Ph.D. Candidate in Computer Science
University of Illinois at Urbana Champaign
Advised by Professor **Karrie Karahalios** since **2005-2007**
Advised by Professor **Yi Ma** (ECE Dept.) since **September 2007**
- 2003–2005 M.S. in Computer Science (Area: AI and Robotics)
University of Tehran
GPA 19.29/20.00 (equivalent to 4.0/4.0)
Top graduated (**first rank**) in Faculty of Engineering
Dissertation: *Learning by Concept-Oriented Imitation*
Advisor : Professor Majid Nili Ahmadabadi Coadvisor: Babak Nadjar Araabi
- 1998-2003 B.S. in Computer Engineering
Azad University, Tehran-South Campus
GPA 17.29/20.00
Top graduated (**second rank**) in Department of Computer Engineering
Final Project: *Building an Interactive Robot Face from Scratch*
Advisor : Mr. Masoud Katiraei

Awards and Honors

- 2008–2009 **Mavis Memorial Fund Scholarship Award**
\$5,000 unrestricted fund due to academic performance, research accomplishments, and demonstrated interest in engineering education.
- 2005 **Best Student Paper Award (1st Place) in 5th Symposium of Understanding Complex Systems**
University of Illinois at Urbana-Champaign
Article: *Swarm Contours: An ALife approach to image processing.*
- 2004 **IEEE Student Branch Award for Outstanding Extracurricular Activities**
University of Tehran
Teaching summer course on *Computer Vision and Pattern Recognition.*

- 2003 **Young Inventor Award in the National Khwarizmi Festival**
Receiving certificate from ministry of "science, research and technology"
Project Title: *An Interactive Emotional Robotic Face*
- 2002 **Best Paper Award in the 5th Student Computer Conference of Iran**
Article: *Composite Radial Function for 2D Shape Representation*
- 2002 **14th rank in the nationwide entrance examination of graduate schools in Computer Science**
About 3,000 Iranian students competed in computer science and engineering.
- 2001 **Awarded by Research Office for Outstanding Extracurricular Activities**
Azad University, Tehran, Iran.
- 1999-2001 **Three Successive Years Chosen Member of the University Team in the International Collegiate Programming Contest by ACM**
Received ACM's certificate of achievement. Azad University, Tehran, Iran.
- 1993 **First Rank in Computer Programming Contest held among All Tehran High Schools.**
Received Certificate from *Chief of Ministry of Education*.

Research Experience

- 2009–present **Image Segmentation using Minimum Coding Length.**
supervisor Prof. *Yi Ma*, University of Illinois at Urbana-Champaign.
- 2007–2009 **Sparse Signal Representation for Pattern Recognition.**
supervisor Prof. *Yi Ma*, University of Illinois at Urbana-Champaign.
- 2007 **Speech Visualization by Analysis of Phase Diagrams.**
supervisor Prof. *Karrie Karahalios*, University of Illinois at Urbana-Champaign.
- 2006–2007 **Video Retrieval System for studying Human Social Behavior (GroupScope Project).**
supervisor Prof. *Klara Nahrstedt*, University of Illinois at Urbana-Champaign.
- 2005–2006 **HCI techniques for aiding children with Autism.**
supervisor Prof. *Thomas S. Huang and Karrie Karahalios*, University of Illinois at Urbana-Champaign.
- 2005 **Tracking Bees in Low-Quality Gray-Scale Video.**
supervisor Prof. *David A. Forsyth*, University of Illinois at Urbana-Champaign.
- 2003–2004 **Learning by Imitation.**
supervisor Prof. *Majid Nili Ahmadabadi*, Institute for Studies in Theoretical Physics and Mathematics (IPM), School of Cognitive Sciences (SCS), Tehran, Iran.
- 2002–2003 **Vision based passenger counting.**
supervisor Prof. *Majid Nili Ahmadabadi*, Minoosoft Corp, Tehran, Iran.
- 2001–2002 **Tracking Activation Profiles in Functional MRI Images.**
supervisor Prof. *Sven Dickinson*, University of Toronto and Rutgers University.

2000–2001 **Persian Text To Speech (TTS) System.**
supervisor Prof. *Shahin Rouhani*, Institute for Studies in Theoretical Physics and Mathematics (IPM), School of Intelligent Systems (SIS), Tehran, Iran.

