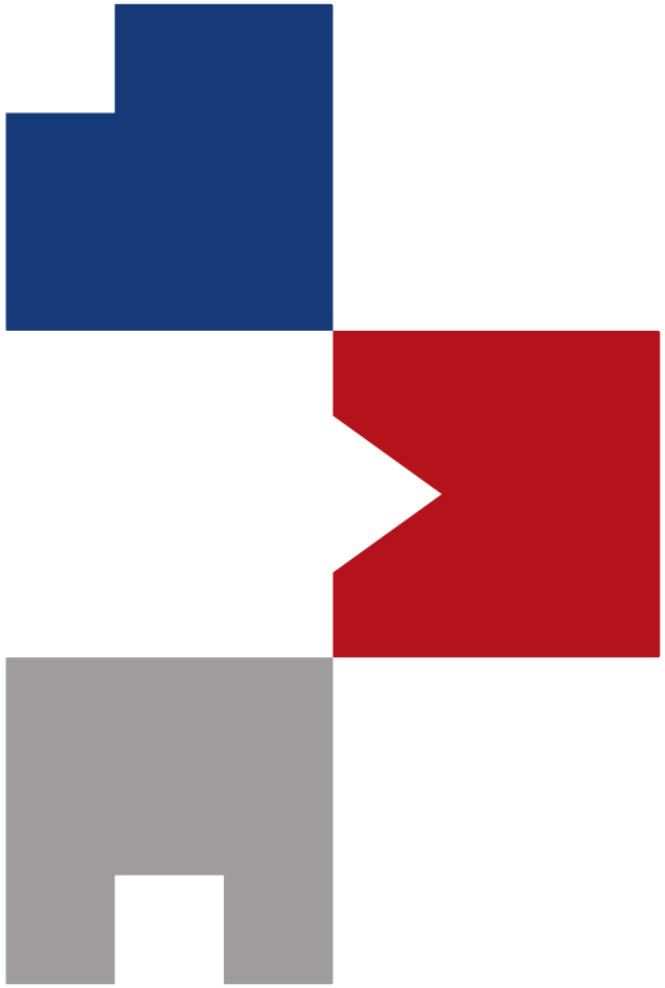


Course Overview

Sunglok Choi, Assistant Professor, Ph.D.
Computer Science and Engineering Department, SeoulTech
sunglok@seoultech.ac.kr | https://mint-lab.github.io/

Lecture Information

- When
  - 109075/21001: Thursday 09:00 – 12:50 in Korean
  - 109075/21002: Thursday 14:00 – 17:50 in English
- Where
  - Offline: **Mirae Hall**
    - 109075/21001 (Korean): **109 (for lectures) → 310/313 (for practice)**
    - 109075/21002 (English): **313 (for lectures and practice)**
  - Online: SeoulTech e-Class and Zoom (if necessary)
- Lecturer: **Sunglok Choi**
  - E-mail: sunglok@seoultech.ac.kr
    - Online meeting is available if you ask **through e-mail or e-Class message** in advance.
  - Office: 327 Mirae Hall
- Textbook: **Course slides**
- Online references: https://github.com/mint-lab/know-where/
  - Please refer *Programming (Python)* and *Machine Learning and Deep Learning* categories

Course Objective

- This course aims to improve **mathematical reasoning** and **programming skill** essential for students in computer science and engineering.
- To fulfill this objective, this course has five small missions as follows:
  - To understand open-source software (shortly OSS), OSS licenses, and version control systems
  - To learn **Python** programming language and build its experience by its applications
  - To understand essential **mathematical concepts** using Python and its OSS
  - To understand and apply **machine learning** and **deep learning** using Python and its OSS
  - **To start your own OSS project**

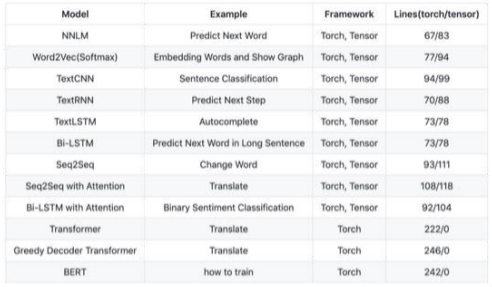
"Let's start to build your career portfolio!"

Course Objective

- **Career portfolio** [Wikipedia] [NamuWiki]
  - A collection of your works and projects (to apply for jobs or graduate universities)
  - e.g. Tae Hwan Jung (a.k.a. graykode): Homepage, Github

Projects

All | AI Product | NLP | Deep Learning

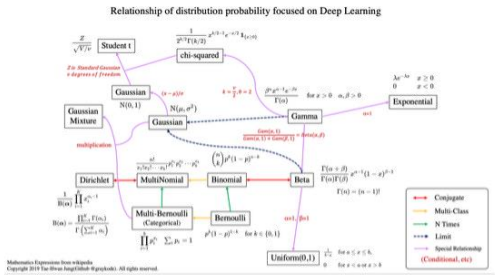


Model	Example	Framework	Lines(torch/tensor)
NNLM	Predict Next Word	Torch, Tensor	67/83
Word2Vec(Softmax)	Embedding Words and Show Graph	Torch, Tensor	77/94
TextCNN	Sentence Classification	Torch, Tensor	94/99
TextRNN	Predict Next Step	Torch, Tensor	70/88
TextLSTM	Autocomplete	Torch, Tensor	73/78
Bi-LSTM	Predict Next Word in Long Sentence	Torch, Tensor	73/78
Seq2Seq	Change Word	Torch, Tensor	93/111
Seq2Seq with Attention	Translate	Torch, Tensor	108/118
Bi-LSTM with Attention	Binary Sentiment Classification	Torch, Tensor	92/104
Transformer	Translate	Torch	222/0
Greedy Decoder Transformer	Translate	Torch	246/0
BERT	how to train	Torch	242/0

