

CEYHUN BURAK AĞÜL

Research Scientist & Professional

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Resume as of February 2015

PROFILE

PhD in Electrical and Electronics Engineering -- Specialized on the theory and applications of Computer Vision and Machine Learning -- Expert on visual search, content-based multimedia retrieval, human-centric computer vision applications and vision-based industrial automation systems -- Interested in Visual Arts, Design, and Architecture

CURRENT POSITIONS

FOUNDER & GENERAL MANAGER, VISPORA INFORMATION TECHNOLOGIES (İSTANBUL, TURKEY) — 2014-PRESENT

Founded Vispera IT targeting automated visual search applications for the retail and media sectors -- Leads the computer vision R&D team

ADJUNCT FACULTY & RESEARCH ASSOCIATE, BOĞAZİÇİ UNIVERSITY (İSTANBUL, TURKEY) — 2010-PRESENT

Senior Research Associate at BUSIM and VAVLab -- Teaches graduate courses in Electrical and Electronics Engineering Dept. (Spring 2010, Spring 2011, Spring 2013, Spring 2014, Spring 2015: Data Mining for Visual Media; Spring 2012: Image Analysis) -- Guides several senior, MS and PhD students on their graduation projects

TECHNICAL ADVISOR, FLAVOURSAPCE BV (AMSTERDAM, THE NETHERLANDS) — 2014-PRESENT

Flavourspace is a food search and discovery startup offering technology tools to empower people in discovering the right dishes and in adapting them to their preferences.

PAST EXPERIENCE

R&D DIRECTOR, VISTEK ISRA VISION (İSTANBUL, TURKEY) — 2011-2014

SENIOR RESEARCH SCIENTIST, VISTEK ISRA VISION (İSTANBUL, TURKEY) — 2010-2011

Designed and developed machine vision solutions for industrial automation -- Led the Vision R&D team in industrial automation projects involving surface inspection, non-contact 3D measurement, part validation and positioning, assembly inspection, etc. -- Led human-centric computer vision projects involving face and body analysis, behavior analysis, object tracking and recognition -- Coordinated EU Framework and ITEA projects -- Organized internal training courses

ADJUNCT FACULTY & CONSULTANT, İSTANBUL TECHNICAL UNIVERSITY (İSTANBUL, TURKEY) — 2010-2012

Supervises and acts as consultant for a design studio course in the Digital Architectural Design Programme -- Architecture Dept. (Spring 2010: Data Mining for Architecture and Urban Planning; Spring 2011: The Digital Shape; Spring 2012: Shape Emergence)

MARIE CURIE RESEARCH FELLOW, PHILIPS RESEARCH (EINDHOVEN, THE NETHERLANDS) — 2008-2009

Recipient of the Marie Curie postdoctoral grant to work in the EU 6th Framework Project IRonDB (Content-based Retrieval and Indexing in Brain MR Databases) -- Member of the Video Processing and Analysis Group -- Developed automated second-reader tools and a prototype retrieval system for MRI based diagnosis of dementia -- Filed a patent application -- Published papers in ACM CIVR 2009 and in ICPR 2010

POSTDOCTORAL RESEARCHER, BOĞAZIÇI UNIVERSITY (ISTANBUL, TURKEY) — 2008

Worked on liver lesion segmentation from CT scans and surveyed medical retrieval systems in the Visualization and Volumetric Analysis Group (VAVlab) of the EE Dept. -- Collaborated with the Stanford University Radiology Dept. -- Published a state of the art survey on Medical Image Retrieval Systems in the Journal of Digital Imaging -- Supervised senior BS and MS students -- Organized a reading group on medical image segmentation and content-based medical image retrieval

PHD STUDENT, TELECOM PARISTECH (FRANCE) AND BOĞAZIÇI UNIVERSITY (TURKEY) — 2004-2007

Recipient of the French Government doctoral grant for his joint PhD studies at Télécom ParisTech (ENST/TSI) and Boğaziçi University EE Dept. -- Worked on the theory and applications of 3D shape analysis and descriptors, differential geometry, machine learning, and relevance feedback driven retrieval systems -- Developed a novel 3D shape description framework and a novel machine learning algorithm for relevance feedback -- Published several papers in top journals and conferences such as IEEE TPAMI, IJCV, EURASIP JASP, Eurographics, and IEEE-ACM SMI -- Shape description system ranked 2nd in the SHREC Watertight Models Track in 2007 among 10 participating groups -- Also published academic work on topics different than PhD thesis