1999–2000 **Automatic Fingerprint Recognition.**
supervisor Prof. *Shahin Rouhani*, Institute for Studies in Theoretical Physics and Mathematics (IPM), School of Intelligent Systems (SIS), Tehran, Iran.

Teaching Experience

2005 **Volunteer Teaching for Lecture Series on “Introduction to Pattern Recognition”.**
ACM Student Chapter, University of Illinois at Urbana-Champaign.

2005 **Teaching Assistant for “Introduction to Artificial Intelligence” (CS440-ECE448).**
Taught by Prof. *Jean Ponce*, University of Illinois at Urbana-Champaign.

2003 **Workshop Lecturer, “Stereo Vision and Object Tracking”.**
2nd National Robotic Workshop, ACM Student Chapter, University of Tehran.

2003 **Teaching Summer Course, “Applied Machine Vision”.**
IEEE Student Branch, University of Tehran.

2002 **Teaching Assistant of "Signals & Systems".**
Taught by *Massoud Katiraei*, Azad University, Tehran-South Campus.

2000–2002 **Teaching Assistant of "Artificial Intelligence".**
Taught by *Shahin Seyyed-Mesgari*, Azad University, Tehran-South Campus.

2000–2002 **Teaching Summer Course, "Fundamentals of Computer Vision".**
Institute for studies in theoretical Physics and Mathematics (IPM), School of Intelligent Systems (SIS).

Internships

Summer 2008 **NEC Laboratories of America**, Princeton, New Jersey.
Project: Exploiting temporal coherence in video for learning.
Supervisor: Dr. Jason Weston

Publications

Journal Papers

- [1] **A Biologically Inspired Method for Conceptual Imitation using Reinforcement Learning.**
Mobahi, H., Nili Ahmadabadi, M., Nadjar Araabi, B.
Journal of Applied Artificial Intelligence Vol. 21, No. 3, pp. 155-183, Taylor & Francis Group, Mar. 2007.
- [2] **Swarm Contours: A fast self-organization approach for snake initialization.**
Mobahi, H., Nili Ahmadabadi, M., Nadjar Araabi, B.
Complexity, Vol 12, Issue 1, pp. 41-52, John Wiley & Sons Inc, Oct. 2006.

- [3] **Vision based Fruit Inspection using Independent Component Analysis.**
Mobahi, H., Nadjar Araabi, B.
Journal of AIEEE (Iranian Association of Electrical and Electronics Engineers), To appear.
- [4] **Fuzzy Behaviors for an Emotional Interactive and Emotional Robot Face.**
Mobahi, H., Lucas, C.
WSEAS Transactions on Systems (M. Mladenov, Ed.), Issue 4, Volume 2, pp. 1111-1117, October 2003.

Referred Conference Papers

- [5] **Swarm Contours: An ALife approach to image processing.**
Mobahi, H., Nili Ahmadabadi, M., Nadjar Araabi, B.
5th Symposium of Understanding Complex Systems, University of Illinois at Urbana-Champaign, May (2005).
- [6] **Concept Oriented Imitation.**
Mobahi, H., Nili Ahmadabadi, M., Nadjar Araabi, B.
Proceedings of IEEE International Conference on Robotics and Automation (ICRA05), pp. 1495-1500, Spain, April 2005.
- [7] **Fast initialization of active contours: towards practical visual interfaces for human-robot interaction.**
Mobahi, H., Ahmadabadi, M.N.; Araabi, B.N.
Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2004), pp. 546-551, Japan, October 2004.
- [8] **Temporal Resolution in Coevolutionary Optimization.**
Mobahi, H., Lucas, C.
Workshop on Applied Optimization (WAO 2004), Institute for Numerical Mathematics Technische Universitat Dresden, Germany, October 2004.
- [9] **Peak Stick RBF Network for Online System Identification.**
Mobahi, H., Sharifi-Janabi, F.
Proceedings of the International Joint Conference on Neural Networks (IJCNN04), pp. 2105-2111, Budapest, Hungary, July 2004.
- [10] **Fuzzy Perception, Emotion and Expression for Interactive Robots.**
Mobahi, H., Ansari, S.
Proceedings of IEEE International Conference on Systems, Man and Cybernetic (SMCC03), Volume 4, pp. 3918-3923, Washington, D.C., USA, Oct. 2003.
- [11] **Shape Representation.**
Mobahi, H.
1st International Seminar on Graphs, Combinatorics and Computational Algorithms, Amir Kabir University, Tehran, Iran, Feb. 2001.

