

# SELIM AKSOY

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## PERSONAL

Born in 1976 in Ankara, Turkey. Citizen of the Republic of Turkey. Speaks Turkish (native) and English (fluent).

## INTERESTS

Computer vision, statistical and structural pattern recognition, machine learning and data mining with applications to remote sensing, medical imaging and multimedia data analysis.

## EDUCATION

- 09/1998 – 06/2001** **Ph.D., Electrical Engineering**  
University of Washington, Seattle, WA, USA  
*Advisor:* Prof. Robert M. Haralick  
*Thesis:* A Probabilistic Similarity Framework for Content-Based Image Retrieval
- 09/1996 – 06/1998** **M.S., Electrical Engineering**  
University of Washington, Seattle, WA, USA  
*Advisor:* Prof. Robert M. Haralick  
*Thesis:* Textural Features for Content-Based Image Database Retrieval
- 09/1992 – 07/1996** **B.S., Electrical and Electronics Engineering**  
Middle East Technical University, Ankara, Turkey  
*B.S. Project:* Fingerprint Classification Using Wavelets

## EMPLOYMENT

- 01/2004 – Present** **Assistant Professor**  
Department of Computer Engineering,  
Bilkent University, Ankara, Turkey
- 09/2001 – 12/2003** **Research Scientist**  
Research Department,  
Insightful Corporation, Seattle, WA, USA
- 09/1996 – 06/2001** **Research Assistant**  
Intelligent Systems Laboratory,  
University of Washington, Seattle, WA, USA
- 06/2000 – 09/2000** **Research Intern**  
Data Analysis and Products Division,  
MathSoft Inc. (currently Insightful Corp.), Seattle, WA, USA
- 06/1998 – 08/1998** **Visiting Researcher**  
**06/1999 – 09/1999** Tampere International Center for Signal Processing,  
Tampere University of Technology, Tampere, Finland

## RESEARCH EXPERIENCE

### ▷ **Bilkent University, 01/2004 – Present**

- Researching multi-scale image segmentation, structural scene models and spatial relationships for geospatial object recognition, content-based classification and mining in remote sensing image archives.
- Researching image segmentation and classification for cell detection and cancer grading in microscopic images.
- Researching multi-modal information, context models, and relevance feedback for scene classification and object recognition for content-based classification and retrieval in image and video archives.
- Also participated in European Commission COST 292 Action on Semantic Multimodal Analysis of Digital Media; European Commission FP6 Network of Excellence, MUSCLE: Multimedia Understanding Through Semantics, Computation and Learning; U.S. National Institute of Standards and Technology, TREC Video Retrieval Evaluation (TRECVID).

### ▷ **Insightful Corporation, 09/2001 – 12/2003**

- Researched statistical and structural pattern recognition, computer vision, machine learning and data mining algorithms with applications to interactive analysis, classification and content-based retrieval of remote sensing and medical images.
- Project work included image classification using decision tree, rule-based, naive Bayes and maximum likelihood classifiers; image segmentation; data fusion and robustness to missing data; automatic scene modeling using attributed relational graphs.
- Lead developer for the machine learning library of the VisiMine product for interactive mining in large image databases.
- Developed image enhancement and post-processing algorithms for the optical character recognition (OCR) module of the InFact search engine for natural language question answering and information retrieval.

### ▷ **University of Washington, 09/1996 – 06/2001**

- Developed and implemented algorithms, and designed the user interface for a content-based image database retrieval (CBIR) system.
- Researched image texture and color feature extraction algorithms, probabilistic similarity models, graph-theoretic clustering and probabilistic relevance feedback for CBIR.
- Designed a Bayesian framework for fusion of different features and similarity models.
- Investigated parametric and non-parametric statistical modeling, estimation and statistical inference, classifier design, machine learning, Bayesian methods, quantization, clustering and mathematical morphology.
- Researched object recognition, model-based shape recognition, automatic target recognition.

### ▷ **MathSoft Inc., 06/2000 – 09/2000**

- Participated in the GeoBrowse project for content-based retrieval from remote sensing archives and added textural feature extraction and quantization algorithms.
- Worked on Bayesian interactive land cover label training algorithm using relevance feedback.
- Wrote functions and documentation for MathSoft Imaging C Library and Imaging Module for S-Plus statistical software.

### ▷ **Tampere University of Technology, Summer 1998 and Summer 1999**

Collaborated in a content-based multimedia database retrieval project and conducted research on texture feature extraction, system integration and relevance feedback.

## STUDENT SUPERVISION

### ▷ Current Graduate Students

- Hüseyin Gökhan Akçay, Ph.D. student, 09/2007–Present.
- Çağlar Arı, Ph.D. student, 03/2007–Present.
- Fatih Karakuş, M.S. student, 09/2009–Present.
- Caner Mercan, M.S. student, 09/2011–Present.
- Nermin Samet, M.S. student, 09/2011–Present.
- Ahsen İkbâl Yergök, M.S. student, 09/2009–Present.

