Donggyu **Joo**

Senior Perception Engineer @ NVIDIA

jdg10126@gmail.com | donggyu-joo-a0a8ba22b | Donggyu Joo

Summary

Senior Perception Engineer at NVIDIA with a **Ph.D. in Electrical Engineering**, working on obstacle perception models for autonomous driving. Previously spent 4+ years at **Samsung Research** developing on-device computer vision and vision-language AI for Galaxy devices. Shipped **8 on-device AI features** globally, including VLM-based semantic photo search for Galaxy Gallery with models under 100M parameters. Expertise spans large-scale multimodal data curation (50M+ image-text pairs), model training and evaluation, and on-device optimization. **Technically led a team of 6 engineers** across data, modeling, evaluation, and deployment.

Skills

Core AI & Research	Computer Vision, Obstacle Perception, Vision-Language Models, Image-Text Retrieval, Model Compression
Production ML	On-device AI, Model Optimization, Quantization, Distillation, TFLite Deployment, Edge-case Debugging
Data & Evaluation	Large-scale Data Curation, Model Training & Evaluation, Robustness Evaluation, Data Quality Control
Languages & Tools	Python, PyTorch, TensorFlow, TFLite, Git

Experience

NVIDIA — *Seoul, S. Korea*

Senior Perception Engineer — *Nov. 2026 - Present*

- Developing obstacle perception models for autonomous driving.

Samsung Research — *Seoul, S. Korea*

Senior Machine Learning Scientist — *Sep. 2022 - Oct. 2026*

- **Gallery Photo Search:** Developed and deployed on-device multi-label image recognition model for semantic photo search (under 100M parameters). Expanded query coverage from 500 to 2,000+ categories while improving F1 score by 2%.
- **Multimodal Data Curation:** Built GenAI-assisted labeling and filtering pipelines for 50M+ image-text pairs. Improved robustness by reducing noisy labels and increasing coverage of long-tail real-world image categories.
- **Research-to-Product:** Shipped 8 on-device AI models to production for Galaxy devices. Owned model optimization, TFLite conversion, on-device validation, latency tuning, and edge-case debugging based on user feedback.
- **Technical Leadership:** Led 6 engineers across data curation, modeling, evaluation, and release. Collaborated with product and engineering stakeholders to turn ambiguous user-facing problems into deployable AI features.

Education

KAIST — *Daejeon, S. Korea*

Ph.D. in Electrical Engineering — *Feb. 2018 - Aug. 2022*

- Thesis: Effective Deep Neural Network Compression Based on the Network Pruning
- Advisor: Prof. Junmo Kim

KAIST — *Daejeon, S. Korea*

M.S. in Electrical Engineering — *Sep. 2016 - Feb. 2018*

- Thesis: Unconstrained Control of Feature Map Size Using Non-integer Strided Sampling
- Advisor: Prof. Junmo Kim

KAIST — *Daejeon, S. Korea*

B.S. in Electrical Engineering (Summa Cum Laude) — *Mar. 2013 - Aug. 2016*

Publications [Citations: 2,900+ | h-index: 8]

Selected Publications

- **Donggyu Joo**, Eojindl Yi, Sunghyun Baek, and Junmo Kim, "Linearly Replaceable Filters for Deep Network Channel Pruning", The Thirty-Fifth AAAI Conference on Artificial Intelligence (**AAAI**), 2021

- Janghyeon Lee, Hyeong Gwon Hong, **Donggyu Joo**, and Junmo Kim, "Continual Learning with Extended Kronecker-factored Approximate Curvature", IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2020

- Janghyeon Lee, **Donggyu Joo**, Hyeong Gwon Hong, and Junmo Kim, "Residual Continual Learning", Thirty-Fourth AAAI Conference on Artificial Intelligence (**AAAI**), Oral presentation, 2020

- **Donggyu Joo***, Doyeon Kim*, and Junmo Kim, "Generating a Fusion Image: One's Identity and Another's Shape", IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2018

- Junho Yim, **Donggyu Joo**, Jihoon Bae, and Junmo Kim, "A Gift From Knowledge Distillation: Fast Optimization, Network Minimization and Transfer Learning", IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2017

Other Publications

- Doyeon Kim, Dongyeun Lee, **Donggyu Joo**, and Junmo Kim, "Training Cartoonization Network without Cartoon", 2023 IEEE International Conference on Image Processing (**ICIP**), 2023

