


# Seung Hyun Lee

## CONTACT INFORMATION

Seung Hyun Lee  
Seoul, Korea

 **Homepage**  
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## RESEARCH INTERESTS

**Computer Vision:** Multimodal Generative Models  
**Generative Model:** GAN, Diffusion Models, Sequence Modeling  
Artificial General Intelligence, Image & Video Generation

## EDUCATION

**M.S.** in Artificial Intelligence, Korea University Mar 2022 - Feb 2024  
Collaborated with **Dr. {Feng Yang, Irfan Essa, Glenn Entis, Yinxiao Li, Jiahui Yu, Han Zhang, Huiwen Chang, Innfarn Yoo}**, **Junjie Ke @ Google Research**  
Collaborated with **Dr. Wonmin Byeon @ NVIDIA Research**  
Advisor: **Prof. Sangpil Kim**  
Thesis: Generative Models, Perception Algorithm  
Advisor: **Prof. Jinkyu Kim**  
Thesis: Representation Learning, Advisable AI  
**B.S.** in Computer Science, University of Seoul Mar 2016 - Feb 2022  
2 years of absence for obligatory military service  
Undergraduate Research Assistant  
• Medical AI, Yonsei University Severance Hospital CCIDS

## RESEARCH EXPERIENCE

**Google Research**, Mountain View, CA (Onsite) Jul 2023 - Mar 2024  
*Student Researcher @ AI4Design*  
Advisors: **Dr. Feng Yang, Dr. Yinxiao Li, Dr. Innfarn Yoo, Dr. Huiwen Chang**,  
Projects: Image Generation Quality Improvement (**Extension**, < 20%)  
**Naver Papago**, Pangyo, Korea Dec 2020 - Jun 2021  
*Research Intern @ Computer Vision Lab*  
Projects: Real-time tracking for optical character recognition  
**Yonsei University**, Seoul, Korea Mar 2019– Nov 2020  
*Research Intern @ Severance Hospital CCIDS*  
Projects: Pathologic Complete Response Prediction after Neoadjuvant Chemoradiation  
Therapy for Rectal Cancer Using Radiomics and Deep Embedding Network of MRI

## CONFERENCE PUBLICATIONS (\* Equal contribution)

**Seung hyun Lee**, Wonseok Roh, Wonmin Byeon, SangHo Yoon, Chanyoung Kim, Jinkyu Kim\*, Sangpil Kim\*, “**Sound-Guided Semantic Image Manipulation**”, In **CVPR**, 2022.  
**Seung hyun Lee**, Gyeongrok Oh, Wonmin Byeon, Chanyoung Kim, Won Jeong Ryoo, Sang Ho Yoon, Jihyun Bae, Jinkyu Kim\*, Sangpil Kim\*, “**Sound-Guided Semantic Video Generation**”, In **ECCV**, 2022.  
Yujin Jeong, Won Jeong Ryoo, **Seung hyun Lee**, Da Bin Seo, Wonmin Byeon, Sangpil Kim, Jinkyu Kim, **The Power of Sound (TPoS): Audio Reactive Video Generation with Stable Diffusion**, **ICCV**, 2023.  
Wonseok Roh, **Seung hyun Lee**, Won Jeong Ryoo, Gyeongrok Oh, Jakyung Lee, Soo Yeon Hwang, Hyung-gun Chi, Sangpil Kim, “**Functional Hand Type Prior for 3D Hand Pose Estimation and Action Recognition from Egocentric View Monocular Videos**”, **BMVC** Oral (< 5% acceptance rate), 2023.

## JOURNAL PUBLICATIONS (\* Equal contribution)

**Seung hyun Lee**, Joonseok Lim, Jaeseung Shin, Sungwon Kim, and Heasoo Hwang, “**Pathologic Complete Response Prediction after Neoadjuvant Chemoradiation Therapy for Rectal Cancer Using Radiomics and Deep Embedding Network of MRI**”, Applied Sciences (2021).  
Minjoon Jung, **Seung hyun Lee**, Eun Seon Sim, Min Ho Jo, Yu Jin Lee, Hye Bin Choi, Junseok Kwon, “**Stagemix video generation using face and body keypoints detection**”, Multimedia Tools and Applications (2022).