MS STUDENT, BOĞAZIÇI UNIVERSITY (ISTANBUL, TURKEY) — 2002-2003

Worked on the analysis of functional near infrared spectroscopy signals (fNIRS) -- Developed signal processing and statistical analysis tools for fNIRS -- Published two journal papers (one in the Journal of Computational Neuroscience) and several conference papers -- Completed the MS programme in three academic semesters

EDUCATION

Télécom ParisTech (ENST/TSI), Paris, France — PhD, 2007

Boğaziçi University, Istanbul, Turkey — PhD in EE (3.92 GPA), 2007

Boğaziçi University, Istanbul, Turkey — MS in EE (4.00 GPA), 2004

Boğaziçi University, Istanbul, Turkey — BS in EE (with Honors), 2002

SKILLS

LANGUAGES

English (fluent written and oral), French (fluent written and oral), Turkish (native)

RESEARCH SOFTWARE AND API SKILLS

Expert on Mathworks MATLAB, MVTec HALCON, OpenCV, RapidMiner, LaTeX

PROGRAMMING

Proficient in C/C++/C# under MS Visual Studio and Qt development environments

Fluent with MS Windows, Mac OS and Unix-based systems; experience on web page design

RESEARCH

TOPICAL SKILLS AND INTERESTS

Computer and Machine Vision: visual content analysis and description, image and shape matching, object tracking and recognition, image segmentation, human behavior analysis, industrial inspection and measurement systems

Machine Learning: similarity learning, statistical ranking, discriminative models, collaborative filtering, data mining, exploratory data analysis, clustering, semi-supervised learning, Bayesian theory and its applications

Content-Based Retrieval: multimedia content description, user modeling & intelligent search paradigms, relevance feedback and models, diagnosis-by-retrieval framework

SELECTED PUBLICATIONS // (*) FULL LIST AVAILABLE AT THE END OF THIS DOCUMENT.

C. B. Akgül, B. Sankur, Y. Yemez, F. Schmitt. Similarity Learning for 3D Object Retrieval using Relevance Feedback and Risk Minimization. *Int. Journal of Computer Vision, Special Issue on 3D Object Retrieval*, vol. 89, no. 2-3, pp. 392-407, 2010.

C. B. Akgül, B. Sankur, Y. Yemez, F. Schmitt. 3D Model Retrieval using Probability Density-Based Shape Descriptors. *IEEE Trans. on PAMI*, vol. 31, no. 6, pp. 1117-1133, June 2009.

C. B. Akgül, D. L. Rubin, S. Napel, C. F. Beaulieu, H. Greenspan, B. Acar. Content-Based Image Retrieval in Radiology: Current Status and Future Directions. *Journal of Digital Imaging*, vol. 24, no. 2, pp. 208-22, April 2011.

C. B. Akgül, B. Sankur, A. Akin. Spectral analysis of event-related hemodynamic responses in functional near infrared spectroscopy. *Journal of Computational Neuroscience*, vol. 18, pp. 67-83, January 2005.

C. B. Akgül, A. Ekin. Relevance Feedback for Content-Based Image Retrieval. WIPO Patent Application WO/2011/001331, International class G06F17/30, filing date 23-June-2010, publication date 06-Jan-2011.

REVIEWING ACTIVITIES

- IEEE Transactions on Image Processing
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Multimedia
- IEEE Transactions on Biomedical Engineering
- Signal Processing
- The Visual Computer
- EURASIP Journal on Advances in Signal Processing
- Journal of Digital Imaging
- The Computer Journal
- Journal of Selected Topics in Signal Processing
- PC Member in the Eurographics Workshop on 3D Object Retrieval (EG 3DOR), 2011-2015
- PC Member in 14th International Conference on Computer Analysis of Images and Patterns (CAIP), 2011-2015
- International Conference on Image Processing, 2009-2015
- International Conference on Pattern Recognition, 2010-2015

ACTIVITIES

MEMBERSHIPS

- ACM Professional Member, since 2009.
- IEEE Student Member, 1998-2008.
- ACM Student Member, 2004-2008.
- EURASIP Member, since 2006.
- Member of the Administrative Board, Boğaziçi University Scuba Club, 1999-2002.
- Member of Galatasaray Sports Club, since 2005.
- Member of Boğaziçi University Alumni, since 2006.

