Hasan Ertan Çetingül, Ph.D.

Contact Information

Siemens Healthcare
755 College Road East
Princeton, NJ 08540, USA

Web: www.cis.jhu.edu/∼ertan
E-mail: ertan.cetingul@gmail.com
Phone: (443)710-2092

Summary

- Staff Scientist with experience in signal/image processing, computer vision, machine learning, compressed sensing, and statistical modeling, focusing on applications in biometrics, dynamic scene analysis, data classification/clustering, and medical image analysis.
- Certified Project Manager for R&D projects funded by CT and MR business units.
- Team Leader in cross-functional teams to develop algorithms and to generate prototype concept and intellectual property for new data processing and understanding tools.
- Several years of academic and industrial experience in the areas of signal/image processing (12+ years), computer vision & machine learning (10+ years), medical image analysis (7+ years), neuroimaging (7+ years), and compressed sensing (6+ years).

Education

Johns Hopkins University (JHU), Baltimore MD, USA — 09/2005 - 09/2011
Ph.D., Biomedical Engineering

Koç University, Istanbul, Turkey — 09/2003 - 07/2005
M.S., Electrical & Computer Engineering

Middle East Technical University (METU), Ankara, Turkey — 09/1998 - 06/2003
B.S., Electrical & Electronics Engineering (GPA: 3.73/4.00)
Minor, Business Administration (GPA: 3.35/4.00)

Industrial Experience

Siemens Healthcare, Princeton NJ, USA — 05/2009 - Present
Staff Scientist in Medical Imaging Technologies (MIT) — 01/2015 - Present
Research Scientist in Imaging & Computer Vision (ICV) — 10/2011 - 12/2014
Intern in Imaging & Visualization — 05/2009 - 09/2009

- Developing methods for preprocessing (image correction and standardization) and automated abnormality detection in multi-contrast brain MR images.
- Developing neuroimaging tools to study brain connectivity and its impairment from low-level processing (biomarker generation) to high-level analysis (diagnostic classification).
- Developing MR and CT reconstruction methods using manifold learning and sparsity.
- Holding the role of the inventor in invention disclosures (24+) and patents (9), and the role of the investigator in preparation and execution of government projects (NIH R01 EB008432: HARDI mapping of disease effects on the brain; NIH R01 CA172210: Multi-parametric volumetric MR characterization of intracranial lesions; IARPA KRNS: A modern approach to conceptual knowledge employment and representation enhanced by learning).
- (Internship) Developed algorithms to improve minimal path-type tracking and segmentation of coronary arteries in CE-CTA/MRA data.

MED-EL Inc., Innsbruck, Austria — 08/2002 - 09/2002
Intern in Test Department

Philips Healthcare, Izmir, Turkey — 06/2002 - 07/2002
Intern in Customer Service & Maintenance

Aselsan Inc., Ankara, Turkey — 06/2001 - 07/2001
Intern in Public Communication Systems

Academic Experience

Johns Hopkins University, Baltimore MD, USA — 09/2005 - 09/2011
Research Assistant in Vision, Dynamics & Learning Lab

- Developed mathematical methods that make use of sparse representation theory and Riemannian geometry for processing (averaging, interpolation, filtering), segmentation, and alignment of HARDI data described by orientation distribution functions.
- Developed deterministic/stochastic tractography techniques in 3-D images by using a novel multi-scale local orientation descriptor: Applications to cardiac Purkinje fibers in highresolution MRI (NIH R01 HL082729: Defibrillation mechanisms in infarcted hearts).
- Developed a mean shift formulation for clustering on Stiefel and Grassmann manifolds with applications on object categorization and motion segmentation.
- Developed a system theoretic approach for speaker recognition and synthesize visual speech from lip articulation.

Koç University, Istanbul, Turkey 09/2003 - 07/2005
Research Assistant in Multimedia, Vision & Graphics Lab

- Developed a two-stage discriminative analysis technique to determine optimal lip motion features for speaker identification and speech-reading and contributed to European FP6 Network of Excellence SIMILAR project on human-computer interaction.

Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland 08/2004
Visiting Researcher in Signal Processing Laboratory 5

Publications & Patents

Journal Articles

1. K.H. Maier-Hein et al. *Large-scale evaluation of white matter tractography: an open computational problem?* (**submitted to Nature Methods**)
2. **H.E. Çetingül**, B. Afsari, and R. Vidal. *Processing of high angular resolution diffusion MRI via group action induced averaging of orientation distribution functions.* (**in prep**)
3. **H.E. Çetingül**, A. Demir, M. Nadar, P.M. Thompson, G. Sapiro, and C. Lenglet. *Unified ODF estimation and improved filtered probabilistic tractography in HARDI.* (**in prep**)
4. A. Demir and **H.E. Çetingül**. *Sequential hierarchical agglomerative clustering of white matter fiber pathways.* IEEE Trans. on Biomedical Engineering, vol. 62, no. 6, pp. 1478-1489, June 2015.
5. **H.E. Çetingül**, M.J. Wright, P.M. Thompson, and R. Vidal. *Segmentation of high angular resolution diffusion MRI using sparse Riemanian manifold clustering.* IEEE Trans. on Medical Imaging, vol. 33, no. 2, pp. 301–317, February 2014.
6. X. Lu, P. Speier, M.-P. Jolly, **H.E. Çetingül**, M. Schmidt, C. Guetter, C. Hayes, A. Littmann, Q. Wang, M. Nadar, F. Sauer, and E. Mueller. *Time-resolved 3D-CMR using free-breathing 2D acquisitions.* Journal of Cardiovascular Magnetic Resonance, Vol. 16 (Suppl 1), pp. 50, January 2014.
7. **H.E. Çetingül**, G. Plank, N. Trayanova, and R. Vidal. *Estimation of local orientations in fibrous structures with applications to the Purkinje system.* IEEE Trans. on Biomedical Engineering, vol. 58, no. 6, pp. 1762–1772, June 2011.
8. **H.E. Çetingül**, E. Erzin, Y. Yemez, and A.M. Tekalp. *Multimodal speaker/speech recognition using lip motion, lip texture and audio.* Signal Processing, Special Section: Multimodal Human-Computer Interfaces, vol. 86, no. 12, pp. 3549–3558, December 2006.
9. **H.E. Çetingül**, Y. Yemez, E. Erzin, and A.M. Tekalp. *Discriminative analysis of lip motion features for speaker identification and speech-reading.* IEEE Trans. on Image Processing, vol. 15, no. 10, pp. 2879–2891, October 2006.

Patents and Patent Applications

1. E. Schwab, **H.E. Çetingül**, B. Mailhe, and M. Nadar. *Sparse recovery of fiber orientations using multidimensional prony method.* Ref no. 2016P02729US. (filed)
2. **H.E. Çetingül**, B. Odry, and M. Nadar. *A framework for abnormality detection in multicontrast brain magnetic resonance data.* Ref no. 2015P15026US. (filed)

3. B. Odry and **H.E. Çetingül**. *Modular automated scoring system for TBI assessment*. Ref no. 2015P03974US. (filed)
4. S. Rapaka, **H.E. Çetingül**, F. Pereira, D. Comaniciu, and A.G. Sorensen. *Subject-specific assessment of neurological disorders*. Ref no. 2015P01204US. (filed)
5. **H.E. Çetingül**, S. Sudarsky, I. Borgohain, T. Allmendinger, B. Schmidt, and M. Charikleia-Pilatou. *Computed tomography data-based cycle estimation and four-dimensional reconstruction*. US Patent App. US20160113614; April 28, 2016.
6. F. Pereira, B. Odry, **H.E. Çetingül**. *Assessment of traumatic brain injury*. US Patent US9265441B2; granted February 23, 2016.
7. **H.E. Çetingül**. *Resolution enhancement of diffusion imaging biomarkers in magnetic resonance imaging*. US Patent App. US20150198688; July 16, 2015.
8. **H.E. Çetingül**, M. Nadar, M. Schmidt, and P. Speier. *Magnetic resonance imaging with asymmetric radial sampling and compressed-sensing reconstruction*. US Patent App. US20150126850; May 7, 2015.
9. X. Lu, P. Speier, **H.E. Çetingül**, M.-P. Jolly, M. Schmidt, C. Guetter, C. Hayes, A. Littmann, H. Xue, M. Nadar, F. Sauer, and E. Mueller. *MRI 3D cine imaging based on intersecting source and anchor slice data*. US Patent App. US20150091563; April 2, 2015.
10. M. Nadar, X. Bian, Q. Wang, **H.E. Çetingül**, H. Krim, and L. Plaetevoet. *Robust subspace recovery via dual sparsity pursuit*. US Patent App. US20150063687; March 5, 2015.

