How I apply to Top 20 University in the US

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Before our Talk

Where will I study this Fall?

◎ Ph.D. in Computer Science and Engineering at University of Notre Dame with scholarship

University of Notre Dame's Ranking

University of Notre Dame

Notre Dame, IN

🟨 **#49** in **Computer Science** (tie)

♡ Save

Source: US News

University of Notre Dame: Lovely campus
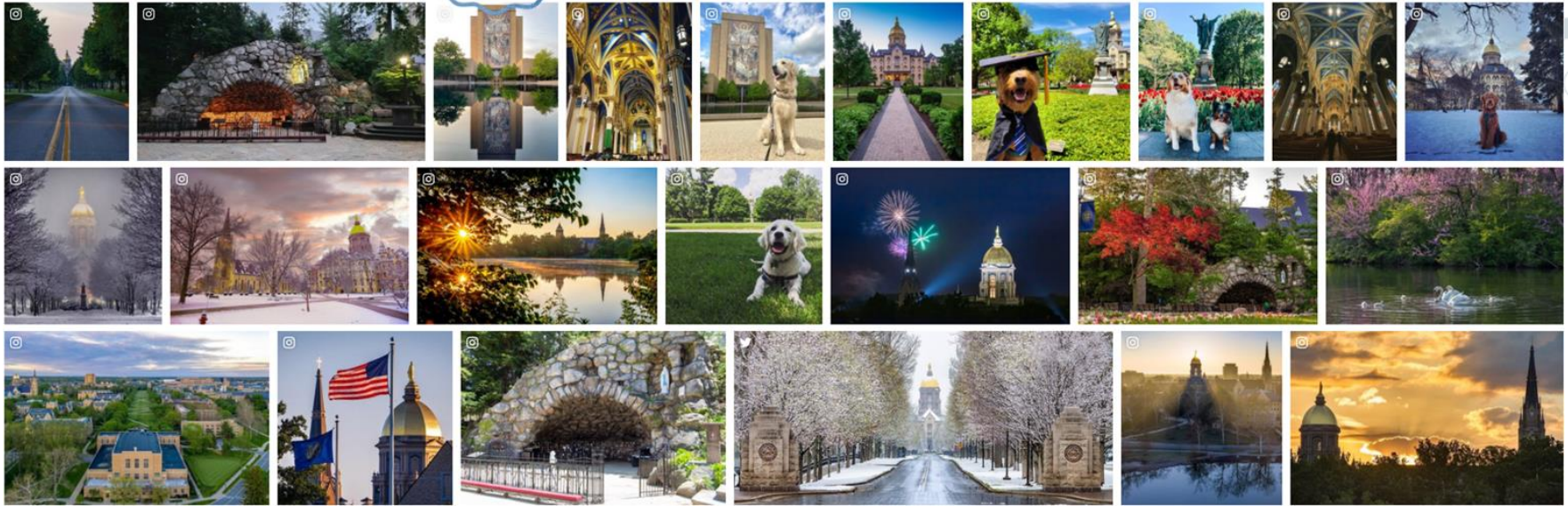
Source: https://www.visitsouthbend.com/notre-dame/

◎ *You can't connect the dots looking forward. You can only connect them looking backwards – Steve Jobs*

So

Let's talk about my dots backward.

Today's Agenda

- ◎ How I prepare for TOEFL exam?
- ◎ Life at Hewlett Packard Enterprise (HPE)
- ◎ Self-Learning Online Program
- ◎ Research Experience
- ◎ Teaching Assistant
- ◎ Recommendation for Studying abroad
- ◎ Guidelines for Preparing Application Materials

1.

How I prepare for TOEFL exam?