### ▷ Current Undergraduate Students

- Gizem Demirel, Togan Şükrü Gençoğlu, Ertan Kantarcıoğlu, Yunus Nedim Mehel, Anıl Barış Saydere

### ▷ Past Graduate Students

- Bahadır Özdemir, M.S., “Structural Scene Analysis of Remotely Sensed Images Using Graph Mining,” 09/2008–07/2010. (Currently a Ph.D. student at the University of Maryland, College Park)
- Ash Kale, M.S., “Segmentation and Classification of Cervical Cell Images,” 09/2007–01/2010. (Currently a Ph.D. student at Middle East Technical University)
- Daniya Zamalieva, M.S., “Unsupervised Detection of Compound Structures Using Image Segmentation and Graph-Based Texture Analysis,” 09/2007–08/2009. (Currently a Ph.D. student at the Ohio State University)
- Fırat Kalaycılar, M.S., “An Object Recognition Framework Using Contextual Interactions Among Objects,” 09/2007–08/2009. (Currently a Ph.D. student at Brown University)
- İsmet Zeki Yalnız, Ph.D., “Multi-scale multi-orientation segmentation and classification of structural textures,” 10/2008–08/2009. (Continuing Ph.D. at the University of Massachusetts, Amherst)
- Özge Çavuş, M.S., “Semantic Scene Classification for Content-Based Image Retrieval,” 09/2005–08/2008.
- Demir Gökâl, M.S., “Scene Classification Using Bag-of-Regions Representation,” 09/2004–07/2007.
- Hüseyin Gökhan Akçay, M.S., “Hierarchical Segmentation, Object Detection and Classification in Remotely Sensed Images,” 09/2004–07/2007. (Currently a Ph.D. student at Bilkent University)
- Emel Doğrusöz, M.S., “Generalized Texture Models for Detecting High-Level Structures in Remotely Sensed Images,” 09/2005–06/2007.
- Ajda Karabulut, M.S., “Bayesian Scene Classification,” 09/2004–09/2006.

### ▷ Past Undergraduate Students

- 2010–2011: Aytek Aman, Semih Energin, Oğuz Ozan Kartal, Ayşenur Meçoğlu, Ezgi Mercan, Selin Sekmen, Zehra Uz
- 2009–2010: Enes Buğra Ağaoğlu, Erkam Akkurt, Nuri Murat Arar, Sami Arpa, Aytuğ Murat Aydın, Hasan Faruk Gümüşkesen, Alper Gün, Fatma Güney, Melih Gürgah, Alp Hoşsucu, Mustafa Özbek
- 2008–2009: Mert Küçük
- 2007–2008: Gökçe Balkan, Ramazan Gökberk Cinbiş, Ramazan Bertan Gündoğdu, Ali Osman Ulusoy

- 2006–2007: Ateş Akaydın, Cem Aksoy, Ebru Aydın, Ramazan Gökberk Cinbiş, Mert Eser Çetinkaya, Deniz Günaydın, Kerem Hadımlı, Levent Koç, Yunus Olgun, Can Orhan, Ali Osman Ulusoy, Görkem Yakın
- 2005–2006: Özer Akargün, Ateş Akaydın, Leman Akoğlu, Pelin Angın, Kazım Umur Aşkın, Ramazan Gökberk Cinbiş, Tunay Gür, Pınar Kavak, Ahmet Kızıl, Emre Küçükayvaz, Abdülkadir Tokgöz, Mehmet Ünlü
- 2004–2005: Akın Avcı, Erman Balçık, Ahmet Korhan Bircan, Ozan Dinçer, Zeynep Karaman, Cihan Kaynak, Mehmet Fatih Koca, Hüseyin Çağdaş Öcalan, Elif Bahar Önalın, Pınar Yıldız

## GRANTS

- “Mining of Very High Resolution Satellite Images Using Hierarchical Graph Models,” sponsored by TUBITAK (Scientific and Technological Research Council of Turkey), grant no: 109E193, 184,954 TL (~US\$123,000), 04/2010–10/2012, Principal Investigator.
- “Automatic Detection and Segmentation of Hazelnut Orchards in Northern Turkey,” sponsored by European Commission, Joint Research Centre, contract no: 252972, 14,750 Euro, 07/2008–03/2009, Principal Investigator.
- “Automatic Mapping of Linear Woody Vegetation Features in Agricultural Landscapes,” sponsored by European Commission, Joint Research Centre, contract no: 253352, 20,750 Euro, 01/2008–06/2008, Principal Investigator.
- “IST-TURKEY: New Information Society Technologies for Turkey,” sponsored by TUBITAK (Scientific and Technological Research Council of Turkey), grant no: 105E065, 12/2005–12/2008, Researcher and Head of Intelligent Systems Research Group.
- Research Development Grant from Provost Office, Bilkent University, US\$945, 12/2005.
- “Hierarchical Classification, Mining and Semantic Retrieval in Remote Sensing Image Archives,” sponsored by European Commission, FP6 Marie Curie International Reintegration Grant, grant no: MIRG-CT-2005-017504, 80,000 Euro, 10/2005–10/2007, Principal Investigator.
- “E-DEVLET İçin Bilgisayar Destekli Görsel Dokümantasyon, Arşiv ve Yönetim Sistemi Gerçekleş-tirilmesi,” sponsored by DPT (State Planning Agency), 5,000 TL, 08/2005–12/2005, Researcher.
- “Probabilistic and Structural Approaches to Image Understanding, Classification and Retrieval, and Applications to Remote Sensing and Medical Image Analysis (CAREER Award),” sponsored by TUBITAK (Scientific and Technological Research Council of Turkey), grant no: 104E074, 189,360 TL (~US\$126,000), 04/2005–04/2010, Principal Investigator.
- “Semantic Multimodal Analysis of Digital Media,” sponsored by TUBITAK (Scientific and Technological Research Council of Turkey), grant no: 104E077, 102,060 TL (~US\$64,000), 10/2004–10/2008, Co-Principal Investigator.
- Research Development Grant from Provost Office, Bilkent University, US\$2,200, 06/2004.
- “Interactive Training of Advanced Classifiers for Remote Sensing Image Analysis,” sponsored by the U.S. Army, Topographic Engineering Center, grant no: DACA42-03-C-0016, Phase I US\$70,000, 01/2003–06/2003, grant no: W9132V-04-C-0001, Phase II US\$780,000, 08/2003–12/2005, Principal Investigator (worked until moving to Bilkent University in 01/2004).
- “Knowledge Discovery and Data Mining based on Hierarchical Segmentation of Image Data,” sponsored by NASA, Goddard Space Flight Center, grant no: NAS5-01123, US\$430,000, 09/2001–09/2004, Investigator (worked until moving to Bilkent University in 01/2004).
- “A Bayesian Textual and Multimedia Information Retrieval Engine,” sponsored by the National Institutes of Health, National Library of Medicine, grant no: 2-R44-LM06520-02, US\$750,000, 09/2001–04/2004, Investigator (worked until moving to Bilkent University in 01/2004).
- “GeoBrowse: An Integrated Environment for Satellite Image Retrieval and Mining,” sponsored by NASA, Goddard Space Flight Center, grant no: NAS5-98053, US\$600,000, 10/1998–08/2001, Researcher (worked during 06/2000–09/2000).

