Byunghwan Jeon

1. Contact Information

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(3) Address: Room# 06-414-1, 1st Engineering Bld., 50 Gamasilgil (Kyungil Univ.), Hayangup, Gyeongsan city, Gyeongbuk, South Korea (zip 38428)

2. Education

(1) Ph. D. (Mar. 2014 - Aug. 2019)

- Medical Science, College of Medicine, Yonsei University
- Medical Image Computing & Analysis Lab. of Prof. Chang, Hyuk-Jae
- Co-advised by Prof. Chang, Hyuk-Jae, Prof. Shim, Hackjoon at Yonsei University, Seoul, Korea)
- Application of computer vision techniques, such as, Bayesian estimation, geometric analysis, deep neural network to localization, tracking and segmentation tasks in medical images
- Dissertation: Fully Automatic Extraction of Coronary Arteries based on Analysis of Geometric Relations by Bayesian Inference from 3D CT Images

(2) B. S. (Mar. 2009 - Aug. 2013)

- Dep. of Computer Science and Engineering, Hankuk University of Foreign Studies (HUFS)

3. Projects & Work Experiences

(1) Kyungil University (2020.03 - Present)

- Assistant Professor @ Department of Computer Science (AI-software major)

. (2020 - Now), reinforcement learning

(2) Severance Hospital, Yonsei University Health System (2012 – 2020.02)

- Researcher @ Medical Image Computing & Analysis Lab.

. (2018 - Now), Intelligent SW Technology Development for Medical Data Analysis, National IT Industry Promotion Agency (NIPA),

. (2013 - 2017), Development of Multi-modality Imaging and 3D Simulation-Based Integrative Diagnosis-Treatment Support Software System for Cardiovascular Diseases, the Korea government (MSIP),

. (2012 - 2018), Leading Foreign Research Institute Recruitment Program, National Research Foundation of Korea (NRF)

. (2017 - 2018), Junior Integrative Research, Institute of Convergence Science, Yonsei University

4. Publication of International Journals (*: the corresponding author)

[1] **Jeon Byunghwan**, Jang Y, Shim H*, Chang H., "Identification of Coronary Arteries in CT Images by Bayesian Analysis of Geometric Relations among Anatomical Landmarks," *Pattern Recognition*, (IF: 5.898), Dec. 2019.

[2] **Jeon Byunghwan**, Hong Y, Han D*, Jang Y, Jung S, Hong Y, ... & Chang, H. "Maximum a posteriori estimation method for aorta localization and coronary seed identification," *Pattern Recognition,* (IF: 5.898) Aug. 2017.

[3] Jia D, **Jeon Byunghwan (co-first author)**, Park H, Chang H, & Zhang LT*. Image-Based Flow Simulations of Pre-and Post-left Atrial Appendage Closure in the Left Atrium. *Cardiovascular Engineering and Technology*, (IF: 1.776) Apr. 2019.

[4] Chung H, **Jeon Byunghwan (co-first author)**, Chang H*, Han D, Shim H, Cho I, ... & Chung N. Predicting peri-device leakage of left atrial appendage device closure using novel three-dimensional geometric CT analysis. *Journal of Cardiovascular Ultrasound*, (IF: 0.82) Dec. 2015.

[5] Hong Y, Park H*, Lee B, Jang Y, Jung S, **Byunghwan Jeon**, Ha S, Shim H, Jang Y, Chang H, "Clinical feasibility of catheter-directed selective intra-coronary CTA using an extremely low dose of iodine in patients with CAD," *European Radiology*, (IF: 3.967) May. 2019.

[6] Han D, Shim H, **Jeon Byunghwan**, Jang Y, Hong Y, Jung S, ... & Chang H*. Automatic coronary artery segmentation using active search for branches and seemingly disconnected vessel segments from coronary CT angiography. *PloS one* (IF: 3.057) Aug. 2016.

[7] Y. Jang, I. Cho, B. W.O. Hartaigh, S. I. Park, Y. Hong, S. Shim, S. Ha, **Byunghwan Jeon**, H. Shim, J. K. Min, H. J. Chang, Y. Jang, N. Chung, "Viability assessment after conventional coronary angiography using a novel cardiovascular interventional therapeutic CT (CVIT-CT) system: comparison with gross morphology in a sub-acute infarct swine model," *Journal of Cardiovascular Computed Tomography* (IF: 2.29), Vol. 9, No. 4, May 2015.

[8] Y. Hong, S. Shin*, H. B. Park, B. K. Lee, R. Arsanjani, B. OHartaigh, S. Ha, Y. Jang, **Byunghwan Jeon**, S. Jung, S. I. Park, J. M. Sung, H. Shim, H. J. Chang, "Feasibility of selective catheter-directed CCTA using ultra-low-dose intracoronary contrast injection in a swine model," *Investigative Radiology* (IF: 4.44), Vol. 50, No. 7, Mar. 2015.

[9] Han D, Doan N, Shim H*, **Jeon Byunghwan**, Lee H, Hong Y, & Chang H. A fast seed detection using local geometrical feature for automatic tracking of coronary arteries in CTA. *Computer methods and programs in biomedicine* (IF: 1.90) Nov. 2014.

