

ILKAY OKSUZ

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Biomedical Engineering Department
King's College London
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PROFILE

Currently, I am a member of the The Motion Modelling and Analysis group in King's College London. I finished my studies as a Ph.D. candidate in Computer, Decision and Systems Science at IMT Institute for Advanced Studies, Lucca, Italy, and therein a research associate of the unit PRIAn (Pattern Recognition and Image Analysis). My main research interests are in image quality assessment, segmentation, registration and machine learning, with a certain focus on medical image analysis. My Ph.D. studies focus on cardiac phase resolved Blood-Oxygen-Level-Dependent (BOLD) MR. I work on joint registration and segmentation of the myocardium in MR sequences.

EDUCATION

Research Associate,

Biomedical Engineering Department
King's College London, London, UK

August 2017-present

Visiting Post-graduate Student,

Institute for Digital Communications
The University of Edinburgh, Edinburgh, UK

January 2017-July 2017

Doctor of Philosophy,

Computer, Decision and Systems Science
IMT Institute for Advanced Studies, Lucca, Italy

November 2013-December 2017

Thesis: Joint Registration and Segmentation of the Myocardium in Varying Contrast Images

Visiting Post-graduate Student,

Diagnostic Radiology Department
Yale University, New Haven, Connecticut, USA

November 2015-September 2016

Master of Science,
Electrical and Electronics Engineering
Bahcesehir University, Istanbul, Turkey
Thesis: 3D Vessel Segmentation and Analysis in Coronary CT Angiography Images

October 2013

Bachelor of Science,
Electronics Engineering
Istanbul Technical University, Istanbul, Turkey

September 2010

Erasmus Exchange Student,
Electronics Engineering
Darmstadt Technical University, Darmstadt, Germany

September 2009

PUBLICATIONS

- **Oksuz, I.** Ruijsink B., Puyol-Anton E., Sinclair M., Rueckert D., Schnabel J., King A.P., Automatic Left Ventricular Outflow Tract Classification For Accurate Cardiac MR Planning, ISBI, 2018, (accepted) **Preprint**
- **Oksuz, I.**, Dharmakumar, R., Tsaftaris, S.A., “Joint Myocardial Registration and Segmentation of Cardiac BOLD MRI”, Statistical Atlases and Computational Models of the Heart (STACOM), 2017, (best paper award) **PDF**
- **Oksuz, I.**, Mukhopadhyay A., Dharmakumar, R., Tsaftaris, S.A., “Unsupervised Myocardial Segmentation for Cardiac BOLD”, IEEE Transactions on Medical Imaging (TMI) 2017 , to appear. **PDF**
- Yang H.S.*, **Oksuz, I.***, Klein M., Sobczyk O., Dey D., Sykes J., Butler J., Bi X., Sharif B., Cokic I., Li, D., Slomka D., Prato F.S., Fisher J., Tsaftaris S.A., Dharmakumar, R., “Cardiac fMRI - A Novel Approach for Reliably Detecting Myocardial Oxygenation Changes with Precise Modulation of Arterial CO₂”, International Society of Magnetic Resonance in Medicine Meeting (ISMRM), 2017. (accepted for power pitch presentation) **PDF**
- Suinesiaputra A., Ablin P., Alba X., Alessandrini M., Allen J., Bai W., Cimen S., Claes P., Cowan P., Dhooge J., Duchateau N., Ehrhardt J., Frangi A.F., Gooya A., Grau V., Lekadir K., Lu A., Mukhopadhyay A., **Oksuz I.**, Parajuli N., Pennec X., Pereanez M., Pinto C., Piras P., Rohe M., Rueckert D., Saring D., Sermesant M., Siddiqi K., Tabassian M., Teresi L., Tsaftaris S.A., Wilms m., Young A.A., Zhang X., Gracia P.M., ‘Statistical shape modeling of the left ventricle: myocardial infarct classification challenge’, IEEE JBHI 2017 (accepted), **Online PDF**
- **Oksuz, I.**, Dharmakumar, R., Tsaftaris S.A., “Fully automated myocardial segmentation of cardiac BOLD MRI”, International Society of Magnetic Resonance in Medicine Meeting (SCMR), 2017. **Online PDF**