## TEACHING EXPERIENCE

### ▷ Bilkent University

- CS 201: Fundamental Structures of Computer Science I, Fall 2011 (2 sections with a total of 105 students).
- CS 484: Image Analysis, Spring 2011 (23 students).
- CS 551: Pattern Recognition, Spring 2011 (27 students).
- CS 201: Fundamental Structures of Computer Science I, Fall 2010 (2 sections with a total of 112 students).
- CS 484: Image Analysis, Spring 2010 (29 students).
- CS 551: Pattern Recognition, Spring 2010 (30 students).
- CS 201: Fundamental Structures of Computer Science I, Fall 2009 (2 sections with a total of 86 students).
- CS 484: Image Analysis, Spring 2009 (10 students).
- CS 551: Pattern Recognition, Spring 2009 (27 students).
- CS 201: Fundamental Structures of Computer Science I, Fall 2008 (2 sections with a total of 90 students).
- CS 484: Image Analysis, Spring 2008 (24 students).
- CS 551: Pattern Recognition, Spring 2008 (22 students).
- CS 201: Fundamental Structures of Computer Science I, Fall 2007 (2 sections with a total of 92 students).
- CS 484: Image Analysis, Spring 2007 (22 students).
- CS 551: Pattern Recognition, Spring 2007 (24 students).
- CS 201: Fundamental Structures of Computer Science I, Fall 2006 (2 sections with a total of 89 students).
- CS 551: Pattern Recognition, Spring 2006 (25 students).
- CS 201: Fundamental Structures of Computer Science I, Fall 2005 (2 sections with a total of 131 students).
- CS 551: Pattern Recognition, Spring 2005 (34 students).
- CS 111: Introduction to Computing in Engineering and Science, Fall 2004 (2 sections with a total of 105 students).
- CS 111: Introduction to Computing in Engineering and Science, Summer 2004 (31 students).
- CS 111: Introduction to Computing in Engineering and Science, Spring 2004 (2 sections with a total of 130 students).

### ▷ University of Washington

- EE/CSE 576: Image Understanding, Spring 2001, Teaching Assistant.
- EE 562: Artificial Intelligence, Winter 2001, Teaching Assistant.
- EE/CSE 576: Image Understanding, Spring 2000, Guest Lecturer.
- EE 577: Mathematical Morphology, Fall 1998, Teaching Assistant.

## HONORS AND AWARDS

- Senior Member, Institute of Electrical and Electronics Engineers (IEEE), April 2011.
- Associate Professor title from the Inter-University Council (UAK) of Turkey, April 2010.
- European Commission Marie Curie Fellowship Award, 2005.

- Listed in Who's Who in Science and Engineering, 10th edition, Who's Who in the World, 25th edition, 2008.
- CAREER Award, given by TUBITAK (Scientific and Technological Research Council of Turkey), 2004.
- Third Prize in the Annual Poster Contest, Ph.D. Category, Department of Electrical Engineering, University of Washington, May 1999.
- NATO Science Fellowship, grant for graduate study from TUBITAK (Scientific and Technological Research Council of Turkey), 1996.
- Bülent Kerim Altay Award for academic excellence, given by the Department of Electrical Engineering, Middle East Technical University, Fall 1994, Spring 1995, Fall 1995.
- Undergraduate fellowship for academic achievement, given by Sabancı Foundation, 1992–1996.

## PROFESSIONAL ACTIVITIES

### ▷ Membership

- Institute of Electrical and Electronics Engineers (IEEE): Computer Society and Technical Committee on Pattern Analysis and Machine Intelligence, Geoscience and Remote Sensing Society and Data Fusion Committee, 1996–Present.
- International Association for Pattern Recognition (IAPR): Technical Committees on Statistical Pattern Recognition, Structural and Syntactic Pattern Recognition, Remote Sensing, Graph-Based Representations, Data Mining, 2001–Present.
- Turkish Society for Image Analysis and Pattern Recognition, 2004–Present.
- Executive Board Member and Webmaster for the Turkish-American Student Association at the University of Washington, 1999–2001.

### ▷ Editorial Service

- Associate Editor, Pattern Recognition Letters, 2009–Present.
- Guest Editor, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, Special Issue on Pattern Recognition in Remote Sensing, 2012.
- Guest Editor, Pattern Recognition Letters, Special Issue on Pattern Recognition in Remote Sensing, 2010.
- Guest Editor, IEEE Transactions on Geoscience and Remote Sensing, Special Issue on Pattern Recognition in Remote Sensing, 2007.
- Associate Editor, International Journal of Image and Graphics, 2005–2007.

