CURRICULUM VITAE

Assoc. Prof. Nafiz ARICA, Ph.D.

Bahcesehir University
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EDUCATION

PhD. (1998-2003)

Middle East Technical University, Department of Computer Engineering, Ankara, TURKEY

Thesis Title : SHAPE : Representation, Description, Similarity, Recognition
Advisor : Fatoş T. Yarman-Vural

- Developed a novel shape representation and description method, called Beam Angle Statistics
- Proposed a new similarity measure and Hidden Markov Model topology based on BAS features

M.S. (1995-1998)

Middle East Technical University, Department of Computer Engineering, Ankara, TURKEY

Thesis Title : Off-Line Handwritten Character Recognition
Advisor : Fatoş T. Yarman-Vural

- Developed a new scheme for off-line handwritten connected character recognition problem, which uses a sequence of segmentation and recognition algorithms

B.S. (1987-1991)

Naval Academy, Department of Computer Engineering, Istanbul, TURKEY

RESEARCH EXPERIENCE

University of Illinois at Urbana Champaign, Urbana, IL, USA
Beckman Institute for Advanced Science and Engineering

Postdoctoral Research Associates (February 2006- April 2007)

Worked with Prof. Narendra Ahuja and conducted research on

- Learning based Visual Attention
- Perceptual Grouping
- Hierarchical Image Segmentation
- Object Detection and Categorization

Naval Postgraduate School, Monterey, CA, USA
Department of Information Sciences

Visiting Scholar, (December 2007 – July 2008)

- Conducted research on Command Control Communications Computers and Intelligence (C4I) Systems
- Non-degree Education in Command Control Communications Computers and Intelligence (C4I) Systems Program

Naval Academy, Department of Computer Engineering **Istanbul, TURKEY**

Faculty Member (August 2004 - present)

- Current research projects
  - 3-D Spatial Layout Extraction of Indoor Images
  - Human Activity Analysis
  - Search Approaches for Real-Time Situated Agents
  - Attribute Based Object Categorization
  - Scene Representation and Classification
  - Object Tracking and Analysis in Aerial Videos

- Completed research projects
  - Modeling and Simulation of Unmanned Aerial Vehicle Flight Paths
  - Image Steganography
  - Affine Invariant Interest Region Detection
  - Audio Signal Classification
  - Underwater Acoustic Signal Recognition
  - Scene Classification
  - Cyclic sequence comparison

- Participated in the following projects for Naval Forces
  - Identification System for Electronic Warfare
  - Geographical Information System for Operations Center in Navy Headquarter

Middle East Technical University, Department of Computer Engineering, **Ankara, TURKEY**

Researcher (September 1996 - July 2003)

- Member of the Image Processing and Pattern Recognition Group
- Participated into the following projects during his PhD study:
  - Content-Based Image and Document Description, supported by NSF-USA
  - Optical Character Recognition for Ottoman Script, supported by Turkish National Council of Research
  - Historical Newspaper Database System, supported by State Planning Organization

University of Rochester, Dept. of Electrical and Computer Eng. **Rochester, NY, USA**

Visiting Researcher (July-August 1998 and July-August 2000) Joint NSF project with Prof. Murat Tekalp and Prof. Fatos Yarman-Vural.

- Worked on content based image retrieval systems.
- Developed an object detection and representation system in image database.

PROFESSIONAL EXPERIENCE

Bahcesehir University, Software Engineering Department **Istanbul, TURKEY**

Faculty (Assoc.Prof.) (September 2013 – Present)

Naval Academy, Department of Computer Engineering **Istanbul, TURKEY**

Department Chair (August 2007 – August 2013)
Program Coordinator of C4I Graduate Program (September 2009 – August 2103)
Erasmus Coordinator (August 2007 – February 2008)

Middle East Technical University, Department of Computer Engineering, **Ankara, TURKEY**

Part-time Faculty (September 2003-July 2004)

Turkish Navy Headquarter CIS Division **Ankara, TURKEY**

Branch Head, Information Systems Project and Planning Officer (December 2003-August 2004)

- Planning and budgeting Navy information systems' procurement,
- Guiding the HQ activities from the information systems standpoint.

