

# Heungsub Lee

## Contact

[heungsub.lee@subl.ee](mailto:heungsub.lee@subl.ee) or +82 10-3215-2380  
Web Sites  
[subl.ee](http://subl.ee), [github.com/sublee](https://github.com/sublee), [linkedin.com/in/sublee](https://linkedin.com/in/sublee)

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## Interests

- Parallel and distributed deep learning
- Developing and documenting API for engineers
- Free and open source software

## Skills

### Programming Languages

Python (expert), Go, JavaScript, Bash, C#

### AI Research

PyTorch, NVIDIA Nsight Systems, Data/model/pipeline Parallelism

### Back-end Development

Linux, AWS, Terraform, Docker, ZeroMQ, Redis, etcd, MySQL

### Test Engineering

Testify, mypy, pytest, GitLab CI, Travis CI

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## Work Experience

### Software Engineer

**Kakao Brain**, 2018–

A deep learning artificial intelligence laboratory in Kakao.

Focused on parallel and distributed deep learning to boost training performance.

Reproduced **GPipe** in PyTorch, and developed **torchgpipe** as an open source library.

### Game Server Architect

What! Studio in **Nexon**, 2013–2018

Developing **Durango**, a seamless open world MMORPG.

Designed and implemented the architecture of a distributed MMORPG server. The server achieved up to 70k concurrent users per MMO world.

Built an internationalization and localization system focused on linguistics features of Korean and Indo-European languages.

Led the server development team including up to 15 engineers.

### Game Development Engineer

Team Lupin in **Nexon**, 2011–2013

Developed and launched multiplayer racing games: **KartRider Dash** & **Coin Rush**

Designed and implemented a distributed game server architecture for synchronous multiplayer racing games.

Researched rating systems such as Elo, Glicko, and **TrueSkill** to develop a matchmaker for 4v4 or free-for-all games.

### Web Developer

**Npine**, 2008–2011

Supplies stock images for business on **Iclickart**.

Developed web services from the base framework to the application.

Maintained physical Linux machines in a data center.

Led the development team including three web developers.

### Front-end Web Developer

**Lunant**, 2008–2011

Served **VLAAH**, social media for discovering, sharing, and utilizing opinions.

Designed and implemented the UI/UX for **VLAAH**.

Developed an open source project **jDoctest**, which is a JavaScript testing framework using example code in documentation comments.

## Open Source Experience

**torchgpipe**, 2019–

A GPipe implementation in PyTorch.

Developed **GPipe** in PyTorch. GPipe is a scalable pipeline parallelism library for training of a giant model. The story behind this project can be found in **Kakao Brain Blog**<sup>ko</sup>.

Optimized the pipeline parallelism and checkpointing for CUDA and PyTorch's autograd engine.

**Hangulize**, 2010–

Automatically transcribes a non-Korean word into Hangul.

Implemented an automatic Hangul transcription algorithm to realize **Brian Jongseong Park's idea**. By origin, it was written in Python, but rewritten in Go for better features, performance, and productivity.

Designed and implemented the web service and RESTful API. Many professional Korean translators usually visit here to translate undocumented proper nouns. For example, Ryu Gwang, who is a famous technical translator, introduced this web service in **his posting**<sup>ko</sup>. Netflix also refers to it in **the Korean timed text style guide**.

**TrueSkill**, 2012–

A TrueSkill™ implementation in Python.

Implemented **TrueSkill™**, which is a rating algorithm for Xbox Live, in Python with a handy interface to learn and popularize the algorithm.

**Profiling**, 2014–2018

An interactive profiler for Python inspired by the Unity3D profiler.

Developed a tracing based and statistical profiler for Python with a handy interactive TUI inspired by **the Unity profiler**.

On GitHub, this project has been starred by 2.9k people. Also, it was the 3rd daily trending repository on Sep 22, 2014.

## Others

- **Tossi** – A utility for Korean allomorphic particles.
- **SUBLEERUNKER** – A simple parody game of SUBERUNKER. Play it in your web browser.
- **Flask-AutoIndex** – mod\_autoindex for Flask
- **Me2virus** – An XSS attack on **Me2day**, social media. When a user looks at an infected post, a new infected post was written on the user's wall.

## Contributions

For **PyTorch**, deprecated inconsistent API (**#21006**), discussed a counterintuitive behavior of the autograd engine (**#18568**); for **ZeroMQ**, discussed a PUB socket crash (**#2942**); for **Flask**, fixed a bug to generate URL with a subdomain (**#108**); for **jQuery 1.4.3**, restored a missing part of the content negotiation header for Ajax.

## Public Speeches

- **Remake of Hangulize**<sup>ko</sup> at Golang Korea Meetup Aug 2018
  - **Server architecture of Durango Vol. 3**<sup>ko</sup> at NDC 2018
  - **Python Survival Guide**<sup>ko</sup> at Nexon Talk 2016
  - **Server architecture of Durango Vol. 2**<sup>ko</sup> at NDC 2016, awarded the grand prize
  - **Profiling**<sup>ko</sup> at PyCon KR 2015
  - **Server architecture of Durango**<sup>ko</sup> at NDC 2014
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## Languages

- Korean – native
- English – conversational

## Education

Computer Software, **Kwangwoon University**, 2008 – Completed the first year only.