### ▷ Reviewer

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Image Processing
- IEEE Transactions on Geoscience and Remote Sensing
- IEEE Transactions on Multimedia
- IEEE Transactions on Neural Networks
- IEEE Transactions on Medical Imaging
- IEEE Transactions on Circuits and Systems I
- IEEE Computer
- Pattern Recognition
- Pattern Recognition Letters
- Machine Vision and Applications

- Photogrammetric Engineering & Remote Sensing
- IEEE Geoscience and Remote Sensing Letters
- IEEE Journal of Selected Topics in Earth Observations and Remote Sensing
- Canadian Journal of Remote Sensing
- International Journal of Pattern Recognition and Artificial Intelligence
- EURASIP Journal on Applied Signal Processing
- Signal Processing
- Signal Processing: Image Communication
- Signal, Image and Video Processing
- Computers & Geosciences
- Computers and Electronics in Agriculture
- Journal of Electronic Imaging
- Journal of Computer Science and Technology

#### ▷ **Conference Organization**

- Organizer
  - Chair, 6th IAPR Workshop on Pattern Recognition in Remote Sensing (PRRS 2010).
  - Workshop Co-Chair, 20th IAPR International Conference on Pattern Recognition (ICPR 2010).
  - Contest Co-Chair, 20th IAPR International Conference on Pattern Recognition (ICPR 2010).
  - Co-Chair, ISPRS Workshop on Performance Evaluation of Pattern Recognition in Remote Sensing (PEPRRS 2009).
  - Chair, 5th IAPR Workshop on Pattern Recognition in Remote Sensing (PRRS 2008).
  - Yürütme Kurulu Üyesi ve Program Komitesi Eşbaşkanı, 3. Ulusal Yazılım Mühendisliği Sempozyumu (UYMS 2007) (Turkish).
  - Co-Chair, 4th International Workshop on Pattern Recognition in Remote Sensing (PRRS 2006).
  - Organizing Committee Member, Workshop on Spatial/Spatio-Temporal Data Mining and Learning (SDM 2005).
  - Organizer of the Algorithm Performance Contests in the 5th IAPR Workshop on Pattern Recognition in Remote Sensing, 2008, and in the IAPR International Conference on Pattern Recognition, 1998 and 2000.
- Program Committee Member
  - 7th IAPR Workshop on Pattern Recognition in Remote Sensing (PRRS 2012).
  - ESA-EUSC-JRC Image Information Mining Conference: Knowledge Discovery from Earth Observation Data (IIM 2012).
  - IEEE 20. Sinyal İşleme ve İletişim Uygulamaları Kurultayı (Turkish) (SIU 2012).
  - International Workshop on Spatial and Spatiotemporal Data Mining (SSTD 2011).
  - SPIE Conference on Image and Signal Processing for Remote Sensing (SPIE RS07 2011).
  - International Conference on Space Technology (SPACETECH 2011).
  - IEEE 19. Sinyal İşleme ve İletişim Uygulamaları Kurultayı (Turkish) (SIU 2011).
  - 10th International Workshop on Pattern Recognition in Information Systems (PRIS 2010).
  - International Workshop on Spatial and Spatiotemporal Data Mining (SSTD 2010).
  - SPIE Conference on Image and Signal Processing for Remote Sensing (SPIE RS07 2010).
  - ISPRS Symposium on Photogrammetric Computer Vision and Image Analysis (PCV 2010).
  - IEEE 18. Sinyal İşleme ve İletişim Uygulamaları Kurultayı (Turkish) (SIU 2010).

- International Workshop on Validation of Geo-information Products for Crisis Management (VALgEO 2009).
- International Workshop on Spatial and Spatiotemporal Data Mining (SSTDm 2009).
- ISPRS Workshop on Object Extraction for 3D City Models, Road Databases and Traffic Monitoring — Concepts, Algorithms and Evaluation (CMRT 2009).
- 13th International Conference on Computer Analysis of Images and Patterns (CAIP 2009).
- International Conference on Space Technology (2009).
- IEEE 17. Sinyal İşleme ve İletişim Uygulamaları Kurultayı (Turkish) (SIU 2009).
- 19th IAPR International Conference on Pattern Recognition (ICPR 2008).
- 3rd International Workshop on Semantic Learning and Applications in Multimedia (SLAM 2008).
- 23rd International Symposium on Computer and Information Sciences (ISCIS 2008).
- 9th International Workshop on Image Analysis for Multimedia Interactive Services (WIAMIS 2008).
- International Conference on Computer Vision Theory and Applications (VISAPP 2008).
- Pacific-Rim Conference on Multimedia (PCM 2007).
- IEEE International Workshop on Semantic Learning Applications in Multimedia (SLAM 2007).
- SPIE Multimedia Systems and Applications X (2007).
- International Symposium on Computer and Information Sciences (ISCIS 2007).
- 7th International Workshop on Pattern Recognition in Information Systems (PRIS 2007).
- International Conference on Computer Vision Theory and Applications (VISAPP 2007).
- 18th IAPR International Conference on Pattern Recognition (ICPR 2006).
- 6th International Workshop on Pattern Recognition in Information Systems (PRIS 2006).
- International Conference on Computer Vision Theory and Applications (VISAPP 2006).
- Review Committee Member
  - IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2012).
  - IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2011).
  - IEEE International Conference on Computer Vision and Pattern Recognition (CVPR 2010).
  - IEEE International Conference on Computer Vision (ICCV 2009).
  - IEEE International Conference on Computer Vision and Pattern Recognition (CVPR 2009).
  - IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2009).
  - IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2008).