Project Officer, Information Systems Project and Planning (June 2003-December 2003)

- Procuring information systems
- Representing the Navy at NATO Maritime Command Control Information System (MCCIS) Life Cycle Working Group meetings

Database Management Systems Administrator (March 2002-June 2003)

- Administrating Database Systems for both intranet and internet
- Determining, executing and monitoring information systems security policies

Software Development Team Manager (June 2000-March 2002)

- Working on the management of project OMEGA, a large-scale software development aimed at producing a strategic C^3 system for the Navy
- Developing the Geographic Information Systems (GIS) of the project OMEGA

System Administrator, (September 1998-June 2000)

- Operating HQ LAN and Naval WAN, as well as NATO information systems
- Administrating web for both intranet and internet

PUBLICATIONS

Journals (SCI-Expanded)

1. Nafiz Arıca, Ömer Kurtuldu, "Image Steganography By Wavelet Matching", Journal of Electronic Imaging, vol.18,no.3, 033013, 2009.

2. Nafiz Arıca, Fatoş Yarman-Vural, "BAS : A Perceptual Shape Descriptor Based on the Beam Angle Statistics", Pattern Recognition Letters, Vol. 24, pp.1627-1639, 2003.
3. Nafiz Arıca, Fatoş Yarman-Vural, "Optical Character Recognition For Cursive Handwriting", IEEE Trans. Pattern Analysis and Machine Intelligence, vol. 24, no. 6, pp. 801-813, 2002.
4. Nafiz Arıca, Fatoş Yarman-Vural, "An Overview of Character Recognition Focused on Off-line Handwriting", IEEE Trans. Systems, Man and Cybernetics, Part C: Applications and Reviews, vol.31, no.2, pp.216-232, 2001.
5. Nafiz Arıca, Fatoş Yarman-Vural, "One Dimensional Representation of Two Dimensional Information for HMM Based Handwritten Recognition", Pattern Recognition Letters, vol.21 pp. 583-592, 2000.

   (Lecture Notes in Computer Science) (SCI-Expanded)
6. Nafiz Arıca, "Cyclic Sequence Comparison Using Dynamic Warping", International Conference on Image and Video Retrieval, (CIVR 2005), (also published in Lecture Notes in computer Science, Volume 3568).
7. Nafiz Arıca, Fatoş Yarman-Vural, "Shape Similarity Measurement for Boundary Based Features", International Conference on Image Analysis and Recognition (ICIAR 2005), Toronto, Canada. (also published in Lecture Notes in computer Science Volume 3656, pp. 431-439).
8. Ömer Onder Tola, Nafiz Arıca, Fatoş Yarman-Vural, "Shape Recognition With Generalized Beam Angle Statistics", International Symposium on Computer and Information Sciences, 2004 (also published in Lecture Notes in computer Science, Volume 3280, pp. 391-399).
9. Nafiz Arıca, Fatoş Yarman-Vural, "A Compact Shape descriptor based on the Beam Angle Statistics", International Conference on Image and Video Retrieval, (CIVR 2003), (also published in Lecture Notes in computer Science, Volume 2728 , pp.152-162).
10. Mehmet Ali Ozdil, Fatoş Yarman-Vural, Nafiz Arıca, "Optical Character Recognition Without Segmentation", International Conference Image Analysis and Processing, ICIAP'97, (also published in Lecture Notes on Computer Science, vol.1311, pp. 609-615).

Journal Papers in Preperation (SCI-Expanded)

11. Nafiz Arıca, Aysegul Mut, Alper Yorukcu, "Comparing Search Approaches for Real-Time Situated Agents", Artificial Intelligence Review (Submitted)
12. Halil Cicibaş, K. Alpaslan Demir, Nafiz Arıca, Murat Gunal, "A Multi-Criteria Path Planning Model and Simulation For Unmanned Aerial Vehicles" IEEE Systems (Submitted).