nlp-tutorial

Natural Language Processing Tutorial for Deep Learning Researchers stars 8.9k

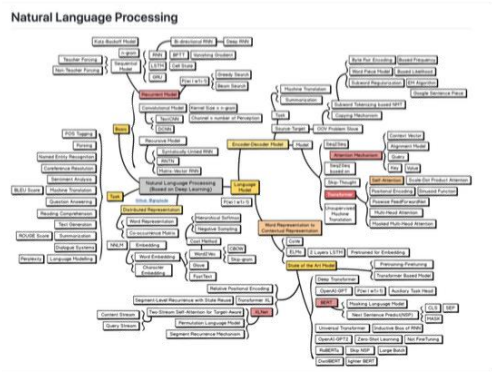
Github Reddit



distribution-is-all-you-need

The basic distribution probability Tutorial for Deep Learning Researchers stars 1.1k

Github



nlp-roadmap

ROADMAP(Mind Map) and KEYWORD for students those who have interest in learning NLP stars 2.5k

Github Reddit

```
test.py > calculate
def calculate(a, b, c):
    d = 100 * c - 10 * b + c
    return d

def create_app():
    @app.route("/")
    def index():
        return jsonify(hello="world")

def sina_xml_to_url_list(xml_data):
    rawurl = []
    dom = parseString(xml_data)
    for node in dom.getElementsByTagName('durl'):
        url = node.getElementsByTagName('url')[0]
        rawurl.append(url.childNodes[0].data)
    return rawurl
```

ai-docstring

A tool that AI automatically recommends commit messages.

stars 261

Github reddit

Image: Tae Hwan Jung's homepage (retrieved on June 24th, 2021)

Motivation

- How to estimate your skill set and proficiency (for entering a company or graduate school)
  - It's **your Github repository** these days.

Image: Akira Toriyama, "Dragon Ball Z", vol. 20, Shueisha (Seoul Media in Korean translation)

Motivation

- Make your (intermediate) works blossom!
  - e.g. Your homework assignments, your term projects, …

내가 그의 이름을 불러 주기 전에는
그는 다만
하나의 몸짓에 지나지 않았다.

내가 그의 이름을 불러 주었을 때
그는 나에게로 와서
꽃이 되었다.

– 김춘수의 '꽃' 中

(Tentative) Weekly Schedule

Week	Lectures (2-3 hr)	Practice (1-2 hr)
01	Introduction	Practice with Git, Github, and Markdown
02	Python: Basic	Practice with Python
03	Python: From Beginner to Intermediate	Practice with Python
04	Python: Standard Library	Practice with Python Standard Library
05	Python Meets Math: Calculus	Practice with SymPy and Matplotlib
06	Python Meets Math: Linear Algebra	Practice with NumPy
07	Python Meets Math: Optimization	Practice with SciPy
08	Python Meets Math: Probability and Statistics	Practice with SciPy
09	Machine Learning: Classification	Practice with scikit-learn
10	Machine Learning: Regression and Clustering	Practice with scikit-learn
11	*Midterm Examination*	
12	Deep Learning: Deep Neural Networks	Practice with PyTorch
13	Deep Learning: Convolutional Neural Networks	Practice with PyTorch
14	Deep Learning: Recurrent Neural Networks	Practice with PyTorch
15	*Term Project Presentation*	

Grading Policy

- **Examination (20%)**
  - **Mid-term exam** will be at the 11th week. (Note: no final exam)
- **Lab/homework assignments (40%)**
  - Lab and homework assignments will be given **almost every week** (roughly 12 times).
  - Their difficulty is **very easy** if you follow my lectures and **practices**.
  - Their deadline is generally **within roughly 1 week**.
- **Term project (30%)**
  - **Your OSS project with your desired topic** (open probably at Github)
  - You can perform the project **individually** or **as a team**.
    - (In case of teams) Their difficulty score will be considered with the number of members.
  - Your OSS project should include **`README.md`** for your explanation and demonstration of your works.
  - **Online exhibition** will be held after this semester.
- **Attendance (10%)**
  - Please let me know your absence due to public affairs **though e-mail** to be recognized as attendance.

Grading Policy

- **Attendance related to COVID-19**
  - I will recognize your attendance if you have COVID-19 or its symptom.
    - Please submit **your diagnosis paper (or receipt) through e-mail** before/after the classes.
    - Your diagnosis result (positive or negative on COVID-19) does not matter.
  - To follow up the class,
    - I will provide (last-year) videos recording on my lectures at e-Class.
    - I will always post important announcements at e-Class.

Grading Policy

- **Grading**: As good as possible until the school's guideline
  - Percentile
    - Korean course: A+ 10%, A0 30%, B+ 50%, B0 70%
    - English course: A+ 20%, A0 40%, B+ 60%, B0 80%
  - Average
    - Korean course: Max 3.30
    - English course: Max 3.60
  - Your final score and rank will be opened at the end of semester.
  - Please check your score and claim it **within the given deadline**.