#### ▷ Institutional Service

- Co-director, RETINA Vision and Learning Group, Department of Computer Engineering, Bilkent University, 2004–Present.
- Chair, International Association for Pattern Recognition (IAPR) Technical Committee on Remote Sensing, 2006–2008, 2008–2010.
- Vice-Chair, International Association for Pattern Recognition (IAPR) Technical Committee on Remote Sensing, 2004–2006.
- Co-Chair, International Society for Photogrammetry and Remote Sensing (ISPRS) Intercommission Working Group III/VII on Pattern Recognition for Remote Sensing, 2008–2012.
- Member, Program Improvement Coordination Committee, Department of Computer Engineering, Bilkent University, 2004–2011.
- Member, Alumni Performance Evaluation Committee, Department of Computer Engineering, Bilkent University, 2004–Present.
- Member, Summer Practice Committee, Department of Computer Engineering, Bilkent University, 2005–Present.

## COMPUTER SKILLS

- Programming: C/C++, Java, Matlab, S-Plus, Pascal, LISP, SQL, Assembly (Intel 8051 and Motorola 6800).
- Operating Systems: UNIX (SunOS, Solaris, HP-UX), Linux, Windows NT/2000/XP.
- Scripting: Perl, UNIX Shell, Visual Basic Scripting, Microsoft Active Server Pages.
- Others: Perforce, RCS, Microsoft SourceSafe, Purify, LaTeX, HTML, CGI, PostScript.

## PUBLICATIONS

### ▷ Journal Publications

1. A. Genctav, **S. Aksoy**, and S. Onder. “Unsupervised segmentation and classification of cervical cell images”. *Pattern Recognition*, 2012. (revised version in review).
2. C. Ari, **S. Aksoy**, and O. Arikan. “Maximum likelihood estimation of Gaussian mixture models using stochastic search”. *Pattern Recognition*, 2012. (accepted).
3. **S. Aksoy**, I. Z. Yalniz, and K. Tasdemir. “Automatic detection and segmentation of orchards using very high-resolution imagery”. *IEEE Transactions on Geoscience and Remote Sensing*, 2012. (accepted).
4. I. Z. Yalniz and **S. Aksoy**. “Unsupervised detection and localization of structural textures using projection profiles”. *Pattern Recognition*, 43(10):3324–3337, October 2010.
5. B. Ozdemir, **S. Aksoy**, S. Eckert, M. Pesaresi, and D. Ehrlich. “Performance measures for object detection evaluation”. *Pattern Recognition Letters*, 31(10):1128–1137, July 15, 2010.
6. **S. Aksoy**, N. H. Younan, and L. Bruzzone. “Pattern recognition in remote sensing (editorial)”. *Pattern Recognition Letters*, 31(10):1069–1070, July 15, 2010.
7. **S. Aksoy**, H. G. Akcay, and T. Wassenaar. “Automatic mapping of linear woody vegetation features in agricultural landscapes using very high-resolution imagery”. *IEEE Transactions on Geoscience and Remote Sensing*, 48(1):511–522, January 2010.
8. **S. Aksoy** and R. G. Cinbis. “Image mining using directional spatial constraints”. *IEEE Geoscience and Remote Sensing Letters*, 7(1):33–37, January 2010.
9. **S. Aksoy**, K. Koperski, C. Tusk, and G. Marchisio. “Land cover classification with multi-sensor fusion of partly missing data”. *Photogrammetric Engineering & Remote Sensing*, 75(5):577–593, May 2009.
10. H. G. Akcay and **S. Aksoy**. “Automatic detection of geospatial objects using multiple hierarchical segmentations”. *IEEE Transactions on Geoscience and Remote Sensing*, 46(7):2097–2111, July 2008.
11. D. A. Clausi, **S. Aksoy**, and J. C. Tilton. “Foreword to the special issue on pattern recognition in remote sensing (editorial)”. *IEEE Transactions on Geoscience and Remote Sensing*, 45(12):3855–3856, December 2007.
12. **S. Aksoy**, K. Koperski, C. Tusk, G. Marchisio, and J. C. Tilton. “Learning Bayesian classifiers for scene classification with a visual grammar”. *IEEE Transactions on Geoscience and Remote Sensing*, 43(3):581–589, March 2005.
13. **S. Aksoy** and R. M. Haralick. “Feature normalization and likelihood-based similarity measures for image retrieval”. *Pattern Recognition Letters*, 22(5):563–582, May 2001.

### ▷ Book Chapters

14. **S. Aksoy**, R. G. Cinbis, and H. G. Akcay. “Image classification and object detection using spatial contextual constraints”. In C. H. Chen, editor, *Signal and Image Processing for Remote Sensing*, pages 441–461. CRC Press, 2nd edition, 2012.
15. **S. Aksoy**. “Spatial techniques for image classification”. In C. H. Chen, editor, *Signal and Image Processing for Remote Sensing*, pages 491–513. CRC Press, 2006.

16. **S. Aksoy**, C. Tusk, K. Koperski, and G. Marchisio. “Scene modeling and image mining with a visual grammar”. In C. H. Chen, editor, *Frontiers of Remote Sensing Information Processing*, pages 35–62. World Scientific, 2003.
17. **S. Aksoy** and R. M. Haralick. “Using texture in image similarity and retrieval”. In M. Pietikainen, editor, *Texture Analysis in Machine Vision*, volume 40 of *Series in Machine Perception and Artificial Intelligence*, pages 129–149. World Scientific, 2000.

▷ **Edited Books**

18. D. Unay, Z. Cataltepe, and **S. Aksoy**, editors. *Recognizing Patterns in Signals, Speech, Images, and Videos — ICPR 2010 Contests*, volume 6388 of *Lecture Notes in Computer Science*. Springer, 2010.
19. **S. Aksoy**, N. H. Younan, and W. Forstner, editors. *Proceedings of 2010 IAPR Workshop on Pattern Recognition in Remote Sensing*. IEEE, Catalog Number: CFP1080E-ART, 2010.
20. **S. Aksoy** and N. H. Younan, editors. *Proceedings of 2008 IAPR Workshop on Pattern Recognition in Remote Sensing*. IEEE, Catalog Number: CFP0880E, 2008.