How to improve your listening skill?: Talk Show

The Tonight Show Starring Jimmy Fallon ✓
29.2M subscribers

Jimmy Kimmel Live ✓
18.4M subscribers

The Daily Show with Trevor Noah ✓
9.64M subscribers

Late Night with Seth Meyers ✓
4.26M subscribers

How to improve your listening skill?: News

Bloomberg Markets and Finance ✓
1.19M subscribers

CNBC Television ✓
1.97M subscribers

NBC News ✓
6.49M subscribers

Bloomberg Technology ✓
438K subscribers

ABC News ✓
12.7M subscribers

The Economist ✓
2.32M subscribers

How to improve your Listening Skill?: TV Show

TED is awesome

How to improve your reading skill?

◎ Skim and Scan

Paleontologists have argued for a long time that the demise of the dinosaurs was caused by climatic alterations associated with slow changes in the positions of continents and seas resulting from plate tectonics. Off and on throughout the Cretaceous (the last period of the Mesozoic era, during which dinosaurs flourished), large shallow seas covered extensive areas of the continents. Data from diverse sources, including geochemical evidence preserved in seafloor sediments, indicate that the Late Cretaceous climate was milder than today's. The days were not too hot, nor the nights too cold. The summers were not too warm, nor the winters too frigid. The shallow seas on the continents probably buffered the temperature of the nearby air, keeping it relatively constant.

Source: TPO 08 - 2

What do I actually read?

Paleontologists have **argued** for a long time that the **demise of the dinosaurs** was **caused by climatic alterations** associated with slow changes in the positions of continents and seas resulting from plate tectonics. Off and on throughout the Cretaceous (the last period of the Mesozoic era, during which dinosaurs flourished), large shallow seas covered extensive areas of the continents. **Data** from diverse sources, including geochemical evidence preserved in seafloor sediments, **indicate** that **the Late Cretaceous climate was milder than today's**. The days were not too hot, nor the nights too cold. The summers were not too warm, nor the winters too frigid. The shallow seas on the continents probably buffered the temperature of the nearby air, keeping it relatively constant.

◎ My note: climat -> 恐龍GG

Source: TPO 08 - 2

Try to Read Some English Books
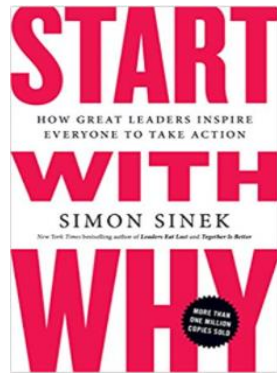
Simon Sinek   Carmine Gallo   Adam Grant   Robert Iger   James Clear
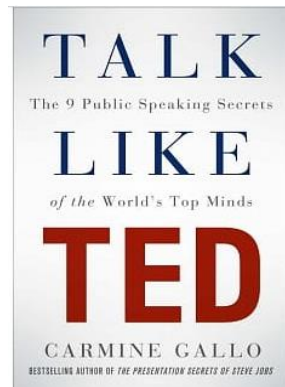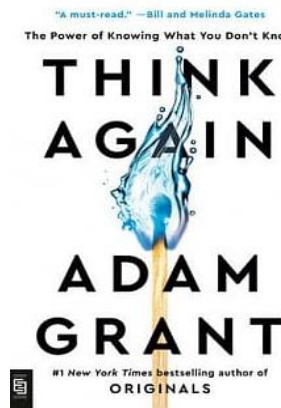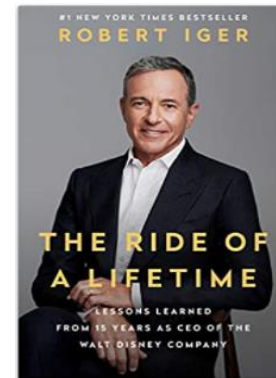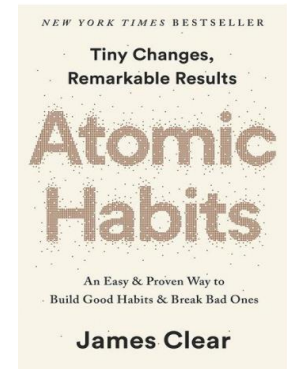
How to improve your speaking skill?

