Yongwan Lim

CONTACT INFORMATION

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RESEARCH INTERESTS

Magnetic Resonance Imaging (MRI)

- Real-time imaging, compressed sensing, image reconstruction, image deblurring, data and image analysis
- Application of MRI to the study of speech production

Signal and Image Processing

- Machine learning, deep learning, inverse problems, pattern recognition

EDUCATION

University of Southern California (USC), Los Angeles, CA, USA

Ph.D.,Electrical and Computer Engineering, *Expected:* Spring 2020

- Advisors: Krishna S. Nayak, Ph.D. and Shrikanth S. Narayanan, Ph.D.
- GPA: 3.79/4

Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea

M.S., Electrical Engineering, Feb 2014

- Thesis: *Free-breathing Abdominal MR Imaging for Reduction of Respiratory Motion Artifacts*
- Advisor: HyunWook Park, Ph.D.
- GPA: 4.26/4.3

Sogang University, Seoul, Korea

B.S., Electrical Engineering, Feb 2012

- GPA: 3.88/4.3 (Major: 4.19/4.3), *Summa Cum Laude*

RESEARCH EXPERIENCE

Graduate Research Assistant Aug 2015 – present

Magnetic Resonance Engineering Lab and Signal Analysis and Interpretation Lab, USC

Advisors: Krishna S. Nayak, Ph.D. and Shrikanth S. Narayanan, Ph.D.

- Operate MRI scanner and collect data (>50 subjects and 75 hours) for various linguistic studies
- Develop an image deblurring method for spiral real-time MRI
- Develop a three-dimensional real-time MRI technique for speech production study

Research Summer Intern July 2018

Samsung Fire & Marine Insurance, Seoul, Korea

- Developed a deep learning method for document classification

Research Intern June 2014 – June 2015

Image Media Research Center, Korea Institute of Science and Technology (KIST), Seoul, Korea

Advisor: Jaein Hwang, Ph.D.

- Developed an efficient tracking algorithm in 3D environment for augmented reality system with smartphones

Graduate Research Assistant Feb 2012 – Feb 2014

Image Computing System Lab, KAIST, Daejeon, Korea

Advisor: HyunWook Park, Ph.D.

- Developed an efficient data acquisition and image reconstruction method for reduction of respiratory motion artifact in abdominal MRI

Undergraduate Research Assistant June 2011 – Jan 2012

Image Processing Lab, Sogang University, Seoul, Korea

Advisor: Rae-Hong Park, Ph.D.

- Developed a 3D environment reconstruction method using the Kinect sensor

Journal Publications

4. **Y. Lim**, Y. Zhu, S. G. Lingala, D. Byrd, S. Narayanan, and K. S. Nayak, "3D dynamic MRI of the vocal tract during natural speech," *Magnetic Resonance in Medicine*, vol. 81, no. 3, pp. 1511–1520, Mar. 2019.
3. **Y. Lim**, S. G. Lingala, S. Narayanan, and K. S. Nayak, "Dynamic off-resonance correction for spiral real-time MRI of speech," *Magnetic Resonance in Medicine*, vol. 81, no. 1, pp. 234–246, Jan. 2019.
2. S. G. Lingala, Y. Zhu, **Y. Lim**, A. Toutios, Y. Ji, W-C. Lo, N. Seiberlich, S. Narayanan, K. S. Nayak, "Feasibility of spiral through-time GRAPPA for low latency accelerated real-time MRI of speech," *Magnetic Resonance in Medicine*, vol. 78, no. 6, pp. 2275–2282, Dec. 2017.
1. J. S. Choi, H. S. Seo, **Y. W. Lim**, Y. J. Han, and H. W. Park, "Sliding TOF: Sliding time of flight MR angiography using a dynamic image reconst -ruction method," *Magnetic Resonance in Medicine*, vol. 72, no. 3, pp. 1177–1183, Mar. 2015.

Conference Publications

12. **Y. Lim**, Y. Bliesener, S. Narayanan, and K. S. Nayak, "Calibrationless deblurring of spiral RT-MRI of speech production using convolutional neural networks," *in Proc. 27th Int. Society for Magnetic Resonance in Medicine (ISMRM) Scientific Sessions*, Montreal, Canada, May 2019. (Power pitch presentation)
11. S. G. Lingala, **Y. Lim**, S. Kruger, and K. S. Nayak, "Improved spiral dynamic MRI of vocal tract shaping at 3 Tesla using dynamic off resonance artifact correction," *in Proc. 27th Int. Society for Magnetic Resonance in Medicine (ISMRM) Scientific Sessions*, Montreal, Canada, May 2019. (Oral presentation)
10. S. Sudhakara, **Y. Lim**, W. Chen, S. Narayanan, and K. S. Nayak, "Low-latency reconstruction for real-time speech MRI," *in Proc. 27th Int. Society for Magnetic Resonance in Medicine (ISMRM) Scientific Sessions*, Montreal, Canada, May 2019. (E-poster presentation)