PREPRINTS	<p><b>Seung hyun Lee</b>, Yinxiao Li, Junjie Ke, Innfarn Yoo, Han Zhang, Jiahui Yu, Qifei Wang, Fei Deng, Glenn Entis, Junfeng He, Gang Li, Sangpil Kim, Irfan Essa, Feng Yang, “<a href="#">Parrot: Pareto-optimal Multi-Reward Reinforcement Learning Framework for Text-to-Image Generation</a>”, <i>Under review</i>.</p> <p><b>Seung hyun Lee</b>, Sieun Kim, Innfarn Yoo, Feng Yang, Donghyeon Cho, Youngseo Kim, Huiwen Chang, Jinkyu Kim*, Sangpil Kim*, “<a href="#">Soundini: Sound-Guided Diffusion for Natural Video Editing</a>”, <i>Under review</i>.</p> <p><b>Seung hyun Lee</b>, Chanyoung Kim, Wonmin Byeon, SangHo Yoon, Jinkyu Kim*, Sangpil Kim*, “<a href="#">LISA: Localized Image Stylization with Audio via Implicit Neural Representation</a>”, <i>Patern Recognition – Under review</i>.</p> <p><b>Seung hyun Lee</b>, Chanyoung Kim, Wonmin Byeon, Gyeongrok Oh, Jooyoung Lee, SangHo Yoon, Jinkyu Kim*, Sangpil Kim*, “<a href="#">Robust Sound-Guided Image Manipulation</a>”, <i>Neural Networks–Under review</i>.</p>	
WORKSHOP PUBLICATIONS	<p><b>Seung hyun Lee</b>, Sang Ho Yoon, *Jinkyu Kim, *Sangpil Kim. “<a href="#">Sound-Guided Semantic Image Manipulation</a>”. In <i>NIPS W</i>–CtrlGen Workshop, 2021.</p> <p><b>Seung hyun Lee</b>, Nahyuk Lee, Chanyoung Kim, Wonjeong Ryoo, Jinkyu Kim, Sangho Yoon, Sangpil Kim. “<a href="#">Audio-Guided Image Manipulation for Artistic Paintings</a>”. In <i>NIPS W</i>–Machine Learning for Creativity and Design Workshop , 2021.</p>	
SKILLS	<p><b>Programming Languages:</b> Python, C/C++, Java.</p> <p><b>Tools:</b> Deep Learning Frameworks (JAX, PyTorch, TensorFlow), Python Libraries (Diffuser, OpenCV, etc), Parallel Programming (CUDA).</p>	
AWARD AND HONORS	<p>Full scholarship from Korea University for Master’s Degree, Seoul Korea</p> <p>Best Paper Award, University of Seoul</p> <p>Software Maestro 11th - Best Software talent discovery program, Korea</p> <p>President of Algorithm Club at University of Seoul</p>	<p>2022 - 2024</p> <p>2021</p> <p>2020</p> <p>2016 - 2018</p>
TEACHING EXPERIENCE	<p><b>Korea University</b>, Seoul Korea</p> <ul style="list-style-type: none"> <li>Teaching Assistant of Machine Learning (Spring 2023)</li> </ul>	
ACADEMIC SERVICE	<p><b>Reviewer of</b>,</p> <ul style="list-style-type: none"> <li>Frontiers in Signal Processing, section Image Processing</li> </ul>	
OTHER SERVICES	<p>Pytorch Open Source Contribution, Pytorch Tutorial Translation (lead menti)</p> <p>Google Developer Student Clubs – University of Seoul, Korea</p> <p>SeoulMate – Buddy program for the international students, Korea</p>	<p>2021</p> <p>2021</p> <p>2016</p>
PATENTS	<p><b>Seunghyun Lee</b>. “Image Quality Improvement Appratus Using Artificial Neural Network”. <i>Korea</i> 1020200021991, filed 20.02 issued 21.09.</p>	
REFERENCES	<p><b>Korea University</b></p> <ul style="list-style-type: none"> <li><b>Prof. Sangpil Kim</b> (Advisor) <i>Assistant Professor</i></li> <li><b>Prof. Jinkyu Kim</b> (Thesis Advisory Committee) <i>Assistant Professor</i></li> </ul> <p><b>Google Research</b></p> <ul style="list-style-type: none"> <li><b>Dr. Feng Yang</b> (Internship Mentor) <i>Research Scientist</i></li> <li><b>Dr. Yinxiao Li</b> (Research Mentor) <i>Research Scientist</i></li> <li><b>Dr. Irfan Essa</b> (Research Mentor) <i>Research Scientist</i></li> <li><b>Dr. Innfarn Yoo</b> (Research Mentor) <i>Research Scientist</i></li> </ul> <p><b>Open AI</b></p> <ul style="list-style-type: none"> <li><b>Dr. Jiahui Yu</b> (Research Mentor) <i>Research Scientist</i></li> <li><b>Dr. Huiwen Chang</b> (Research Mentor) <i>Research Scientist</i></li> </ul> <p><b>NVIDIA Research</b></p> <ul style="list-style-type: none"> <li><b>Dr. Wonmin Byeon</b> (Research Mentor) <i>Research Scientist</i></li> </ul>	