

Hyeongchan Kim

<https://github.com/kozistr>, <http://kozistr.tech/about>

EDUCATION

Korea University of Technology and Education

Mar 2016 –

CHALLENGES & AWARDS

Kaggle Challenges :: Competition Expert

- top 1% **Google Brain – Ventilator Pressure Prediction** (20 / 2659), 2021.
- top 4% **SIIM-FISABIO-RSNA-COVID-19 Detection** (47 / 1305), 2021.
- top 7% **Shopee – Price Match Guarantee** (166 / 2426), 2021.
- top 2% **Cornell Birdcall Identification** (24 / 1395), 2020.
- top 9% **ALAKSA2 Image Steganalysis** (93 / 1095), 2020.
- top 4% **Tweet Sentiment Extraction** (84 / 2227), 2020.
- top 4% **Flower Classification with TPUs** (27 / 848), 2020.
- top 4% **Bengali.AI Handwritten Grapheme Classification** (67 / 2059), 2020.
- top 3%, **Kannada MNIST Challenge** (28 / 1214), 2019.

Domestic Challenges

- 6th place, **NAVER NLP Challenge**, SRL Task, 2018.
- 4th / 13th place, **NAVER A.I Hackathon**, 2018.
- Final Round (Digital Forensic), **A.I R&D Challenge**, 2018.
- 9th place (3rd price, A book as an award), **TF-KR MNIST Challenge**, 2017.

PUBLICATIONS

- [1] Kim et al, [CNN ARCHITECTURE PREDICTING MOVIE RATING FROM AUDIENCE'S REVIEWS WRITTEN IN KOREAN](#). Jan. 2020.

INDUSTRY EXPERIENCE

Watcha, Seoul, South Korea

Jun 2020 – Present

Machine Learning Researcher

- Developed a new sequential recommendation architecture. (named *Trans4Rec*)
 - Newly proposed transformer architecture to improve the performance in a general manner.
 - Apply proper post-processing logic into the model.
- Developed a music recommendation system (prototype)

- Developed a training recipe to train sequential recommendation architecture robustly. (In service), (named *FutureFLAT*)
 - Build a new module to understand better at the time of inference.
 - Apply augmentations to the various features, leads to performance gain and robustness.
 - In A/B (online) test, *FLAT* vs *FutureFLAT* (statistically significant p-value < 0.05)
 - **Compared to the previous model, there's been no (statistically significant) change.**
 - However, it still seems to be better on the **offline metrics & training stability**. So, we chose to use it.
 - In A/B (online) test, [*Div2Vec*](#) vs *FutureFLAT* (statistically significant p-value < 0.05)
 - ***Viewing Days (mean):** improved **1.012%+**
 - ***Viewing Minutes (median):** improved **1.015%+**
- Developed the model to predict users' view-time of the contents.
 - Predict how many people going to watch, how much time people going to watch the content before the content is supplied.
 - Find out which features impact users' watch.
- Developed the pipeline to recognize main actors from the poster & still-cut images.
 - Utilize SOTA face detector & recognizer.
 - Optimize pre/post-processing routines for low latency.
- Developed a novel sequential recommendation architecture to recommend what content to watch next. (In service), (named *FLAT*)
 - Achieve SOTA performance compared to previous SOTA architectures (e.g. *BERT4Rec*).
 - In A/B (online) test, *previous algorithm* vs *FLAT* (statistically significant p-value < 0.05)
 - Paid Conversion:** improved **1.39%p+**
 - ***Viewing Days (mean):** improved **0.25%p+**
 - ***Viewing Minutes (median):** improved **4.10%p+**
 - Click Ratio:** improved **4.30%p+**
 - Play Ratio:** improved **2.32%p+**
- Developed Image Super-Resolution model to upscale movie & tv posters, still-cuts.
 - Optimize the codes for fast inference time & memory-efficiency on CPU.
 - In internal evaluation (qualitative evaluation by the designers), it catches details better & handles higher resolution & takes a little time.
- Working as a full-time.

% ***Viewing Days**: how many days users active on an app each month.

% ***Viewing Minutes**: how many minutes user watched the contents.

Rainist, Seoul, South Korea

Nov 2019 – Jun 2020

Machine Learning Engineer

- Developed the category classification model of card transactions, designed lightweight purpose for low latency. (In service)
 - In A/B (online) test (statistically significant p-value < 0.05)
***Accuracy**: improved about **25 ~ 30%p**
- Developed the RESTful API server to serve (general purpose) machine learning models.
 - Deployed & managed with K8s, utilized open source project.
 - Utilized inference-aware framework to reduce the latency.
 - **zero failure rate** (zero 40x, 50x error)
- Developed the classification model, forecasting the possibility of loan overdue.
- Worked as a full-time.