9. **Y. Lim**, Y. Zhu, S. G. Lingala, D. Byrd, S. Narayanan, and K. S. Nayak, "3D real-time MRI of vocal tract shaping," *in Proc. 26th Int. Society for Magnetic Resonance in Medicine (ISMRM) Scientific Sessions*, p. 3541, Paris, France, June 2018. (E-poster presentation)

8. W. Chen, **Y. Lim**, Y. Bliesener, S. Narayanan, and K. S. Nayak, "Comparison of leading reconstruction techniques for real-time speech MRI," *in Proc. 26th Int. Society for Magnetic Resonance in Medicine (ISMRM) Scientific Sessions*, p. 3516, Paris, France, June 2018. (E-poster presentation)

7. **Y. Lim**, S. G. Lingala, S. Narayanan, and K. S. Nayak, "Correction of dynamic off-resonance in spiral 2D real-time MRI of speech," *in Proc. 25th Int. Society for Magnetic Resonance in Medicine (ISMRM) Scientific Sessions*, p. 4017, Honolulu, HI, USA, Apr. 2017. (E-poster presentation)

6. J. Chen, S. G. Lingala, **Y. Lim**, A. Toutios, S. Narayanan, and K. S. Nayak, "Task-based optimization of regularization in highly accelerated speech RT-MRI," *in Proc. 25th Int. Society for Magnetic Resonance in Medicine (ISMRM) Scientific Sessions*, p. 1409, Honolulu, HI, USA, Apr. 2017. (Poster presentation)

5. **Y. Lim**, S. G. Lingala, A. Toutios, S. Narayanan, and K. S. Nayak, "Improved depiction of tissue boundaries in vocal tract real-time MRI using automatic off-resonance correction," *in Proc. Interspeech*, pp. 1765–1769, San Francisco, CA, USA, Sep. 2016. (Poster presentation)

4. S. G. Lingala, A. Toutios, J. Toger, **Y. Lim**, Y. Zhu, Y-C. Kim, C. Vaz, S. Narayanan, and K. S. Nayak, "State of the art MRI protocol for comprehensive assessment of vocal tract structure and function," *in Proc. Interspeech*, pp. 475–479, San Francisco, CA, USA, Sep. 2016. (Oral presentation)

3. J. Toger, **Y. Lim**, S. G. Lingala, S. Narayanan, K. S. Nayak, "Sensitivity of quantitative RT-MRI metrics of vocal tract dynamics to image reconstruction settings," *In Proc. Interspeech*, pp. 165–169, San Francisco, CA, USA, Sep. 2016. (Oral presentation)

2. **Y. W. Lim**, Y. J. Han, and H. W. Park, "A robust data acquisition method for reduced respiratory motion artifact in free-breathing image," *In Proc. Int. Society for Magnetic Resonance in Medicine (ISMRM)*, p. 4368, Milan, Italy, Apr. 2014. (E-poster presentation)

1. **Y. W. Lim**, H.-Z. Lee, N.-E. Yang, and R.-H. Park, "3-D reconstruction using the Kinect sensor and its application to a visualization system," *in Proc. 2012 IEEE Int. Conf. Systems, Man, and Cybernetics*, pp. 3343–3348, Seoul, Korea, Oct. 2012. (Oral presentation)

Patent

2. H. W. Park, **Y. W. Lim**, and Y. J. Han, "Magnetic resonance imaging apparatus and control method," Appl. No.: 14/804678, Filed Date: Jul. 21, 2015, U.S. Pub. No.: US 2016/0018497 A1, Pub. Date: Jan. 21, 2016.

1. H. W. Park, **Y. W. Lim**, and Y. J. Han, "Magnetic resonance imaging device and control method thereof," KOREA 10-2014-0091888, Aug. 2014.

Awards

Travel Awards

- ISMRM Educational Stipend Award 2017–2019
- GSG Travel Grant, Graduate Student Government, USC 2016–2018

Student Awards

- Korea Government Fellowship 2012–2013
- Best Paper Award, 25th Korea Signal Processing Conference Sep 2012
- Golden Medal Award of the Academic Competition, Sogang University Nov 2011
- IT-Master Fellowship, Korea Telecom Co. 2011
- Merit-based Scholarship (top 15 among 1.5k), Sogang University 2009–2011

Teaching Experience

Teaching Assistant

- HSS189 - EE Freshmen Seminar, KAIST Spring 2013

Math and Science Teacher Mar 2011 – Dec 2011
High school math and science
Youngnak Borinwon: The sisterhood relationship orphanage, Seoul, Korea

Other Experience

Reviewer

- IEEE ISBI 2020
- ISMRM Annual Conference 2019
- Precision and Future Medicine 2018

Military Service

- Sergeant (Administrative Specialist) Jan 2007 – Jan 2009
  The Army of Republic of Korea, Choongju, Korea

Software Skills

Computer Programming:

- Python, Pytorch, Tensorflow, MATLAB, C, C++, Java, UNIX shell scripting, LaTeX, and others

Languages

Korean and English