Other Journals

1. Özhan Güneş, Nafiz Arıca, "Audio Signal Classification", Navy Review, Greece (Accepted)
2. Nafiz Arıca, Halil Cicibaş, K. Alpaslan Demir, "İnsansız Hava Araçları İçin Çok Kriterli Güzergah Planlama Modeli*", The Journal of Defense Sciences,* Vol:11, No:1,pp:251-270, 2012.
3. Murat KÜÇÜKBAYRAK, Özhan GÜNEŞ, Nafiz ARICA, "Underwater Acoustic Signal Recognition Methods", *Journal of Naval Science and Engineering*, Vol:5, No:3, pp:64-79, 2009.
4. Emrah Ergül, Nafiz Arıca, "Scene Classification Using Cascaded Latent Semantic Analysis", *Journal of Naval Science and Engineering,* vol:5 (2), 2009.

5. Mesut Güney, Nafiz Arıca, "Desen Tabanlı İlgi Bölgesi Tespiti", *Journal of Naval Science and Engineering,* vol:5 (1), 2009.
6. Ömer Kurtuldu, Nafiz Arıca, "İmge Kareleri Kullanan Yeni Bir Steganografi Yöntemi", *Journal of Naval Science and Engineering*, vol:5 (1), 2009.

International Conference Proceedings

1. Halil Cicibaş, K. Alpaslan Demir, Murat Gunal, Nafiz Arıca, "A Simulation Model For Analysing Unmanned Aerial Vehicle Flight Paths", 24th *European Modeling & Simulation Symposium(EMSS),* Sept. 19-21, Vienna, Austria, 2012.
2. Emrah Ergül, Nafiz Arıca, "Scene Classification Using Spatial Pyramid of Latent Topics," *20th International Conference on Pattern Recognition (ICPR)*, pp.3603-3606, 2010.
3. Mesut Güney, Nafiz Arıca, "Maximally Stable Texture Regions", *20th International Conference on Pattern Recognition (ICPR)*, pp.4549-4552, 2010.
4. Nafiz Arıca, Ömer Kurtuldu, "A New Steganography Method Using Image Layers", *International Symposium on Computer and Information Sciences ISCIS 21*, 2008.
5. Nafiz Arıca, Fatoş Yarman-Vural, "A Perceptual Shape Descriptor", *International Conference on Pattern Recognition (ICPR)* Quebec, Canada, pp. 375-379, 2002.
6. Nafiz Arıca, Fatoş Yarman-Vural, "A Shape Descriptor Based on Circular Hidden Markov Model", *International Conference on Pattern Recognition (ICPR)* Barcelona, Spain, pp.924-928, 2000.
7. Nafiz Arıca, Fatoş Yarman-Vural, "A New HMM Topology for Shape Recognition", *IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing (NSIP'99)*, Antalya TURKEY, pp. 162-168, 1999.
8. Nafiz Arıca, Fatoş Yarman-Vural, "A New Scheme for Off-Line Handwritten Connected Digit Recognition", *International Conference on Pattern Recognition (ICPR),* Brisbane, Australia, pp.1127-1131, 1998.
9. Nafiz Arıca, Fatoş Yarman-Vural, "One Dimensional Representation Of Two Dimensional Information For HMM Based Handwritten Recognition", *IEEE International Conference on Image Processing (ICIP)* October, Chicago, U.S.A. TP11.05, 1998.
10. Nafiz Arıca, Fatoş Yarman-Vural, "Off-Line Handwritten Connected Character Recognition", International Conference on Intelligent Processing Systems (ICIPS), pp.562-567, 1998.
11. Savas Aygun, Adnan Yazici, Nafiz Arıca, "Conceptual Data Modeling Of Multimedia Database Applications", *IEEE International Workshop on Multimedia Database Management Systems (IW-MMDBMS'98),* Dayton, Ohio, pp.182-189, 1998.
12. Nafiz Arıca, Fatoş Yarman-Vural, "HMM Based Handwritten Recognition", *International Symposium on Computer and Information Sciences ISCIS XII,* pp. 260-266, 1997.