Magazines

- [12] **HCI Applications for Aiding Children with Mental Disorders.**
Mobahi, H., Karahalios, K. G.
ACM Crossroads, Special Issue on Human-Computer Interaction, Issue 12.2, Winter 2005, pp. 8-12.

Older Conferences Papers in Iran

- [13] **A Comparative Study on Geometric and Holistic Representations for Facial Expression Recognition.**
Mobahi, H., Nadjar Araabi, B.
Proceedings of 3rd Iranian Conf. Machine Vision and Image Processing (MVIP05), Tehran, Iran, pp. 632-637, February 2005.
- [14] **Vision Based Fruit Inspection Using Independent Component Analysis.**
Mobahi, H., Nadjar Araabi, B.
Proceedings of 3rd Iranian Conf. Machine Vision and Image Processing (MVIP05), Tehran, Iran, pp. 654-657, February 2005.
- [15] **Concept-Oriented Imitation.**
Mobahi, H., Nili-Ahmadabadi, N., Nadjar Araabi, B.
10th Iranian Computer Conference by Computer Society of Iran, Tehran, Iran, February 2005.
- [16] **Detecting Face And Facial Features Using Neural Networks.**
Mobahi, H.
5th National Student Computer Conference of Iran, Iran University of Science and Technology, Tehran, Iran, May 2002.
- [17] **Composite Radial Function For 2D Shape Representation.**
Mobahi, H.
5th National Student Computer Conference of Iran, Iran University of Science and Technology, Tehran, Iran, May 2002.
* Received Best Paper Award
- [18] **A Fast Face and Hand Detection Method.**
Mobahi, H.
4th National Student Conference on Intelligent Systems, Khajeh-Nasir University, Tehran, Iran, March 2002.
- [19] **Evolutionary Construction of Asynchronous Logic Design**
Mobahi, H.
4th National Student Conference on Intelligent Systems, Khajeh-Nasir University, Tehran, Iran, March 2002.
- [20] **A Novel Approach for Shape Representation**
Mobahi, H.
4th National Student Conference on Intelligent Systems, Khajeh-Nasir University, Tehran, Iran, March 2002.
- [21] **Shape Representation**
Mobahi, H.
First International Seminar on Graphs, Combinatorics and Computational Algorithms, Amir Kabir University, Tehran, Iran, Feb 2001.
- [22] **A Hack for Correctly Displaying Sprites in Commodore-64**
Mobahi, H.

Electronics and Computer Science Magazine (the oldest computer magazine in Iran), Vol. 8, Page 15, No. 108, July 1989.

* **Earliest Technical Publication (Age 10).**

Media Coverage

- **Channel 3 of Iran's TV:** Talangor Program, Successful Youth Part, an *exclusive interview* with me demonstrating my interactive robot face (Aryan) in action, aired February 2003.

Extracurricular

- 2006 Volunteered for judging *FIRST Lego League Junior Robotics Regional Competition*, University of Illinois at Urbana Champaign.
- 2002–2003 Vice-Chair of *ACM Student Chapter*, ĀAzad University, Tehran-South Campus, Tehran, Iran.
- 2002 Head of the *Research Committee in IEEE Student Branch*, ĀAzad University, Tehran-South Campus, Tehran, Iran.
- 1998 One of the *Founders of Student Computer Association* , ĀAzad University, Tehran-South Campus, Tehran, Iran.
- 1998–2000 Organizer of *Weekly Computer Seminars*, Dept. of Computer and Networks of Institute for studies in theoretical Physics and Mathematics, Tehran, Iran.

Professional Membership

- 2002–2005 Association for Computing Machinery (ACM).
- 2002–2005 Institute of Electrical And Electronics Engineers (IEEE).
- 2001–2004 American Association of Artificial Intelligence (AAAI).
- 2001–2004 Institute For Studies in Cognitive Science of ĀIran.
- 1999–2003 Computer Society of ĀIran.
- 1999–2002 Informatics Society of Iran.

Computer Skills

- **Operating Systems:** Linux, UNIX (FreeBSD), Windows 98/XP, Mac OS.
- **Programming Languages:** C, Assembly (8086 and Z80), Basic.
- **Technical Tools:** Matlab, OpenGL, OpenCV, Torch.

References are available on request.