Theses and Book Chapters

1. **H.E. Çetingül**. *Processing and segmentation of high angular resolution diffusion images described by orientation distribution functions*. Ph.D. Thesis, Biomedical Engineering, Johns Hopkins University, September 2011.
2. **H.E. Çetingül**, E. Erzin, Y. Yemez, and A.M. Tekalp. *Multimodal speaker identification using discriminative lip motion features*. In A. Liew, S. Wang (Eds.), Visual Speech Recognition: Lip Segmentation and Mapping, pp. 463–494, IGI Global, 2009.
3. **H.E. Çetingül**. *Discrimination analysis of lip motion features for multimodal speaker identification and speech-reading*. M.S. Thesis, Electrical & Computer Engineering, Koç University, July 2005.

Selected Conference and Workshop Papers

1. Y. Jin and **H.E. Çetingül**. *Tractography-embedded white matter stream clustering*. IEEE Int. Symp. on Biomedical Imaging (ISBI'15), pp. 432–435, New York, NY, April 2015.
2. A. Demir, A. Mohamed, and **H.E. Çetingül**. *Online agglomerative hierarchical clustering of neural fiber tracts*. Int. Conf. of the IEEE Engineering in Medicine and Biology Society (EMBC'13), pp. 85–88, Osaka, Japan, July 2013.
3. E. Schwab, **H.E. Çetingül**, B. Afsari, M.A. Yassa, and R. Vidal. *Rotation invariant features for HARDI*. Int. Conf. on Information Processing in Medical Imaging (IPMI'13), LNCS 7917, pp. 705–717, Asilomar, CA, July 2013.
4. F. Pereira, J. Walz, **H.E. Çetingül**, S. Sudarsky, M. Nadar, and R. Prakash. *Creating group-level functionally-defined atlases for diagnostic classification*. Int. Workshop on Pattern Recognition in NeuroImaging (PRNI'13), pp. 29–32, Philadelphia, PA, June 2013.
5. **H.E. Çetingül**, L. Dumont, M. Nadar, P. Thompson, G. Sapiro, and C. Lenglet. *Importance sampling spherical harmonics to improve probabilistic tractography*. Int. Workshop on Pattern Recognition in NeuroImaging (PRNI'13), pp. 46–49, Philadelphia, PA, June 2013.
6. **H.E. Çetingül**, L. Dumont, M. Nadar, P.M. Thompson, G. Sapiro, and C. Lenglet. *Simultaneous ODF estimation and robust probabilistic tractography from HARDI*. Computational Diffusion MRI (CDMRI'12) Workshop at MICCAI'12, pp. 13–24, Nice, France, October 2012.