DIVING AND PUBLISHING

- CMAS 2* Scuba Diving Instructor, since 2004.
- Divers Alert Network (DAN) Oxygen First Aid Provider, *since* 2006.
- Diver & Researcher, Research on Underwater Species Richness in the Lykian Coasts of the Mediterranean, sponsored by World Wildlife Foundation (WWF), 2002 and 2006.
- Founding Editor of Turkey's First Student Underwater Magazine **derin**, 2000.
- Supervisor of the Underwater Magazine **derin** (published in Turkish), 2000-2004.
- Editorial Board of the Underwater Magazine **derin**, *since* 2000.
- Literary and Technical Writings in **derin**, *since* 2000.
- Underwater Photography Course Instructor, Boğaziçi University Scuba Club, 2003.
- Contribution to *Scuba Diver HandBooks*, Boğaziçi University Scuba Club Training Booklets, 2002.

OTHER INTERESTS

- Writing, publishing and literature
- Art history, human cognition and perception
- Cooking
- Photography
- City walking
- Jazz, Lindy hop dance

PUBLICATIONS

THESES

PhD Thesis: Density-Based Shape Descriptors and Similarity Learning for 3D Object Retrieval. *Télécom ParisTech and Boğaziçi University*, November 2007.

MS Thesis: Analysis of Functional Near Infrared Spectroscopy Signals. *Boğaziçi University*, January 2004.

IN JOURNALS

1. **C. B. Akgül**, D. L. Rubin, S. Napel, C. F. Beaulieu, H. Greenspan, B. Acar. Content-Based Image Retrieval in Radiology: Current Status and Future Directions. *Journal of Digital Imaging*, vol. 24, no. 2, pp. 208-22, April 2011.
2. **C. B. Akgül**, B. Sankur, Y. Yemez, F. Schmitt. Similarity Learning for 3D Object Retrieval using Relevance Feedback and Risk Minimization. *Int. Journal of Computer Vision (IJCV)*, Special Issue on 3D Object Retrieval, vol. 89, no. 2-3, pp. 392-407, 2010. (IJCV impact factor 5.36 was in 2010, #2 in all engineering and AI)
3. **C. B. Akgül**, B. Sankur, Y. Yemez, F. Schmitt. 3D Model Retrieval using Probability Density-Based Shape Descriptors. *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)*, vol. 31, no. 6, pp. 1117-1133, June 2009. (IJCV impact factor was 5.96 in 2010, #1 in all engineering and AI)
4. **C. B. Akgül**, B. Sankur, Y. Yemez, F. Schmitt. Density-Based 3D Shape Descriptors. *EURASIP Journal on Advances in Signal Processing*, vol. 2007, Article ID 32503, 16 pages, 2007.
5. **C. B. Akgül**, B. Sankur, A. Akin. Extraction of cognitive activity related waveforms from functional near infrared spectroscopy signals. *Medical & Biological Engineering & Computing*, vol. 44, pp. 945-958, November 2006.
6. **C. B. Akgül**, B. Sankur, A. Akin. Spectral analysis of event-related hemodynamic responses in functional near infrared spectroscopy. *Journal of Computational Neuroscience*, vol. 18, pp. 67-83, January 2005.

PATENT

C. B. Akgül, A. Ekin. Relevance Feedback for Content-Based Image Retrieval. *WIPO Patent Application WO/2011/001331*, International Class G06F17/30, filing date 23-June-2010, publication date 06-Jan-2011.