▷ **Conference Publications**

21. C. Ari and **S. Aksoy**. “Detection of compound structures using a Gaussian mixture model with spectral and spatial constraints”. In *Proceedings of SPIE Defense, Security, and Sensing: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVIII*, Baltimore, Maryland, April 23–27, 2012.
22. H. G. Akcay and **S. Aksoy**. “Detection of compound structures using hierarchical clustering of statistical and structural features”. In *Proceedings of IEEE International Geoscience and Remote Sensing Symposium*, pages 2385–2388, Vancouver, Canada, July 25–29, 2011.
23. H. G. Akcay and **S. Aksoy**. “Detection of heterogeneous structures using hierarchical segmentation”. In *Proceedings of 19th IEEE Signal Processing and Communications Applications*, Antalya, Turkey, April 20–22, 2011.
24. H. G. Akcay, **S. Aksoy**, and P. Soille. “Hierarchical segmentation of complex structures”. In *Proceedings of 20th IAPR International Conference on Pattern Recognition*, pages 1120–1123, Istanbul, Turkey, August 23–26, 2010.
25. A. Kale and **S. Aksoy**. “Segmentation of cervical cell images”. In *Proceedings of 20th IAPR International Conference on Pattern Recognition*, pages 2399–2402, Istanbul, Turkey, August 23–26, 2010.
26. B. Ozdemir and **S. Aksoy**. “Image classification using subgraph histogram representation”. In *Proceedings of 20th IAPR International Conference on Pattern Recognition*, pages 1112–1115, Istanbul, Turkey, August 23–26, 2010.
27. C. Ari and **S. Aksoy**. “Maximum likelihood estimation of Gaussian mixture models using particle swarm optimization”. In *Proceedings of 20th IAPR International Conference on Pattern Recognition*, pages 746–749, Istanbul, Turkey, August 23–26, 2010.
28. C. Ari and **S. Aksoy**. “Unsupervised classification of remotely sensed images using Gaussian mixture models and particle swarm optimization”. In *Proceedings of IEEE International Geoscience and Remote Sensing Symposium*, pages 1859–1862, Honolulu, Hawaii, July 25–30, 2010.
29. H. G. Akcay and **S. Aksoy**. “Building detection using directional spatial constraints”. In *Proceedings of IEEE International Geoscience and Remote Sensing Symposium*, pages 1932–1935, Honolulu, Hawaii, July 25–30, 2010.
30. **S. Aksoy**. “Automatic detection of hedges and orchards using very high spatial resolution imagery”. In *Proceedings of 15th GeoCAP Conference on Geomatics in Support of the Common Agricultural Policy*, Taormina, Italy, November 18–20, 2009.

31. D. Zamalieva, **S. Aksoy**, and J. C. Tilton. “Finding compound structures in images using image segmentation and graph-based knowledge discovery”. In *Proceedings of IEEE International Geoscience and Remote Sensing Symposium*, volume V, pages 252–255, Cape Town, South Africa, July 13–17, 2009.
32. I. Z. Yalniz and **S. Aksoy**. “Detecting regular plantation areas in satellite images”. In *Proceedings of 17th IEEE Signal Processing and Communications Applications*, Antalya, Turkey, April 9–11, 2009.
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69. **S. Aksoy** and R. M. Haralick. “Graph-theoretic clustering for image grouping and retrieval”. In *Proceedings of IEEE Conference on Computer Vision and Pattern Recognition*, volume 1, pages 63–68, Fort Collins, Colorado, June 23–25, 1999.
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▷ **Nonrefereed Conference Publications**

75. **S. Aksoy**, P. Duygulu, C. Aksoy, E. Aydin, D. Gunaydin, K. Hadimli, L. Koc, Y. Olgun, C. Orhan, and G. Yakin. “Bilkent University in TRECVID 2007”. In *Proceedings of TREC Video Retrieval Evaluation*, Gaithersburg, Maryland, November 5–6, 2007.
76. Q. Zhang, M. Corvaglia, **S. Aksoy**, U. Naci, N. Adami, N. Aginako, A. Alatan, L. A. Alexandre, P. Almeida, Y. Avrithis, J. Benois-Pineau, K. Chandramouli, U. Damnjanovic, E. Esen, J. Goya, M. Grzegorzec, A. Hanjalic, E. Izquierdo, R. Jarina, P. Kapsalas, I. Kompatsiaris, M. Kuba,

- R. Leonardi, L. Makris, B. Mansencal, V. Mezaris, A. Moutzidou, P. Mylonas, S. Nikolopoulos, T. Piatrik, A. M. G. Pinheiro, B. Reljin, E. Spyrou, G. Toliás, S. Vrochidis, G. Yakin, and G. Zajic. “The COST292 experimental framework for TRECVID 2007”. In *Proceedings of TREC Video Retrieval Evaluation*, Gaithersburg, Maryland, November 5–6, 2007.
77. **S. Aksoy**, P. Duygulu, G. Akcay, E. Ataer, M. Bastan, T. Can, O. Cavus, E. Dogrusoz, D. Gokalp, A. Akaydin, L. Akoglu, P. Angin, G. Cinbis, T. Gur, and M. Unlu. “Bilkent University in TRECVID 2006”. In *Proceedings of TREC Video Retrieval Evaluation*, Gaithersburg, Maryland, November 13–14, 2006.
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80. **S. Aksoy**, K. Bircan, S. Ciraci, P. Duygulu, E. Karaca, S. Kasirga, T. Sevilmis, and M. Sener. “Bilkent University in TRECVID 2004”. In *Proceedings of TREC Video Retrieval Evaluation*, Gaithersburg, Maryland, November 15–16, 2004.