7. **H.E. Çetingül**, M. Nadar, P.M. Thompson, G. Sapiro, and C. Lenglet. *Simultaneous ODF estimation and tractography in HARDI*. Int. Conf. of the IEEE Engineering in Medicine and Biology Society (EMBC'12), pp. 86–89, San Diego, CA, August 2012.
8. **H.E. Çetingül**, B. Afsari, M.J. Wright, P.M. Thompson, and R. Vidal. *Group action induced averaging for HARDI processing*. IEEE Int. Symp. on Biomedical Imaging (ISBI'12), pp. 1389–1392, Barcelona, Spain, May 2012.
9. **H.E. Çetingül**, B. Afsari, and R. Vidal. *An algebraic solution to rotation recovery in HARDI from correspondences of orientation distribution functions*. IEEE Int. Symp. on Biomedical Imaging (ISBI'12), pp. 38–41, Barcelona, Spain, May 2012.
10. **H.E. Çetingül** and R. Vidal. *Sparse Riemannian manifold clustering for HARDI segmentation*. IEEE Int. Symp. on Biomedical Imaging (ISBI'11), pp. 1750–1753, Chicago, IL, April 2011.
11. M. Pirtini Çetingül, **H.E. Çetingül**, and C. Herman. *Analysis of transient thermal images to distinguish melanoma from dysplastic nevi*. Proc. of SPIE Medical Imaging, vol. 7963, Lake Buena Vista, FL, February 2011.
12. **H.E. Çetingül**, M.A. Gülsün, and H. Tek. *A unified minimal path tracking and topology characterization approach for vascular analysis*. H. Liao et al. (Eds.): Medical Imaging and Augmented Reality (MIAR'10), Beijing, China, September 2010, LNCS 6326, pp. 11–20. Springer, Heidelberg 2010.
13. **H.E. Çetingül**, G. Plank, N. Trayanova, and R. Vidal. *Stochastic tractography in 3-D images via nonlinear filtering and spherical clustering*. Probabilistic Models for Medical Image Analysis (PMMIA'09) Workshop at MICCAI'09, pp. 268–279, London, UK, September 2009.
14. **H.E. Çetingül**, G. Plank, N. Trayanova, and R. Vidal. *Estimation of multimodal orientation distribution functions from cardiac MRI to track Purkinje fibers through branchings*. IEEE Int. Symp. on Biomedical Imaging (ISBI'09), pp. 839–842, Boston, MA, June 2009.
15. **H.E. Çetingül**, and R. Vidal. *Intrinsic mean shift for clustering on Stiefel and Grassmann manifolds*. IEEE Int. Conf. on Computer Vision and Pattern Recognition (CVPR'09), pp. 1896–1902, Miami Beach, FL, June 2009.
16. **H.E. Çetingül**, R. Vidal, G. Plank, and N. Trayanova. *Nonlinear filtering for extracting orientation and tracing tubular structures in 2-D medical images*. IEEE Int. Symp. on Biomedical Imaging (ISBI'08), pp. 260–263, Paris, France, May 2008.
17. **H.E. Çetingül**, R. Chaudhry, and R. Vidal. *A system theoretic approach to synthesis and classification of lip articulation*. Int. Workshop on Dynamical Vision (WDV'07) at ICCV'07, Rio de Janeiro, Brazil, October 2007.
18. **H.E. Çetingül**, E. Erzin, Y. Yemez, and A.M. Tekalp. *Use of lip information for robust speaker identification and speech recognition*. Biennial on DSP for In-Vehicle and Mobile Systems, Sesimbra, Portugal, September 2005.
19. **H.E. Çetingül**, Y. Yemez, E. Erzin, and A.M. Tekalp. *Robust lip-motion features for speaker identification*. IEEE Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP'05), Vol. 1, pp. 509–512, Philadelphia, PA, March 2005.
20. **H.E. Çetingül**, Y. Yemez, E. Erzin, and A.M. Tekalp. *Discriminative lip-motion features for biometric speaker identification*. IEEE Int. Conf. on Image Processing (ICIP'04), Vol. 3, pp. 2023–2026, Singapore, October 2004.
21. **H.E. Çetingül**, E. Erzin, Y. Yemez, and A.M. Tekalp. *On optimal selection of lip-motion features for speaker identification*. IEEE Workshop on Multimedia Signal Processing (MMSP'04), pp. 7–10, Siena, Italy, September 2004.

Selected Abstracts

1. Y. Liu, B. Odry, **H.E. Çetingül**, and M. Nadar. *A generic supervised learning framework for fast brain extraction*. The Int. Soc. for Magnetic Resonance in Medicine (ISMRM) Annual Meeting, Singapore, May 2016.