IN PROCEEDINGS (INTERNATIONAL)

1. S. Aslan, **C. B. Akgül**, B. Sankur, and E. T. Turhanli. SymPaD: Symbolic Patch Descriptor. In 10th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISAPP 2015), accepted, Berlin, Germany, March 11-14, 2015.
2. S. Aslan, **C. B. Akgül**, and B. Sankur. Semantic interest point detection for image classification and interpretation. In IS&T/SPIE Electronic Imaging 2014: Image Processing: Machine Vision Applications VII, accepted, 2014.
3. O. Celiktutan, **C. B. Akgül**, C. Wolf and B. Sankur. Graph-Based Analysis of Physical Exercise Actions. In 1st ACM MM Workshop on Multimedia Indexing and information Retrieval for Healthcare: held in conjunction with ACM MM 2013, Barcelona, Spain, October 21-25, 2013.
4. N. B. Marvasti, **C. B. Akgül**, N. Kökciyan, S. Üsküdarlı, P. Yolum, R. Turkey, B. Bakir and B. Acar. Clinical Experience Sharing by Similarity Case Retrieval. In 1st ACM MM Workshop on Multimedia Indexing and information Retrieval for Healthcare: held in conjunction with ACM MM 2013, Barcelona, Spain, October 21-25, 2013.
5. C. Sari, **C. B. Akgül**, B. Sankur. Combination of Gross Shape Features, Fourier Descriptors and Multiscale Distance Matrix for Leaf Recognition. In 55th International Symposium ELMAR-2013, Zadar, Croatia, September 25-27, 2013.
6. F. Negin, F. Ozdemir, **C. B. Akgül**, K. A. Yüksel, A. Ercil. A Decision Forest Based Feature Selection Framework for Action Recognition from RGB-Depth Cameras. In International Conference on Image Analysis and Recognition / Special Session: Recent Advances on RGB-D Camera Applications, Póvoa de Varzim, Portugal, June 26-28, 2013.

7. **C. B. Akgül**, B. Acar. Future PACS for decision support: content-based case retrieval. *In International Hospital Vol 38*, March/April 2012.
8. A. Sokmenoglu, **C. B. Akgül**. Exploring the Patterns and Trends of Socio-spatial Activities of Architecture Student Community in Istanbul by Data Mining. *In Proc. of the eCAADe Conf.*, Zurich, Switzerland, September 2010.
9. **C. B. Akgül**, A. Ekin. A Probabilistic Information Fusion Approach to MR-Based Automated Diagnosis of Dementia. *In Int. Conf. on Pattern Recognition (ICPR)*, Istanbul, Turkey, August 2010.
10. **C. B. Akgül**, B. Sankur, Y. Yemez. Correspondence-Free Alignment of 3D Object Models. *In SPIE Conf. on 3D Image Processing (3DIP) and Applications*, San Jose, USA, January 2010.
11. **C. B. Akgül**, D. Unay, A. Ekin. Automated Diagnosis of Alzheimer's Disease using Image Similarity and User Feedback. *In ACM CIVR'09*, Santorini, Greece, July 2009.
12. A. Godil, H. Dutagaci, **C. B. Akgül** et al. SHREC 2009 – Generic Shape Retrieval Contest. *In Eurographics Workshop on 3D Object Retrieval*, I. Pratikakis, M. Spagnuolo, T. Theoharis, and R. Veltkamp (Editors), March 2009.
13. **C. B. Akgül**, B. Sankur, Y. Yemez, F. Schmitt. Similarity Score Fusion by Ranking Risk Minimization for 3D Object Retrieval. *In Eurographics Workshop on 3D Object Retrieval*, Crete, Greece, April 2008.
14. **C. B. Akgül**, B. Sankur, F. Schmitt, Y. Yemez. Multivariate Density-Based 3D Shape Descriptors. *In IEEE Shape Modeling International'07*, Lyon, France, June 2007.
15. **C. B. Akgül**, F. Schmitt, B. Sankur, Y. Yemez. Multivariate Density-Based 3D Shape Descriptors. *In SHREC 2007: Shape Retrieval Contest*, Technical Report UU-CS-2007-015, R.C. Veltkamp and F. B. ter Haar (Editors), June 2007.
16. **C. B. Akgül**, B. Sankur, Y. Yemez, F. Schmitt. Improving Efficiency of Density-Based Shape Descriptors for 3D Object Retrieval. *In MIRAGE'07*, Springer LNCS Series, vol. 4418, pp. 330-340, INRIA Rocquencourt, France, March 2007.
17. D. Lesage, J. Darbon, **C. B. Akgül**. An Efficient Algorithm for Connected Attribute Thinnings and Thickenings. *In ISVC'06*, Springer LNCS Series, vol. 4292, pp. 393-404, Lake Tahoe, Nevada, USA, November 2006.
18. **C. B. Akgül**, B. Sankur, F. Schmitt, Y. Yemez. Density-based Shape Descriptors for 3D Object Retrieval. *In MRCS'06*, Springer LNCS Series, vol. 4105, pp. 322-329, Istanbul, Turkey, September 2006.
19. **C. B. Akgül**, B. Sankur, Y. Yemez, F. Schmitt. A Framework for Histogram-Induced 3D Descriptors. *In EUSIPCO'06*, Florence, Italy, September 2006.
20. **C. B. Akgül**, B. Sankur, A. Akin. Extraction of cognitive activity related waveforms from functional near infrared signals. *In EUSIPCO'06*, Florence, Italy, September 2006.
21. J. Darbon, **C. B. Akgül**. An Efficient Algorithm for Attribute Openings and Closings. *In EUSIPCO'05*, Antalya, Turkey, September 2005.
22. **C. B. Akgül**, B. Sankur, A. Akin. Evidence of cognitive activity in functional near infrared spectroscopy signal. *In OSA Optical Techniques in Neuroscience Topical Meeting*, Miami Beach, Florida, USA, April 2004.
23. U. E. Emir, **C. B. Akgül**, A. Akin, A. Ertüzün, B. Sankur, K. Harmanci. Wavelet Denoising vs. ICA Denoising for Functional Optical Imaging. *In Int. Conf. on Neural Engineering*, Capri, Italy, March 2003.