Echo method is awesome.

Recommendation on Writing

◎ Use simple sentences

◎ Mention key points in topic sentence c.f. in Chinese

◎ Exploit grammar check software (e.g. Grammarly)

◎ Learn LaTex while writing paper (Try to use Overleaf)

2.

Life at Hewlett Packard Enterprise (HPE)

Software Engineer Intern

What I learned during this internship?: You don't need to

Know everything

What I learned during this internship?: You need to

- Learn new things quickly
- Present your own work
- Socialize with others

3.

Self-Learning Online Program

Courses I took before

Stanford | NLP

CS224n: Natural Language Processing with Deep Learning

Stanford / Winter 2022

Natural language processing (NLP) is a crucial part of artificial intelligence (AI), modeling how people share information. In recent years, deep learning approaches have obtained very high performance on many NLP tasks. In this course, students gain a thorough introduction to cutting-edge neural networks for NLP.

These are from top universities and researchers in the world.

CS285

CALENDAR RESOURCES SYLLABUS STAFF MENU ≡

CS 285 at UC Berkeley

Deep Reinforcement Learning

Lectures: Mon/Wed 5-6:30 p.m., Online

IMPORTANT: If you are an undergraduate or 5th year MS student, or a non-EECS graduate student, please fill out this form to apply for enrollment into the Fall 2021 version of the course. Do not email the course instructors about enrollment -- all students who fill out the form will be reviewed. We will enroll off of this form during the first week of class. We will not be using the official CalCentral wait list, just this form.

Lecture recordings from the current (Fall 2021) offering of the course: watch here

Looking for deep RL course materials from past years?
Recordings of lectures from Fall 2020 are here, and materials from previous offerings are here.

DeepMind | Introduction to Reinforcement Learning with David Silver

Introduction to Reinforcement Learning with David Silver

DeepMind x UCL   This classic 10 part course, taught by Reinforcement Learning (RL) pioneer David Silver, was recorded in 2015 and remains a popular resource for anyone wanting to understand the fundamentals of RL.

Steven Skiena   Dept. of Computer Science   Stony Brook University   Books

Analysis of Algorithms Lectures

Introduction to mathematical analysis of a variety of computer algorithms including searching, sorting, matrix multiplication, fast Fourier transform, and graph algorithms. Time and space complexity. Upper-bound, lower- bound, and average-case analysis. Introduction to NP completeness. Some machine computation is required for the implementation and comparison of algorithms.

Contents of these Courses

How do we enforce the constraint?

$$\theta' \leftarrow \arg\max_{\theta'} \sum_t E_{\mathbf{s}_t \sim p_\theta(\mathbf{s}_t)} \left[E_{\mathbf{a}_t \sim \pi_\theta(\mathbf{a}_t|\mathbf{s}_t)} \left[\frac{\pi_{\theta'}(\mathbf{a}_t|\mathbf{s}_t)}{\pi_\theta(\mathbf{a}_t|\mathbf{s}_t)} \gamma^t A^{\pi_\theta}(\mathbf{s}_t, \mathbf{a}_t) \right] \right]$$

such that $D_{\text{KL}}(\pi_{\theta'}(\mathbf{a}_t|\mathbf{s}_t) \| \pi_\theta(\mathbf{a}_t|\mathbf{s}_t)) \le \epsilon$

Math is vital

$$\mathcal{L}(\theta', \lambda) = \sum_t E_{\mathbf{s}_t \sim p_\theta(\mathbf{s}_t)} \left[E_{\mathbf{a}_t \sim \pi_\theta(\mathbf{a}_t|\mathbf{s}_t)} \left[\frac{\pi_{\theta'}(\mathbf{a}_t|\mathbf{s}_t)}{\pi_\theta(\mathbf{a}_t|\mathbf{s}_t)} \gamma^t A^{\pi_\theta}(\mathbf{s}_t, \mathbf{a}_t) \right] \right] - \lambda(D_{\text{KL}}(\pi_{\theta'}(\mathbf{a}_t|\mathbf{s}_t) \| \pi_\theta(\mathbf{a}_t|\mathbf{s}_t)) - \epsilon)$$