## CITATIONS

- Total number of citations in the Institute of Scientific Information (ISI) Web of Science: 338
  - Citations by others: 276
  - Self citations: 62
- h-index: 10

## TALKS AND PRESENTATIONS

### ▷ Invited Talks

- “Structural Analysis of Geospatial Data for Unsupervised Object Recognition,” invited talk at the Department of Biomedical, Electronic and Telecommunications Engineering, University of Naples Federico II, Naples, Italy, May 18, 2011.
- “Segmentation and Classification of Cervical Cell Images,” invited talk at the Department of Biomedical, Electronic and Telecommunications Engineering, University of Naples Federico II, Naples, Italy, May 17, 2011.
- “Spatial Relationship Models for Image Information Mining,” invited talk at the Department of Biomedical, Electronic and Telecommunications Engineering, University of Naples Federico II, Naples, Italy, May 16, 2011.
- “Performance Evaluation of Object Detection Algorithms,” keynote talk at the 7th Conference on Image Information Mining: Geospatial Intelligence from Earth Observation, Ispra, Italy, April 1, 2011.
- “Automatic Mapping of Agricultural Objects Using Very High Spatial Resolution Satellite Imagery,” plenary talk at the 6th Technical Symposium of the Turkish National Society for Photogrammetry and Remote Sensing, Antalya, Turkey, February 24, 2011.
- “Structural Modeling of Geospatial Data for Unsupervised Object Recognition,” invited talk at the Informatics Institute at Middle East Technical University, Ankara, Turkey, October 12, 2010.
- “Automatic Detection of Hedges and Orchards Using Very High Spatial Resolution Imagery,” invited talk at the 15th GeoCAP Conference on Geomatics in Support of the Common Agricultural Policy, Taormina, Italy, November 19, 2009.

- “Spatial Relationship Models for Image Information Mining,” invited lecture at the Global Earth Observation System of Systems — Summer School on Advancing Earth Observation Data Understanding, Sinaia, Romania, September 3, 2009.
- “Structural Models for Content-Based Classification and Retrieval of Geospatial Data,” invited talk at the Workshop on Innovative Data Mining Techniques in Support of Global Earth Observation System of Systems, Sinaia, Romania, September 2, 2009.
- “Structural Modeling of Geospatial Data for Unsupervised Object Recognition,” invited talk at the Department of Mathematics, Kyushu University, Fukuoka, Japan, June 19, 2009.
- “Nesne Tanımada Bağlam ve Anlambilimsel Sınıflandırmanın Önemi: Bilgisayarla Görme ve İnsanda Görme Alanlarındaki Çalışmalar (in Turkish),” invited panel talk at the 16th IEEE Conference on Signal Processing and Communications Applications, Didim, Turkey, April 21, 2008.
- “Hierarchical Classification, Mining and Semantic Retrieval in Remote Sensing Image Archives,” invited talk at TUBITAK (Scientific and Technological Research Council of Turkey), Ankara, Turkey, November 27, 2007.
- “Statistical and Structural Modeling of Geospatial Patterns Using Mathematical Morphology and Generalized Texture Techniques,” invited talk at the European Commission Joint Research Centre, Institute for the Protection and Security of the Citizen, Ispra, Italy, July 30, 2007.
- “Scene Classification and Retrieval Using Bag-of-Regions Representations,” invited talk at the Department of Computer Science & Engineering at the University of Washington, Seattle, Washington, June 26, 2007.
- “Modeling Urbanization Using Spatial Building Patterns,” invited talk at the Department of Geodetic and Geographic Information Technologies at Middle East Technical University, Ankara, Turkey, November 22, 2006.
- “Graph-Theoretic Clustering for Image Grouping and Retrieval,” invited lecture at the Statistical Data Analysis Seminar at the Department of Computer Engineering at Middle East Technical University, Ankara, Turkey, April 20, 2006.
- “Probabilistic Approaches to Image Classification and Content-Based Retrieval,” invited talk at the Computer Vision and Intelligent Systems Seminar Series at the Department of Electrical Engineering at Middle East Technical University, Ankara, Turkey, May 17, 2004.
- “A Probabilistic Similarity Framework for Content-Based Image Retrieval,” invited talk at the Department of Computer Engineering at Middle East Technical University, Ankara, Turkey, March 31, 2004.
- “Classification and Retrieval of Tissue Images Using a Visual Grammar,” invited talk at the Structural Informatics Research Seminar at the Department of Biological Structure at the University of Washington, Seattle, Washington, October 30, 2002.

#### ▷ Other Presentations

- “Detection of Compound Structures Using Hierarchical Clustering of Statistical and Structural Features,” IEEE International Geoscience and Remote Sensing Symposium, Vancouver, Canada, July 27, 2011.
- “Image Classification Using Subgraph Histogram Representation,” (poster presentation) IAPR International Conference on Pattern Recognition, Istanbul, Turkey, August 24, 2010.
- “Building Detection Using Directional Spatial Constraints,” IEEE International Geoscience and Remote Sensing Symposium, Honolulu, Hawaii, July 28, 2010.
- “Unsupervised Classification of Remotely Sensed Images Using Gaussian Mixture Models and Particle Swarm Optimization,” IEEE International Geoscience and Remote Sensing Symposium, Honolulu, Hawaii, July 28, 2010.