National Conference Proceedings

1. Mehmet Karayel, Nafiz Arıca, "Random Attributes for Image Classification", *IEEE Signal Processing and Communications Applications,* Girne, TRNC 2013 **(IEEE Best paper award 2nd place)**.

2. Çaglar Yapıcılar, Nafiz Arıca, "3D Spatial Layout Extraction of Indoor Images Using RGB-D Data", *IEEE Signal Processing and Communications Applications,* Girne, TRNC 2013.
3. Emrah Ergül, Sarp Ertürk, Nafiz Arıca, "Unsupervised Relative Attribute Extraction", *IEEE Signal Processing and Communications Applications,* Girne, TRNC 2013. (Accepted)
4. Doğa Siyli, Lale Akarun, Nafiz Arıca, "Physiotherapy Guidance by Motion Analysis Based on Hidden Markov Model", IEEE Signal Processing *and Communications Applications,* Girne, TRNC 2013. (Accepted)
5. Aysegul Mut, Alper Yorukcu, Nafiz Arıca, K. Alpaslan Demir, "A Comparison of Stationary Target Search Algorithms in Real Time Situated Agents with Variable Sensor Ranges", *IEEE Signal Processing and Communications Applications (SIU'12),* Fethiye, Turkey, 2012.
6. Halil Cicibaş, K. Alpaslan Demir, Nafiz Arıca, "İnsansız Hava Araçları İçin Modüler Bir Simülasyon Tasarım Örneği", *National Symposium on Software Engineering, (UYMS'2011),* Ankara, Turkey, 2011.
7. Halil Cicibaş, K. Alpaslan Demir, Nafiz Arıca, "İnsansız Hava Araçları İçin Çok Kriterli Güzergah Planlama Modeli*", National Conference on Defence Applications Modelling and Simulation (USMOS'2011),* Ankara, Turkey, 2011.
8. Mithat Dağlar, Özhan Güneş, Nafiz Arıca, "Nitelik Tabanlı Nesne Sınıflandırmada Niteliklerin Olasılıksal ve Üçlü Temsili", *IEEE Signal Processing and Communications Applications (SIU'11),* Antalya, Turkey, 2011.
9. Emrah Ergül, Cemalettin Çiftçi, Nafiz Arıca, "Sahne Sınıflandırılmada Önem Temelli Öznitelik Seçim Yöntemi", *IEEE Signal Processing and Communications Applications (SIU'11),* Antalya, Turkey, 2011.
10. Cemalettin Çiftçi, Emrah Ergül, Nafiz Arıca, "Belirginlik Tabanlı Bölütleme ile Sahne Sınıflandırılması", *IEEE Signal Processing and Communications Applications (SIU'11),* Antalya, Turkey, 2011.
11. Nafiz Arıca, "Çevrimsel Dizi Karşılaştırması İçin Dinamik Zaman Bükmesi", *IEEE Signal Processing and Communications Applications (SIU'05),* Kayseri, Turkey, 2005.
12. Omer Onder Tola, Nafiz Arıca, Fatoş Yarman-Vural, "Genellestirilmis Kerteriz Acilari Istatistikleri ile Sekil Tanima", *IEEE Signal Processing and Communications Applications (SIU'04),* Antalya, Turkey, pp.735-739, 2004.
13. Nafiz Arıca, Fatoş Yarman-Vural, "Tikiz Sekil Betimleyicileri", *IEEE Signal Processing and Communications Applications (SIU'2003)*, Istanbul, Turkey, pp.414-418, 2003.
14. Nafiz Arıca, Fatoş Yarman-Vural, "Kerteriz Tabanlı Şekil Tanımlayıcısı", *IEEE Signal Processing and Communications Applications (SIU'2002),* Pamukkale, Turkey, pp. 2002 **(Best paper award).**
15. Nafiz Arıca, Fatoş Yarman-Vural, "El Yazısı Tanıma Problemi için Bütünsel Parametre Kestirimi ve Bölütleme Algoritmaları", *IEEE Signal Processing and Communications Applications (SIU'2003),* Magosa, pp.261-266, 2001.
16. Nafiz Arıca, Fatoş Yarman-Vural, "Sakli Markov Model ile El Yazisi Tanimada Iki Boyutlu Bilginin Tek Boyutlu Sunumu", *IEEE Signal Processing and Communications Applications (SIU'98),* Ankara, Turkey, pp.48-54, 1998.