1. Maximize $\mathcal{L}(\theta', \lambda)$ with respect to θ' ⟵ **can do this incompletely (for a few grad steps)**
2. $\lambda \leftarrow \lambda + \alpha(D_{\text{KL}}(\pi_{\theta'}(\mathbf{a}_t|\mathbf{s}_t) \| \pi_\theta(\mathbf{a}_t|\mathbf{s}_t)) - \epsilon)$

Intuition: raise λ if constraint violated too much, else lower it
an instance of *dual gradient descent* (more on this later!)

Source: https://rail.eecs.berkeley.edu/deeprlcourse/static/slides/lec-9.pdf

My recommendation for you guys: Missing Semester

◎ Missing Semester of Your CS Education – MIT

./missing-semester | lectures | about

The Missing Semester of Your CS Education

Classes teach you all about advanced topics within CS, from operating systems to machine learning, but there's one critical subject that's rarely covered, and is instead left to students to figure out on their own: proficiency with their tools. We'll teach you how to master the command-line, use a powerful text editor, use fancy features of version control systems, and much more!

Students spend hundreds of hours using these tools over the course of their education (and thousands over their career), so it makes sense to make the experience as fluid and frictionless as possible. Mastering these tools not only enables you to spend less time on figuring out how to bend your tools to your will, but it also lets you solve problems that would previously seem impossibly complex.

Read about the motivation behind this class.

Schedule

- 1/13/20: Course overview + the shell
- 1/14/20: Shell Tools and Scripting
- 1/15/20: Editors (Vim)
- 1/16/20: Data Wrangling
- 1/21/20: Command-line Environment
- 1/22/20: Version Control (Git)
- 1/23/20: Debugging and Profiling
- 1/27/20: Metaprogramming
- 1/28/20: Security and Cryptography
- 1/29/20: Potpourri
- 1/30/20: Q&A

Video recordings of the lectures are available on YouTube.

About the class

Staff: This class is co-taught by Anish, Jon, and Jose.
Questions: Email us at missing-semester@mit.edu.

Beyond MIT

We've also shared this class beyond MIT in the hopes that others may benefit from these resources. You can find posts and discussion on

- Hacker News
- Lobsters
- /r/learnprogramming
- /r/programming
- Twitter
- YouTube

https://missing.csail.mit.edu/

Full Lists of CS Related Video Lectures from US University

These are fantastic

Programming Language

1. CS106B: Programming Abstractions – Stanford University
Link: https://web.stanford.edu/class/archive/cs/cs106b/cs106b.1208/
2. CS 106L: Standard C++ Programming – Stanford University
Link: http://web.stanford.edu/class/cs106l/
Video: https://www.youtube.com/playlist?list=PLCgD3ws8aVdolCexlz8f3U-RROA0s5jWA

Computer System

1. CMU 15-213: Intro to Computer Systems - CMU
Link: https://www.cs.cmu.edu/afs/cs/academic/class/15213-s18/www/schedule.html
2. CMU 18-447: Introduction to Computer Architecture - CMU
Link: https://course.ece.cmu.edu/~ece447/s15/doku.php?id=schedule
Prof. Onur Mutlu's recent course: https://people.inf.ethz.ch/omutlu/

Operating System

1. CS124 – CIT
Link: http://courses.cms.caltech.edu/cs124/lectures-wi2017/
2. CS162 – UC Berkeley
Link: https://inst.eecs.berkeley.edu/~cs162/sp20/