- **Donggyu Joo**, Sunghyun Baek, and Junmo Kim, "Which Metrics for Network Pruning: Final Accuracy? Or Accuracy Drop?", The 29th IEEE International Conference on Image Processing (**ICIP**), 2022

- Doyeon Kim, Woonghyun Ka, Pyungwhan Ahn, **Donggyu Joo**, Sehwan Chun, and Junmo Kim, "Global-Local Path Networks for Monocular Depth Estimation with Vertical CutDepth", arXiv preprint arXiv:2201.07436, 2022

- **Donggyu Joo**, Doyeon Kim, Eojindl Yi, and Junmo Kim, "Linear Combination Approximation of Feature for Channel Pruning", Efficient Deep Learning for Computer Vision CVPR Workshop (**CVPRW**), 2022

- **Donggyu Joo**, Doyeon Kim, and Junmo Kim, "Slimming ResNet by Slimming Shortcut", 25th International Conference on Pattern Recognition (**ICPR**), 2020.

- Doyeon Kim, **Donggyu Joo**, and Junmo Kim, "Delivering Meaningful Representation for Monocular Depth Estimation", 25th International Conference on Pattern Recognition (**ICPR**), 2020.

- Doyeon Kim*, **Donggyu Joo***, and Junmo Kim, "TiVGAN: Text to Image to Video Generation with Step-by-Step Evolutionary Generator", **IEEE Access**, 2020.

- **Donggyu Joo**, Junho Yim, and Junmo Kim, "Unconstrained Control of Feature Map Size Using Non-integer Strided Sampling", 29th British Machine Vision Conference (**BMVC**), 2018

* These authors contributed equally.

Honors & Awards

2020 **Scholarship**, Young-Han Kim Global Leader Scholarship ($5,000)
2019 **Winner**, AI Reporter, AI WorldCup ($5,000)
2018 **Winner**, AI Reporter, AI WorldCup ($5,000)
2018 **Silver Prize**, 24th Samsung Humantech Paper Awards, Signal Processing ($7,000)
2017 **Silver Prize**, 23rd Samsung Humantech Paper Awards, Computer Science ($7,000)
2016 **Summa Cum Laude**, School of Electrical Engineering, KAIST
2015 **Dean's List**, School of Electrical Engineering, KAIST

Patents

United States

Neural Network Learning Method and Device for Recognizing Class

Junmo Kim, Byungju Kim, Juchang Kim, Yeakang Lee, Minsuk Park, Juseung Yun, Jaeyoung Lee, **Donggyu Joo**

U.S. Patent No. 11,449,733 B2 (Granted)

Electronic Device for Processing Image and Operating Method Thereof

Donggyu Joo, Dongchan Kim, Jinyoung Hwang

U.S. Patent Application Publication No. 2025/0292376 A1

Republic of Korea

Knowledge Transfer Method Using Deep Neural Network and Apparatus Therefor

Junmo Kim, Junho Yim, **Donggyu Joo**

Republic of Korea Patent No. 10-2061935 (Granted)

Knowledge Sharing Based Knowledge Transfer Method for Improving Quality of Knowledge and Apparatus Therefor

Junmo Kim, Junho Yim, **Donggyu Joo**, Jihoon Bae, Naesoo Kim, Chulsik Pyo

Republic of Korea Patent No. 10-2063376 (Granted)

Incremental Training Based Knowledge Transfer Method for Training Large Deep Neural Networks and Apparatus Therefor

Junmo Kim, Junho Yim, **Donggyu Joo**, Jihoon Bae, Naesoo Kim, Chulsik Pyo

Republic of Korea Patent No. 10-2063377 (Granted)

Electronic Device and Operating Method for the Same

Sangwon Lee, Sahngmin Yoo, **Donggyu Joo**, Jiman Kim, Jinyoung Hwang

Republic of Korea Patent Application No. 10-2024-0114486

Electronic Device Processing Image and Method of Operating the Same

Donggyu Joo, Dongchan Kim, Jinyoung Hwang

Republic of Korea Patent Application No. 10-2024-0088511

Electronic Apparatus for Identifying Abnormal Touch and Control Method Thereof

Donggyu Joo, Jinyoung Hwang

Republic of Korea Patent Application No. 10-2024-0009651