- “Automatic Detection and Segmentation of Hazelnut Orchards in Northern Turkey,” European Commission Joint Research Centre, Institute for the Protection and Security of the Citizen, Ispra, Italy, November 23, 2009.
- “Finding Compound Structures in Images Using Image Segmentation and Graph-Based Knowledge Discovery,” IEEE International Geoscience and Remote Sensing Symposium, Cape Town, South Africa, July 17, 2009.
- “Algorithm Performance Contest,” IAPR Workshop on Pattern Recognition in Remote Sensing, Tampa, Florida, December 7, 2008.
- “Semantic Scene Classification for Image Annotation and Retrieval,” (poster presentation) IAPR International Workshop on Structural and Syntactic Pattern Recognition, Orlando, Florida, December 5, 2008.
- “Automatic VHR Imagery Based Mapping of Linear Woody Vegetation Features in Agricultural Landscapes,” European Commission Joint Research Centre, Institute for the Protection and Security of the Citizen, Ispra, Italy, September 9, 2008.
- “Automatic Mapping of Linear Woody Vegetation Features in Agricultural Landscapes,” IEEE International Geoscience and Remote Sensing Symposium, Boston, Massachusetts, July 10, 2008.
- “Mining of Remote Sensing Image Archives Using Spatial Relationship Histograms,” IEEE International Geoscience and Remote Sensing Symposium, Boston, Massachusetts, July 9, 2008.
- “İçerik Tabanlı Görüntü Erişimi İçin Sahne Sınıflandırması (in Turkish),” IEEE Sinyal İşleme ve İletişim Uygulamaları Kurultayı, Didim, Turkey, April 21, 2008.
- “Relative Position-Based Spatial Relationships Using Mathematical Morphology,” IEEE International Conference on Image Processing, San Antonio, Texas, September 17, 2007.
- “Modeling Urban Structures Using Graph-Based Spatial Patterns,” IEEE International Geoscience and Remote Sensing Symposium, Barcelona, Spain, July 27, 2007.
- “Automated Detection of Objects Using Multiple Hierarchical Segmentations,” IEEE International Geoscience and Remote Sensing Symposium, Barcelona, Spain, July 24, 2007.
- “Scene Classification Using Bag-of-Regions Representations,” IEEE Conference on Computer Vision and Pattern Recognition, Beyond Patches Workshop, Minneapolis, Minnesota, June 23, 2007.
- “Modeling Urbanization Using Spatial Building Patterns,” IAPR International Workshop on Pattern Recognition in Remote Sensing, Hong Kong, China, August 20, 2006.
- “Modeling of Remote Sensing Image Content Using Attributed Relational Graphs,” (poster presentation) IAPR International Workshop on Structural and Syntactic Pattern Recognition, Hong Kong, China, August 19, 2006.
- “A Relevance Feedback Technique for Multimodal Retrieval of News Videos,” Belgrade, Serbia & Montenegro, November 24, 2005.
- “Finding Faces in News Videos,” International Workshop on Content-Based Multimedia Indexing, Riga, Latvia, June 21, 2005.
- “Multi-resolution Segmentation and Shape Analysis for Remote Sensing Image Classification,” International Conference on Recent Advances in Space Technologies, Istanbul, Turkey, June 9, 2005.
- “Bilkent University at TRECVID 2004,” (poster presentation) U.S. National Institute of Standards and Technology, Gaithersburg, MD, November 15, 2004.
- “Interactive Training of Advanced Classifiers for Remote Sensing Image Analysis,” U.S. Army Topographic Engineering Center, Alexandria, VA, December 1, 2003.
- “Learning Bayesian Classifiers for a Visual Grammar,” (poster presentation) NASA Goddard Space Flight Center, Greenbelt, MD, October 28, 2003.
- “Probabilistic Approaches to Image Classification and Content-Based Retrieval,” Department of Computer Engineering at Bilkent University, Ankara, Turkey, September 2, 2003.

- “Probabilistic Approaches to Image Classification and Content-Based Retrieval,” Department of Computer Science at Sabancı University, Istanbul, Turkey, August 15, 2003.
- “Probabilistic Approaches to Image Classification and Content-Based Retrieval,” Engineering Seminar at Koç University, Istanbul, Turkey, July 16, 2002.
- “VisiMine: Interactive Mining in Image Databases,” IEEE International Geoscience & Remote Sensing Symposium, Toronto, Canada, June 28, 2002.
- “Probabilistic Retrieval with a Visual Grammar,” IEEE International Geoscience & Remote Sensing Symposium, Toronto, Canada, June 26, 2002.
- “Applications of Terrain and Sensor Data Fusion in Image Mining,” IEEE International Geoscience & Remote Sensing Symposium, Toronto, Canada, June 26, 2002.
- “A Probabilistic Similarity Framework for Content-Based Image Retrieval,” Image Mining Workshop at Insightful Corporation, Seattle, WA, June 15, 2001.
- “A Probabilistic Framework for Content-Based Image Database Retrieval,” Fuji-Xerox Palo Alto Laboratory, Palo Alto, CA, April 6, 2001.
- “A Probabilistic Framework for Content-Based Image Database Retrieval,” IBM Almaden Research Center, San Jose, CA, February 20, 2001.
- “Using Texture in Image Similarity and Retrieval,” International Workshop on Texture Analysis in Machine Vision, Oulu, Finland, June 15, 1999.
- “A Graph Theoretic Approach to Image Database Retrieval,” (poster presentation) International Conference on Visual Information Systems, Amsterdam, The Netherlands, June 3, 1999.
- “Content-Based Image Database Retrieval,” (poster presentation) Annual Poster Contest at the Department of Electrical Engineering at the University of Washington, May 21, 1999.
- “Textural Features for Image Database Retrieval,” IEEE Workshop on Content-Based Access of Image and Video Libraries, Santa Barbara, CA, June 21, 1998.

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