5. Publication of Domestic Journals (*: the corresponding author)

[1] Han K, **Jeon Byunghwan***, Kim S, Jang Y, Jung S, Shim H, & Chang H. Robust Coronary Artery Segmentation in 2D X-ray Images using Local Patch-based Re-connection Methods. *Journal of Broadcast Engineering*, Jul. 2019

[2] **Jeon Byunghwan**, Jang Y, Han D*, Shim H, & Chang H. Vessel Tracking Algorithm using Multiple Local Smooth Paths. *Journal of the Institute of Electronics and Information Engineers*, Jun. 2016

[3] Jang Y, Kim D, **Jeon Byunghwan**, Han D, Shim H, & Chang H. Generation of Triangular Mesh of Coronary Artery Using Mesh Merging. *Journal of KIISE*, Apr. 2016

6. International Conferences

[1] **Jeon Byunghwan**, Jang, Y., Jung, S., Shim, H., Chang, H. Deep Reinforcement Learning with Explicit Spatio-Sequential Encoding Network for 3D-Landmark Identification in CT Images, *CVPR (computer vision and pattern recognition) 2020,* under review.

[2] **Jeon Byunghwan**, Shim, H., Chang, H. Deep Recursive Bayesian Maximal Path for Fully Automatic Extraction of Coronary Arteries in CT Images. *NeurIPS 2019 Workshop on Med-NeurIPS*, Dec. 2019

[3] Kim, S., Jang, Y., **Jeon Byunghwan**, Hong, Y., Shim, H., & Chang, H. Fully automatic segmentation of coronary arteries based on deep neural network in intravascular ultrasound images. *MICCAI workshop*, Sep. 2018

[4] Jung, S., Lee, S., **Jeon Byunghwan**, Jang, Y., & Chang, H. J. (2018, September). Deep Learning Based Coronary Artery Motion Artifact Compensation Using Style-Transfer Synthesis in CT Images. *MICCAI workshop*, Sep. 2018

[5] Hong, Y., Hong, Y. M., Jang, Y., Kim, S., **Jeon Byunghwan**, Jung, S., ... & Chang, H. J. (2017, April). Coronary luminal and wall mask prediction using convolutional neural network. *In 2017 IEEE 14th International Symposium on Biomedical Imaging (ISBI 2017)* (pp. 1049-1052). IEEE.

[6] Jang, Y., **Jeon Byunghwan**, & Chung Y. "Core-Shell Detection in Images of Polymer Microbeads." *Computer Applications for Bio-technology, Multimedia, and Ubiquitous City* (9-15). Springer, Berlin, Heidelberg, 2012

7. Awards

1. Academic Award for Excellence, *Department of Medical Science, Yonsei University*, Sep. 2019
2. Outstanding paper award, *31th Workshop on IPIU 2019* (Image Processing and Image Understanding), paper titled as "Robust Coronary Artery Segmentation in 2D X-ray Images using Local Patch-based Re-connection Methods", Feb. 2019
3. Outstanding paper award, *31th Workshop on IPIU 2019* (Image Processing and Image Understanding), paper titled as "Generation of High-Resolution Chest X-rays using Multi-scale Conditional Generative Adversarial Network with Attention", Feb. 2019
4. Outstanding paper award, *The institute of electronics and information engineers*, paper titled as "A Bayesian Approach to Identification of Coronary Artery", Jun. 2018
5. The grand prize (1st among 16 teams), *Institute of convergence science, Yonsei University*, Junior Integrative Research, "Development of Simulation system for left atrial appendage procedure based on 3D volume images", Mar. 2018

6. Certificate of merit, *Yonsei University*, In honor of outstanding contributions made in advancing the Medicine while writing the following Doctoral paper, "Maximum a Posteriori Estimation Method for Aorta Localization and Coronary Seed Identification", Dec. 2017
7. Certificate of merit, *Hankuk University of Foreign Studies (HUFS)*, "Core-Shell Detection in Images of Polymer Microbeads, Nov. 2012

8. Korean Patent

1. Method and apparatus for determining end point of blood vessel extraction, 1015799020000, 2015.12.17
2. Method and apparatus for analyzing quantitatively of myocardial viability, 1015799000000, 2015.12.17
3. Method for determining tortuosity of blood vessel 1020150086815, 2018.10.18
4. Vessel segmentation in angiogram, 1020150088563, 2018.12.04
5. Method for merging blood vessel using 3-d tubular meshes, 1016744620000, 2016.11.03
6. Blood vessel phantom manufactured by using 3-d printing technology, 1020150013254, 2015.01.28
7. Apparatus for detecting vessel and tracing method of the same of, 1016459660000, 2016.08.01
8. Apparatus for tracing vessel and tracing method of the same of, 1016354090000, 2016.06.27
9. Method and apparatus for detecting vascular based on medical image, 1016302310000, 2016.06.08
10. Method of insertion device simulation for left atrial appendage occlusion, 1015306820000, 2015.06.16
11. Seed point detection method for coronary artery extraction from CCTA, 1020140083789, 2014.07.04
12. A method for tracking a coronary artery in 3-d coronary computed tomography angiography using a random tree walk algorithm, 1020160089451, 2016.07.14
13. A method for extracting an aorta using a geometric information of a z-axial image, 1020160088456, 2017.10.30
14. A method for automatically extracting a starting point of coronary arteries, and an apparatus thereof, 1020170023609, 2017.02.22
15. Image database-based real-time registration method of 2d x-ray image and 3d CT image, and an apparatus thereof 1020170025971, 2017.02.28
16. CT image database-based cardiac image segmentation method and an apparatus thereof, 1020170026147, 2017.02.28

9. Scholarship

Journal Reviewer on Information Fusion (Elsevier)

9. Scholarship

1. Brain Korea National Science Scholarship of Korea Research Foundation (2014-2019)

2. Korean American Life Science Foundation (2017)