17. Nafiz Arıca, Fatoş Yarman-Vural, "Insan Optik Sisteminle Benzetilerek Gelistirilen bir El Yazisi Optik Karakter Tanima Sistemi", *IEEE Signal Processing and Communications Applications (SIU'97),* Kusadasi, Turkey, pp.810-816, 1997.

CITATIONS

Google Scholar Citations

Citations: 666, h-index:9, i10-index:7

Microsoft Academic Search

Citations: 323, g-index:17, h-index:8

RESEARCH PHILOSOPHY

The general theme of my research is to develop intelligent systems with a focus on "seeing". In accordance with this ultimate goal, my research interests include various subjects in Computer Vision, Machine Learning and Autonomous Agents. During my research career, I have worked on many problems that have real-world applications in these areas. In particular, the problems I have addressed in my research covers image/object representation and classification, 3-D image analysis, human activity analysis, detecting and tracking moving objects for video surveillance. In addition I have studied on simulation and modeling of Unmanned Aerial Vehicle (UAV) flight paths, and path planning algorithms.

For my research, I combine the rigor of basic sciences with the innovative and practical aspects of engineering. My general goal in research is to develop novel techniques based on probabilistic models and engineering approaches. I pursue my research based on three pillars: analysis of real world problem, development of computational models and experimentation on large set of real data.

SUPERVISED THESIS

Naval Science and Engineering Institute,

Omer Kurtuldu,	"İmge Steganografisi için Yeni Yöntemler"
Mesut Güney,	"Yüksek Boyutlu İmge Özniteliklerine Dayalı İlgi Bölgesi Tespiti"
Hüseyin Gürsoy,	"Sınır Tabanlı Özel Bölgeler için Şekil Betimleyicisi"
Murat Küçükbayrak,	"Underwater Acoustic Signal Recognition Methods"
Emrah Ergül,	"Scene Classification Using Latent Semanic Topics"
Özhan Güneş,	"Nitelik Tabanlı Nesne Sınıflandırma"
Halil Cicibaş	"Multı-Criteria Path Planning Model And Simulation For Unmanned Aerial Vehıcles"
Ayşegül MUT	"Search Algorithms for Moving Agents"

Middle East Technical University, Computer Engineering Department

Önder O. Tola	"Shape Matching" with Prof. Fatoş Yarman-Vural

CURRENT STUDENTS

October 9, 2013

Recep Doga Siyli	PhD in Bogazici University (with Prof. Lale Akarun)
Emrah Ergul	PhD in Kocaeli University (with Prof. Sarp Erturk)
Mehmet Karayel	MS in Naval Science and Engineering Institute
Caglar Yapicilar	MS in Naval Science and Engineering Institute

TEACHING PHILOSOPHY

I adopt student centered learning approach where the student plays an active role in the learning process. I view my role as a mentor who facilitates the learning instead of a classical teacher. I provide guidelines and create a dynamic environment in which the students develop their own learning. I encourage them to achieve course goals through a flexible learning path. I prefer to stimulate and nurture the students' development, giving help in terms of knowledge, techniques, and encouragement.

