

## Minhyeong Yu

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RESEARCH INTERESTS	Deep Learning, Computer Vision, Semantic Segmentation, Semi/Self Supervised Learning, Federated Learning, Long Range Dependency Learning, Alternatives for Neural Network	
EDUCATION	<b>Korea University</b> M.S. in Computer Science and Engineering ( <i>Advisor: Prof. Seung Jun Baek</i> )	Mar 2019 - Feb 2022
	<b>University of Seoul</b> B.S. in Statistics and Data Science	Mar 2012 - Feb 2019
EXPERIENCE	<b>Korea University</b> , Rep. of Korea <i>M.S. Candidate, System Intelligence Group (SING) Laboratory</i> <ul style="list-style-type: none"><li>- Research on Federated Semi-Supervised Segmentation</li><li>- Project lead: AI system for Rehabilitation Medicine (Government funded)</li><li>- Research on Medical Image Segmentation of Median Nerve on Ultrasound Imaging Modality</li></ul>	Mar 2019 - Feb 2022
PAPERS	<ul style="list-style-type: none"><li>• <b>Minhyeong Yu</b>, Sunwoo Kim, Seungjun Baek. “Federated Semi-Supervised Segmentation with Randomized Weight Perturbation”, (Under Review), 2022</li><li>• Beom Suk Kim*, <b>Minhyeong Yu*</b>, Sunwoo Kim, Joon Shik Yoon, Seungjun Baek, “Scale-Attentional U-Net for the Segmentation of the Median Nerve in Ultrasound Images”, (Under Review), 2021</li><li>• Minki Kim* <b>Minhyeong Yu*</b>, “Selection and Proposal of Vertical Building Forest Sites in preparation for the implementation of the Seoul Park Cancellation”, Review of Korean Society for Internet Information, v.19 no.2, pp.15-26, 2018</li></ul>	
SELECTED PROJECTS	<ul style="list-style-type: none"><li>• <b>Federated Semi-Supervised Segmentaton</b>, Korea University Medical image segmentation is challenging because of lack of annotated data and the reluctance of institutions sharing sensitive patient information. Recent advances in federated learning and semisupervised learning enable training models with limited labels in a privacy preserving manner. We propose FedWeP, a method for federated semisupervised segmentation. FedWeP uses Randomized Weight Perturbation in which the server modulates model weights with Gaussian noise, and disseminates perturbed models to clients for semi-supervised training.</li><li>• <b>AI system for Rehabilitation Medicine</b>, Korea University We have been developing AI based system for rehabilitation medicine since september 2020, supported by the MSIT (Ministry of Science and ICT), Korea, under the ICT Creative Consilience program supervised by the IITP (Institute for Information &amp; communications Technology Planning &amp; Evaluation). We developed the system that assesses hemiplegic patients and recommend proper exercises for the first year and the system that automatic detection of videofluoroscopic swallowing study for stroke patient for the second year.</li><li>• <b>Medical Image Segmentaton</b>, Korea University We collaborated with Korea Guro Hospital to develop deep learning based nerve segmentation on ultrasound imaging modality. We won the excellence prize at the Korean Academy of Neuromusculoskeletal Sonography and applied for a patent. We further studied the research and proposed a novel convolution called scale-attentional convolution which combines information at multiple scales with cascaded and factorized convolutions followed by self-attention over scale and channel features.</li></ul>	<div>Feb 2022 - Mar 2022</div> <div>Sep 2020 - Dec 2021</div> <div>May 2020 - Nov 2021</div>
PATENTS & AWARDS	<ul style="list-style-type: none"><li>• “Method and apparatus for automatically recognizing peripheral nerves and measuring nerve indicators in ultrasound images based on deep learning algorithms”, 10-2020-0067199, Rep. of Korea</li><li>• Excellence Prize, Korean Academy of Neuromusculoskeletal Sonography</li><li>• Excellence Prize, Seoul Digital Foundation</li></ul>	<div>Jun 2020</div> <div>Nov 2020</div> <div>Nov 2018</div>