- **Oksuz, I.**, Dharmakumar, R., Tsaftaris S.A., “Multi-Resolution Registration and Segmentation for cardiac BOLD MRI”, International Society of Magnetic Resonance in Medicine Meeting (ISMRM), 2016. (oral presentation) **Online PDF**
- **Oksuz, I.**, Bevilacqua, M., Mukhopadhyay, A., Dharmakumar, R., Tsaftaris, S.A., “BOLD contrast: A challenge for cardiac image analysis”, Society for Cardiovascular Magnetic Resonance Annual Meeting, 2016. **Online PDF**
- **Oksuz, I.**, Dharmakumar, R., Tsaftaris, S.A., “Towards joint segmentation and registration of the myocardium in CP-BOLD MRI at rest”, Society for Cardiovascular Magnetic Resonance Annual Meeting, 2016.**Online PDF**
- Mukhopadhyay, A., **Oksuz, I.**, Tsaftaris, S.A., “Supervised Learning of Functional Maps for Infarct Classification”, Statistical Atlases and Computational Models of the Heart (STACOM), 2015. **Online PDF**
- **Oksuz, I.**, Mukhopadhyay, A., Bevilacqua, M., Dharmakumar, R., Tsaftaris, S.A., “Dictionary Learning Based Image Descriptor for Myocardial Registration of CP-BOLD MR”, Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2015. **Online PDF**
- Mukhopadhyay, A., **Oksuz, I.**, Bevilacqua, M., Dharmakumar, R., Tsaftaris, S.A., “Unsupervised myocardial segmentation for cardiac MRI”, Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2015. **Online PDF**
- **Oksuz, I.***, Mukhopadhyay, A.*, Bevilacqua, M., Dharmakumar, R., Tsaftaris, S.A., “Data-Driven Feature Learning for Myocardial Segmentation of CP-BOLD MR”, Functional Imaging and Modeling of Heart (FIMH), 2015.(oral presentation) **Online PDF**
- **Oksuz, I.**, Mukhopadhyay, A., Bevilacqua, M., Yang H.J., Dharmakumar, R., Tsaftaris S.A., “Effect of BOLD Contrast on Myocardial Registration”, International Society of Magnetic Resonance in Medicine Meeting (ISMRM), 2015. **Online PDF**
- Mukhopadhyay, A., Bevilacqua, M., **Oksuz, I.**, Dharmakumar, R., Tsaftaris, S.A., “Data Driven Feature Learning For Representation of Myocardial BOLD MR Images”, International Society of Magnetic Resonance in Medicine Meeting (ISMRM), 2015. **Online PDF**
- Bevilacqua, M., Mukhopadhyay, A., **Oksuz, I.**, Rusu C., Dharmakumar, R., Tsaftaris S.A., “Dictionary-based Support Vector Machines for Unsupervised Ischemia Detection at Rest with CP-BOLD Cardiac MRI”, International Society of Magnetic Resonance in Medicine Meeting (ISMRM), 2015. **Online PDF**
- Rudyanto, R.D., Kerkstra, S., van Rikxoort, E.M., Fetita, C., Brillet, P., Lefevre, C., Xue, W.,Zhu, X.,Liang, J., **Oksuz, I.**, Unay, D., Kadipasaoglu, K.,Estpar, R., Ross, J.C., Washko, G. R.,Prieto, J., Hoyos, Marcela H., Orkisz, M., Meine, H., Hillebrand, M., Stcker, C.,Mir, F.,Naranjo, V., Villanueva, E., Staring, M., Xiao, C., Stoel, B.C., Fabijanska, A., Smistad, E., Elster, Anne C., Lindseth, F., Foruzan, A., Kiros, R.,Popuri, K.,Cobzas, D., Jimenez-Carretero, D., Santos, A., Ledesma-Carbayo, M.J., Helmberger, M., Urschler, M., Pienn, M., Bosboom, D.G.H., Campo, A., Prokop, M.,de Jong, P.A.,Ortiz-de-Solorzano, C., Muoz-Barrutia, A., van Ginneken, B., “Comparing algorithms for automated vessel segmentation in computed tomography scans of the

lung: the VESSEL12 study”, Medical Image Analysis, 18 (7). pp. 1217-1232. ISSN 1361-8415, 2014. **Online PDF**

- Kirisli, H.A., Schaap, M., Metz, C.T., Dharampal, A.S., Meijboom, W.B., Papadopoulou, S. L., Dedic, A., Nieman, K., de Graaf, M.A., Meijs, M.F.L., Cramer, M.J., Broersen, A., Cetin, S., Eslami, A., Flrez-Valencia, L., Lor, K.L., Matuszewski, B., Melki, I., Mohr, B., **Oksuz, I.**, Shahzad, R., Wang, C., Kitslaar, P.H., Unal, G., Katouzian, A., Orkisz, M., Chen, C.M., Precioso, F., Najman, L., Masood, S., Unay, D., van Vliet, L., Moreno, R., Goldenberg, R., Vucini, E., Krestin, G.P., Niessen, W.J., van Walsum, T., “Standardized Evaluation Framework for Evaluating Coronary Artery Stenosis Detection, Stenosis Quantification and Lumen Segmentation Algorithms in Computed Tomography Angiography, Medical Image Analysis, 17 (8). pp. 859-876. ISSN 1361-841, 2013. **Online PDF**
- **Oksuz, I.**, Unay, D., Kadipasaoglu, K., “Region Growing on Frangi Vesselness Values in 3-D CTA Data”, Proceedings of the 21st Signal Processing and Communications Applications Conference (SIU). IEEE, pp. 1-4. ISBN 978-1-4673-5561-2, 2013. **Online PDF**
- Unay, D., Harmankaya, I., **Oksuz, I.**, Kadipasaoglu, K., Cubuk, R., Celik, L., “Automated aortic supravalvular sinus detection in conventional computed tomography image”, In: Proceedings of the 21st Signal Processing and Communications Applications Conference (SIU). IEEE, pp. 1-4. ISBN 978-1-4673-5561-2, 2013. **Online PDF**
- **Oksuz, I.**, Unay, D., Kadpasaoglu, K., “A Hybrid Method for Coronary Artery Stenosis Detection and Quantification in CTA Images”, Workshop on 3D Cardiovascular Imaging: A MICCAI Segmentation Challenge, Proc. 15th Int. Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), Nice - France, 2012. **Online PDF**
- **Oksuz, I.**, Unay, D., Kadipasaoglu, K., “Multi-scale Hessian Based Approach of Lung Vessel Tree in 3-D CTA Data” : A ISBI Segmentation Challenge, Proc. of International Symposium on Biomedical Imaging: From Nano to Macro (ISBI), 2012. **Online PDF**
- **Oksuz, I.**, Unay, D., Kadipasaoglu, K., “Segmentation of lung vessel tree in 3-D CTA data”, Proc. (MASFOR), Istanbul - Turkey, 2012. **Online PDF**