Algorithm

1. CS170: Efficient Algorithms and Intractable Problems – UC Berkeley
Link: https://cs170.org/
2. CS473 – UIUC
Link: https://courses.engr.illinois.edu/cs473/sp2016/lectures.html

Compiler

1. CSEP 501 – U of Washington
Link: https://courses.cs.washington.edu/courses/csep501/18sp/video/index.html

Computer Vision

1. CS231n: Convolutional Neural Networks for Visual Recognition –Stanford University
Link: http://cs231n.stanford.edu/2017/
2. EECS 498-007 / 598-005: Deep Learning for Computer Vision – U of Michigan
Link: https://web.eecs.umich.edu/~justincj/teaching/eecs498/FA2019/

Natural Language Processing

1. CS224n: Natural Language Processing with Deep Learning – Stanford University
Link: https://web.stanford.edu/class/archive/cs/cs224n/cs224n.1194/
2. CS224U: Natural Language Understanding – Stanford University
Link: http://web.stanford.edu/class/cs224u/
3. CMU 11-411: Natural Language Processing - CMU
Link: http://demo.clab.cs.cmu.edu/NLP/#overview
4. CMU CS 11-747: Neural Networks for NLP
Link: http://phontron.com/class/nn4nlp2020/schedule/class-introduction.html
Video: http://phontron.com/class/nn4nlp2020/schedule/class-introduction.html
5. CMU CS11-737: Multilingual Natural Language Processing
Link: http://demo.clab.cs.cmu.edu/11737fa20/

Machine Learning

1. CS229: Machine Learning – Stanford University
Link: http://cs229.stanford.edu/
Video:
https://www.youtube.com/watch?v=jGwO_UgTS7I&ab_channel=stanfordonline

Deep Learning

1. Yann LeCun's Deep Learning Course – NYU
Link: https://cds.nyu.edu/deep-learning/
2. CS230: Deep Learning
Link: http://cs230.stanford.edu/

Reinforcement Learning

1. Introduction to Reinforcement Learning with David Silver - DeepMind & UCL
Link: https://deepmind.com/learning-resources/-introduction-reinforcement-learning-david-silver
2. Reinforcement Learning Lecture Series 2018 – DeepMind & UCL
Link: https://deepmind.com/learning-resources/reinforcement-learning-lectures-

Misc.

1. Parallel Computer Architecture and Programming – CMU
Link: http://15418.courses.cs.cmu.edu/tsinghua2017/
2. CMU 15-462/662: Computer Graphics - CMU
Link: http://15462.courses.cs.cmu.edu/fall2020/
3. CMU 15-445/645: Database Systems - CMU
Link: https://15445.courses.cs.cmu.edu/fall2019/schedule.html
4. CMU 15-721: Advanced Database Systems - CMU
Link: https://15721.courses.cs.cmu.edu/spring2019/schedule.html
5. The Missing Semester of Your CS Education
Link: https://missing.csail.mit.edu/
6. Introduction to Algorithms – MIT
Link: https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-to-algorithms-fall-2011/index.htm
7. Performance Engineering of Software Systems – MIT
Link: https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-172-performance-engineering-of-software-systems-fall-2018/index.htm
8. CS221: Artificial Intelligence: Principles and Techniques
Link: https://stanford-cs221.github.io/autumn2019/#schedule
Video:
https://www.youtube.com/watch?v=J8Eh7RqggsU&ab_channel=stanfordonline

Web for Open Course

1. MIT Open Courseware
Link: https://ocw.mit.edu/

Check my Web: https://chiayisu.github.io/resources/

4.