IN PROCEEDINGS (NATIONAL)

1. S. Öztürk, B. Sankur, **C. B. Akgül**. People Detection in Cluttered Scenes. 18. IEEE Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU'10), Diyarbakır, Nisan 2010.
2. **C. B. Akgül**, D. Ünay, A. Ekin. Diagnosis of Alzheimer's Disease from MR Images using Relevance Feedback. 17. IEEE Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU'09), Antalya, Nisan 2009.

3. **C. B. Akgül**, B. Sankur, Y. Yemez. Statistical Score Fusion for 3D Object Retrieval. 16. IEEE Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU'08), Didim, Nisan 2008.
4. **C. B. Akgül**, B. Sankur, Y. Yemez, F. Schmitt. Feature-Level and Descriptor-Level Information Fusion for Density-Based 3D Shape Descriptors. 15. IEEE Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU'07), Eskişehir, Haziran 2007.
5. **C. B. Akgül**, B. Sankur, Y. Yemez, F. Schmitt. A New Computational Framework for 3D Shape Descriptors. 14. IEEE Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU'06), Antalya, Nisan 2006.
6. **C. B. Akgül**, B. Sankur, F. Schmitt, Y. Yemez. 3D Object Matching via Multivariate Shape Distributions. 13. IEEE Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU'05), Kayseri, Mayıs 2005.
7. **C. B. Akgül**, B. Sankur, A. Akın. Evidence of Cognitive Activity in Functional Optical Signals. 12. IEEE Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU'04), Kuşadası, Nisan 2004.
8. **C. B. Akgül**, B. Sankur, A. Akın. Extraction of Cognitive Activity Related Waveforms from Functional Optical Signals. 12. IEEE Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU'04), Kuşadası, Nisan 2004.
9. E. Yörük, **C. B. Akgül**. Color Image Segmentation Using PDE-based Regularization and Watershed Transformation. 12. IEEE Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU'04), Kuşadası, Nisan 2004.
10. **C. B. Akgül**. Sualtı Fotoğraflarından Bilgisayar Destekli Balık Tanıma. 7. Sualtı Bilim ve Teknolojisi Toplantısı, Uludağ Üniversitesi, Aralık 2003.
11. **C. B. Akgül**, B. Sankur, A. Akın. İşlevsel Optik Görüntülemeye Zamansal Olay Sezimi. 11. Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU'03), İstanbul, Haziran 2003.