2. E. Schwab, **H.E. Çetingül**, R. Vidal, and M. Nadar, *Using a hyperspherical harmonic basis for sparse multi-voxel modeling of diffusion MRI*. The Int. Soc. for Magnetic Resonance in Medicine (ISMRM) Annual Meeting, Singapore, May 2016.
3. S. Chen, **H.E. Çetingül**, X. Hu, M. Nadar. *Resting state network detection with searchlight on functional MRI*. The Int. Soc. for Magnetic Resonance in Medicine (ISMRM) Annual Meeting, Toronto, Canada, June 2015.
4. F. Pereira, **H.E. Çetingül**, D. Little, and B. Odry. *Imaging-based classifier as synthetic biomarker for TBI patients*. IEEE EMBS BRAIN Grand Challenges Conference, Washington, DC, November 2014.
5. **H.E. Çetingül** and M. Nadar. *Towards super-resolved DTI biomarkers using a disjoint shape-orientation analysis of tensors*. Organization for Human Brain Mapping (OHBM) Annual Meeting, Hamburg, Germany, June 2014.
6. **H.E. Çetingül**, P. Speier, M. Schmidt, Q. Wang, and M. Nadar. *Compressed sensing reconstructed radial bSSFP with asymmetric views for free-breathing cardiac cine MRI*. The Int. Soc. for Magnetic Resonance in Medicine (ISMRM) Annual Meeting, Milan, Italy, May 2014.
7. Q. Wang, M. Zenge, **H.E. Çetingül**, E. Mueller, and M. Nadar. *Novel sampling strategies for sparse MR image reconstruction*. The Int. Soc. for Magnetic Resonance in Medicine (ISMRM) Annual Meeting, Milan, Italy, May 2014.
8. X. Lu, P. Speier, **H.E. Çetingül**, M.-P. Jolly, M. Schmidt, M. Nadar, F. Sauer, and E. Mueller. *Reconstructing 3D dynamics based on complementary 2D acquisitions: a preliminary case study on speech imaging*. The Int. Soc. for Magnetic Resonance in Medicine (ISMRM) Annual Meeting, Milan, Italy, May 2014.
9. F. Pereira, **H.E. Çetingül**, S.M. Stark, C.E. Stark, M.A. Yassa, and M. Nadar. *Age classification using structural and functional connectivity*. Organization for Human Brain Mapping (OHBM) Annual Meeting, Seattle, WA, June 2013.

Skills

Operating systems: MS Windows, Linux, Mac OS

Tools & Programming: C/C++, Matlab/Octave, Python, Shell script, MeVisLab, NeuroDebian, Caffe, Theano/Lasagne.

Languages: English (fluent), French (advanced), Turkish (native)

Professional Activities

Reviewer: IEEE (TMI, TPAMI, TIP, TBME), Elsevier (CMPB, INS), Eurasip ASP, MICCAI (2011-2016), CVPR (2013-2016), ICCV (2013-2016), ISBI (2014-2016)

Member: IEEE, ISMRM, OHBM

PC Member: Workshop on Medical Computer Vision (MICCAI'13, '14)

Honors & Awards

- Article featured in IEEE Trans. on Biomedical Engineering, 2015
- Research on TBI highlighted in SiemensWorld News, 2014
- ISBI travel grant award (for top student papers submitted to ISBI'08), NIH, 2008
- Graduate Representative Organization (GRO) travel award, JHU, 2007
- Ph.D. study fellowship in biomedical engineering, JHU, 2005
- M.S. study merit scholarship, TUBITAK, 2005
- Vehbi Koç scholarship for graduate study, Koç University, 2003
- Ranked 15th in graduating class among 209 seniors, METU, 2003
- Best senior design project award, Electrical & Electronics Engineering, METU, 2003
- High honors' list (6 semesters), Honors' list (2 semesters), Electrical & Electronics Engineering, METU, 1999-2003
- Ranked 604th among ∼1.5 million high school seniors in university entrance exam, 1998
- Valedictorian, Izmir Saint Joseph French High School, 1998