Research Experience

Research Areas

- ◎ Interactive Dialog System
- ◎ Natural Language Understanding
- ◎ Human-Computer Interaction
- ◎ Reinforcement Learning

Research Areas

Domestic Conferences

Da-Jinn Wang, Tsong-Yi Chen, **Chia-Yi Su**, "MedBERT: 基於BERT語言模型的中文醫學文本理解研究" [MedBERT: Chinese Medical Document Classification Based on BERT Language Model], Symposium on Digital Life Technologies (DLT-2021), Pingtung, Taiwan, R.O.C. May 14-15, 2021. (Chinese paper)

Tsong-Yi Chen, **Chia-Yi Su**, Da-Jinn Wang, Mong-Fong Horng , "中文自然語言對話系統—以豬隻疾病諮詢問答服務為例" [A Dialog System for Swine Disease Consultation in Chinese Language], 2020 Workshop on Consumer Electronics (WCE2020), Kaohsiung, Taiwan, R.O.C. pp. 484-489, December 11, 2020. **(Best Presentation Award)** (Chinese paper)

International Journal

Article

AidIR: An Interactive Dialog System to Aid Disease Information Retrieval

Da-Jinn Wang [1], Tsong-Yi Chen [2] and Chia-Yi Su [2,*]

Others

◎ Proposed Minister of Science Technology projects

◎ Conducted Minister of Science and Technology projects

◎ Composed final reports

5.

Teaching Assistant

Instruct Courses

◎ https://chiayisu.github.io/teaching/

Natural Language Processing Spring 2021

Graduate course, *National Kaohsiung University of Science and Technology (Jiangong Campus)*, 2021

Course Description

The course mainly introduces the theories and applications of Natural Language Processing (NLP). This course starts from basic concepts of NLP to-the-state-of-the-art NLP algorithms such as transformer. Also, this course will introduce how to apply the concepts that learnt in this course to task-oriented dialog system and introduce some concepts of reinforcement learning if time-permitted.

Older Courses

- Artificial Intelligence (Fall 2020)
- Natural Language Processing (Fall 2020)- Nanzih Campus
- Natural Language Processing, Spring, 2020
- Natural Language Processing, Fall, 2019

Teaching

Reinforcement Learning Spring 2022

Graduate course, *National Kaohsiung University of Science and Technology (Jiangong Campus)*, 2022

Course Description

Reinforcement Learning (RL) is applied to many applications such as dialog system, robotics, and AlphaGo. RL mimics the learning behaviors of human beings and endows the system with the ability to learn through the trial-and-error method. The course will introduce the foundamental theories and the advanced theories of RL. We will start from Markolv decision process to deep RL. Moreover, we will introduce the applications of RL. More specifically, we focus our applications on dialog systems. After this course, students will have foundamental concepts to do RL research.

Natural Language Processing Fall 2021

Graduate course, *National Kaohsiung University of Science and Technology (Jiangong Campus)*, 2021

Course Description

The course mainly introduces the theories and application of dialogue system. We first introduce natural language understanding (NLU). Then, we will introduce the concepts of reinforcement learning (RL). Finally, we will give lectures on the applications of dialogue system if time-permitted.

Mentorship

◎ Advised in-service master students on thesis

◎ Advised undergraduate students on software engineering course

◎ Advised undergraduate students graduation projects

6.

Recommendation for Studying abroad

◎ Maintain good undergraduate GPA

◎ Enhance your theoretical foundations

◎ Don't be afraid of mathematics

◎ Improve your English i.e. prepare TOEFL/GRE as early as possible

◎ Research, Research, and Research

◎ If you are CS major, enhance your programming skill as well

7.