% ***Accuracy**: how many people don't update/change their transactions' category.

VoyagerX, Seoul, South Korea

Jan 2019 – Sep 2019

Machine Learning Engineer

- Developed speaker verification & diarization models to recognize the arbitrary speakers recorded from the noisy environments.
- Developed a semantic image segmentation model to identify a region of hair.
- Developed an image in-paint model to remove hair naturally from the face.
- Worked as an intern.

ELCID, Pangyo, Korea

Jun 2016 - Aug 2016

Penetration Tester

- Penetrated some products related to network firewall and anti-virus.
- Worked as a part-time job.

OUTSOURCING

Korea University Course Information Web Parsing, ITL July 2017 – Mar 2018

AWS CloudTrail logger analyzer / formator, ELCID Sep 2019 – Oct 2019

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| RESEARCH EXPERIENCE | Heterogeneous Parallel Computing Lab , Cheonan, Korea Sep 2018 - Dec 2018 Undergraduate Research <ul style="list-style-type: none"> Wrote a paper about the CNN architecture, which utilizes a channel-attention method to TextCNN model, brings performance gain over the task while keeping its latency, generally. Handling un-normalized text with various convolution kernel size and spatial dropout. |
| TALKS | NAVER NLP Workshop 2018 , Pangyo, Korea Dec 2018 <ul style="list-style-type: none"> SRL Task, challenging without any domain knowledge. Presented about trials & errors during the competition. |
| PROJECTS | |
| Generative | Awesome Generative Adversarial Networks (Stars 650+) July 2017 – Implement lots of Generative Adversarial Networks in TF 1.x. & 2.x. Novelty of this project is implementing lots of GANs in TF 1.x & 2.x based on the papers with some tweaks. |
| | gan-metrics (Stars 5) Mar 2020 – Implement lots of metrics for evaluating GAN in pytorch. |
| I2I Translation | Improved Content Disentanglement (Stars 3+) Sep 2019 Re-implement / tune 'Content Disentanglement' paper in pytorch. |
| Image Inpainting | Improved Edge-Connect (Stars 9) Oct 2019 Re-implement / tune 'Edge-Connect' paper in pytorch. |
| Style Transfer | Neural Image Style Transfer Mar 2018 Implement a neural image style transfer. |
| Segmentation | Awesome Segmentation (Stars 65+) Aug 2018 Implement lots of image semantic segmentation and ordered the papers. |
| Optimizer | pytorch-optimizer (Stars 10+) Sep 2021- Bunch of optimizer implementations in PyTorch with clean-code, strict types. Also, including useful optimization ideas. Most of the implementations are based on the original paper, but I added some tweaks. |

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| | AdaBound Optimizer (Stars 40+) | Jan 2019 |
| | Implement AdaBound Optimizer (Luo et al. 2019) w/ some tweaks in tensorflow. | |
| | RAdam Optimizer (Stars 4+) | Sep 2019 |
| | Implement RAdam Optimizer (Liu et al. 2019) w/ some tweaks in tensorflow. | |
| Super Resolution | Deep Residual Channel Attention Network (Stars 40+) | Sep 2018 |
| | Implement a RCAN model in tensorflow. | |
| | Enhanced Super Resolution GAN (Stars 30+) | Jun 2019 |
| | Implement an ESRGAN model in tensorflow. | |
| | Natural and Realistic SISR w/ Explicit NMD (Stars 5+) | Apr 2020 |
| | Implement a NatSR model in pytorch. | |
| NLP | Improved TextCNN (Stars 4+) | Dec 2018 |
| | Implement an improved TextCNN model (Kim et al. 2020) | |
| | Text Tagging | Dec 2018 |
| | Implement a text category classifier in tensorflow. | |
| R.L | Rosetta Stone (Stars 510+) | Sep 2018- |
| | Hearthstone simulator using C++ w/ some R.L. | |
| | I contributed to the project by implementing `feature extractor` and `neural network` in libtorch++. | |
| Speech Synthesis | Tacotron | Jan 2019 |
| | Implement a google tacotron speech synthesis in tensorflow. | |
| Open Source Contributions | syzkaller | Apr 2018 |
| | New Generation of Linux Kernel Fuzzer :: Minor contribution #575 | |
| | simpletransformers | Apr 2020 |
| | Transformers made simple with training, evaluating, and prediction possible with one line each :: Minor contribution #290 | |