The learning environment in my classes supports and challenges the student's thinking. I believe that my task is not to teach them the facts and techniques of a particular domain but to teach how to formulate problems and look for their solutions. For example, instead of giving directly the algorithm for the shortest path problem in graphs, I guide the students to characterize the recursive structure of an optimal solution and to develop the algorithm on their own. I promote the discovery and active learning of students.

Another important issue in my teaching approach is to make connections to the known concepts while teaching new concepts. I believe that this is the only way of growing our body of knowledge. In addition, I try to give good professional examples from the industry for each newly learned concept.

I encourage students to actively participate in the learning process. I think this can be achieved by building a good relationship with students. Starting from the first day in my class I make my students feel comfortable and participate in the discussions. My students know that all questions are welcome and that they are free to interrupt me anytime. I try to learn the names of all students attending to my class and to call them by name. My students also know that they are important for me. I always have time for them.

My teaching approach in undergraduate and graduate courses differs slightly. My emphasis in undergraduate courses is on improving their ability to learn new concepts. My goal is to achieve and nurture student's enthusiasm on the subjects in the course curriculum. In graduate courses, I prefer to use much more research oriented methods. I expect my graduate students to produce new ideas and make contributions to the related area, if possible.

COURSES GIVEN

- **Graduate Courses**
    - Pattern Recognition (Fall 2005)
    - Image Processing (Spring 2006)
    - Introduction to Command Control (Fall 2008)
    - Combat Analysis and Modeling (Spring 2009, 2010, 2011)
    - Machine Learning (Fall 2009, 2010, 2011, 2012)
    - Research Methods (Summer 2011)
    - Computer Vision (Spring 2013)
    - Artificial Intelligence (Spring 2013)

- **Undergraduate Courses**
  - Design and Analysis of Algorithms (Fall 2004, 2005, 2008, 2009, 2010, 2011, 2012)
  - Artificial Intelligence (Spring 2005, 2007, 2009, 2010, 2011, 2012, 2013)
  - Data Structures and Algorithms (Spring 2005, 2008, 2009, 2010, 2011)
  - Formal Languages and Automata (Fall 2012)
  - Computer Networks (Spring 2012, 2013)
  - Programming Languages (Spring 2005)
  - Software Engineering (Fall 2005, 2007)
  - Introduction to C Programming Language (Fall 2003), (Spring 2004,2005, 2006)

OTHER ACTIVITIES

- Committee Member of "Dictionary of Engineering Terms" (The Turkish Academy of Sciences)

- Reviewer for the journals
  - IEEE Transactions on Pattern Analysis and Machine Intelligence
  - IEEE Transactions on Multimedia
  - Journal of Pattern Recognition Letters
  - International Journal of Pattern Recognition and Artificial Intelligence
  - Turkish Journal of Electrical Engineering and Computer Science

- Program Committee Member and reviewer of conferences
  - International Conference on Pattern Recognition (ICPR)
  - Asian Conference on Computer Vision (ACCV)
  - International Conference on Image Analysis and Recognition (ICIAR)
  - IEEE Signal Processing and Communications Applications Conference

- Reviewer for grant proposals in Turkish National Council of Research

HONORS AND AWARDS

- Associate Professor rank received from Inter University Council (January 2011)
- IEEE Best paper award (2^{nd} place) in IEEE Signal Processing and Communications Applications Conference (SIU 2013)
- Best paper award in IEEE Signal Processing and Communications Applications Conference (SIU 2002)
- Best Master Thesis award 1998, Middle East Technical University

BIOGRAPHICAL

- Born: July 15, 1969 in Ankara, Turkey
- Languages spoken: Turkish (native), English (fluent), German (intermediate)
- Social activities involved:
  - Member of the METU Turkish Music Chorus
  - Volleyball Player in National Military Team
  - Coach of Turkish Navy Volleyball Team

REFERENCES

Narendra Ahuja
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