Guidelines for Preparing Application Materials

SOP Guidelines

◎ Course-based MS: focus on courses and equipments that help to enhance your career paths

◎ Thesis-based MS or Ph.D.: focus on research

SOP Writing References

◎ How to write a personal statement (by Prof. McMillan at Notre Dame): http://blog.mcmillco.com/2013/12/12/how-to-write-a-personal-statement/

◎ CMU SOP GuideLine: https://drive.google.com/file/d/1vksD1zYwsuRU4Zy_mYDWYCkdnofBjmtW/view

◎ EVON's Writing Recipe: https://blog.essaycrafter.org/application-essays/

◎ SOP Do's and Don'ts with Samples: https://www.cantabenglish.com/blog/sop_writing_tips

◎ Remember to refer the format in each department's website before writing SOP

SOP Samples

◎ Eva's SOP Sample (CMU M.S. in Robotics Systems Development):
https://drive.google.com/file/d/18vgVAvU6kiNmcSfWryy2T6r_2Giqk9Tn/view

◎ 許凱傑's SOP Sample (Princeton University ECE Ph.D.)
https://medium.com/phd-in-america/eng-test-app-docs-eb5b5bd24c7a

CV Guidelines Dos

◎ Thesis MS or Ph.D.: Research experience first

◎ 2 full pages or 1 full page

◎ Start with verb

◎ Have quantitative information

◎ More information refer to:
https://www.cantabenglish.com/blog/howtowriteenglishcv

CV Guidelines Don'ts

◎ Don't write your CV in half page or one and half page

◎ Don't include your photos

◎ More information refer to:
https://www.cantabenglish.com/blog/howtowriteenglishcv

Letter of Recommendation (LOR)

◎ LOR Dos and Don'ts:
https://www.cantabenglish.com/blog/reference_letters

◎ Evon's Writing Recipe: https://blog.essaycrafter.org/application-essays/

◎ Eva's LOR Sample (CMU M.S. in Robotics Systems Development):
https://medium.com/momo%E7%9A%84%E6%A9%9F%E5%99%A8%E4%BA%BA%E7%95%99%E5%AD%B8%E5%A4%A2/%E7%94%B3%E8%AB%8B%E7%BE%8E%E5%9C%8B%E6%A9%9F%E5%99%A8%E4%BA%BA%E7%9B%B8%E9%97%9C%E7%A2%A9%E5%A3%AB%E7%B6%93%E9%A9%97%E5%88%86%E4%BA%AB-8b80197ce60d

◎ Write some quantitative data, if you can

Contact Professors (套詞)

◎ Sample1: https://www.thebiologist.org/blog/210424-how-to-write-english-email

◎ Sample2: https://medium.com/@sunfankeng/%E7%94%B3%E8%AB%8B%E7%BE%8E%E5%9C%8Bee-cs-phd%E7%B6%93%E9%A9%97%E5%88%86%E4%BA%AB-4-%E5%A5%97%E8%A9%9E-%E5%A1%AB%E8%A1%A8%E5%96%AE%E5%92%8C%E9%9D%A2%E8%A9%A6-dc921fecd257

◎ Remember to read professors' papers and projects and provide your point of view

◎ It's ok that the professor don't reply to you

◎ Don't criticize professors' works

Others

◎ 美國資訊工程研究所申請經驗分享 (by Alicia UC Berkeley CS Ph.D.): https://www.aliciatsai.com/blog/grad-application?fbclid=IwAR1oi2O9nTnXxQCWs5J48FPfBcAVW0jDP1wrBpuq4jqioy9UrVfNzoCNzJQ

◎ CMU SOP Guidelines: https://www.cmu.edu/student-success/other-resources/resource-descriptions/grad-sop.html

◎ How to Write a Bad Statement for a Computer Science Ph.D. Admissions Application (by CMU Professor): https://www.cs.cmu.edu/~pavlo/blog/2015/10/how-to-write-a-bad-statement-for-a-computer-science-phd-admissions-application.html

◎ Why Ph.D. (by Prof. Harchol-Balter at CMU): https://www.cs.cmu.edu/~harchol/gradschooltalk.pdf

◎ When life gives you lemons, make lemonade. – Anonymous

Steve Jobs Commencement Speech at Stanford University

Highly recommend you guys to watch it

Source: https://www.youtube.com/watch?v=UF8uR6Z6KLc

◎ Stay hungry, stay foolish – Steve Jobs

Thanks!