PROFESSIONAL EXPERIENCE

King’s College London
London, UK

January 2017-present
(Research Associate)

- Works on EPSRC Grant (EP/P001009/1) “SmartHeart: Next-generation cardiovascular healthcare via integrated image acquisition, reconstruction, analysis and learning” in collaboration with Prof. Danieal Rucekert from Imperial College, Prof. Alison Noble from Oxford University and Prof. Steffen Petersen from Queen’s Mary University London
- Focuses on cardiac MR image quality assessment.

The University of Edinburgh
Edinburgh, UK

January 2017-July 2017
(Visiting Researcher)

- Developed bayesian-based optimization methodologies for joint registration and segmentation.
- Focused on myocardial segmentation and registration for timeseries generation.

IMT Institute for Advanced Studies
Lucca, Italy

November 2013-December 2017
(Research Assistant)

- Worked on NIH Grant (2R01HL091989-05) “Reliable Evaluation of Coronary Artery Disease using Myocardial BOLD MRI with CO2 ” in collaboration with Prof. Rohan Dharmakumar from Cedars Sinai Medical Center.
- Focused on discriminative feature learning with sparse dictionaries for the myocardium for the challenges of registration and segmentation.

Yale University Medical School
New Haven, CT, USA

November 2015-September 2016
(Post-graduate Fellow)

- Involved in Multi-modality registration of prostate biopsy from MR and TRUS images in collaboration with Assoc. Prof. Xenios Papademetris and Dr. John Onofrey from Yale University Diagnostic Radiology Department.
- Focused on definition of a learning based similarity metric for the challenge of multi-modality registration.

Bahcesehir University
Research Assistant, Istanbul, Turkey

February 2011-October 2013
(Research Assistant)

- Carried out research on coronary artery and lung vessel segmentation on CT Angiography data.
- Worked on Turkish Industry Ministry Project “4-Dimensional Heart modeling and Hemodynamics Engineering”.

Koc University
Trainee, Istanbul, Turkey

June 2008-August 2008
(Trainee)

INVITED TALKS

- **National Magnetic Research Center, Bilkent University:** Data-driven methods for cardiac MR segmentation, registration and quality assessment, **November 2017**
- **Akdeniz University:** Dictionary Learning based Medical Image Segmentation and Registration, **November 2016**
- **Bosphorus University:**Data-Driven Feature Learning for Myocardial Segmentation and Registration of CP-BOLD MRI, **August 2015**
- **Zuse Institute Berlin (ZIB):** Dictionary Learning of CP-BOLD MRI for Myocardial Segmentation and Registration, **June 2015**

- **RWTH Aachen:** CP-BOLD MRI: Sparse dictionary learning techniques for segmentation and registration, **May 2015**

ACTIVITIES/MEMBERSHIPS

- MICCAI
- IEEE (EMBS)
- ISMRM
- SCMR
- MISS (Medical Imaging Summer School) 2014

HONORS and AWARDS

STACOM Best paper Award, STACOM (MICCAI)2017, Canada **September 2017**

MICCAI Student Travel Award Recipient, MICCAI 2015, Germany **October 2015**

ISMRM Educational Stipend Recipient, ISMRM 2015, Canada **May 2015**

Full Ph.D. Scholarship, **November 2013-present**
 IMT Institute for Advanced Studies Lucca, Italy

Scholarship Recipient, 4-D Modelling of Heart **January 2011-June 2013**
 Turkish Ministry of Science, Industry, and Technology Project

Honor Student, Master of Science **January 2011-September 2013**
 Electrical and Electronics Engineering, Bahcesehir University, Turkey

Full Scholarship, Master of Science **January 2011-September 2013**
 Electrical and Electronics Engineering, Bahcesehir University, Turkey

LANGUAGES

- English (Excellent) (Toefl IBT-103, IELTS 8.0)
- German (Excellent) (Abitur-Diploma)
- Italian (Intermediate) (B1 Certificate)

REFERENCES

- Julia Schnabel
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Biomedical Engineering Department King's College London
E-mail: andrew.king@kcl.ac.uk
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Director of PRIAN Group IMT Institute for Advanced Studies
E-mail: s.tsaftaris@ed.ac.uk
- Xenophon Papademetris
Diagnostic Radiology Department Department Yale University
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