How to apply for MS in Autonomous Driving / Robotics?

--- A perspective from an ECE student at ZJUI
Author: Jie Wang
Final Program: University of Pennsylvania,
Master Science of Electrical Engineering(**MSEE**)
Date: August 2, 2024

Application Experience Sharing Salon

Who am I?

- Wang, Jie 王杰
- ECE 2001 Student
- Not a high GPA student
- Tech & Philosophy lover
- Founder & President of 哲咖社
  https://philocoffee.github.io/
- A beginner on the road of AI
- Someone would like to share experience & bug log with you today:)

My result: All in US Master

AD: 8 Program

- NEU MSECE
- UCSD MSECE-82
- Northwestern MSCompE
- UMich MSECE-ML,
- Duke MSECE-Big Data & ML
- Gatech MSECE-SIP & ML,
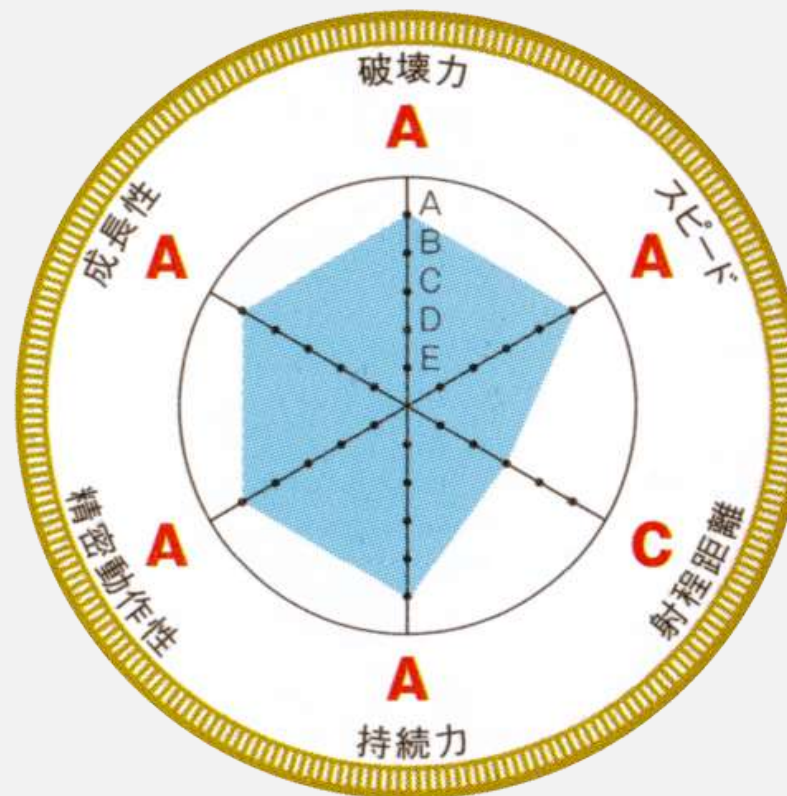- CMU MSECE (spring2025)
- Upenn MSEE- Information System

REJ: 5 Program

- Stanford MSEE
- UIUC MCS
- USC MSCS
- USC MSAI（买一送一）
- UCSD CS75: Robotics

1. Who are you?

■ Think carefully on your current resources:

    ■ GPA?

    ■ Publication?

    ■ Internship?

    ■ Competition?

    ■ Project?

    ■ Connection?

    ■ ...

    ■ And maybe most importantly:

      Ultimate Goal?

你手上有什么牌？

2. Where are you from?

- ■ ZJU-UIUC Institute
  - ■ ECE or EE?
    - □ EE with CS minor?
- ■ Experience at what school?
  - ■ Research at ZJU?
  - ■ Research at UIUC?
  - ■ Or even further exchange / summer school / online collaboration at …
- ■ What forced behind you to arrive at the corner of life decision?
  - ■ Family
  - ■ Hometown city
  - ■ Conference / Exhibition or just a book / moment

1. Who are you?

- My status when application:
    - ZJU GPA: 3.82　　　　　TOEFL: 104
    - UIUC GPA: 3.51　　　　GRE: 148+170+3.5
    - Publication: None -> 5th in ICICT2024, done from Dec23 to Jan24
    - Internship: Not list in my application
        - One SDE comp and one FPGA design comp
        - Not related & short, so not include in CV
    - Competition:
        - 2023 Shell Eco-marathon Autonomous Programming Competition
        - 2022 International Mathematical Contest in Modeling (Honorable Mention)
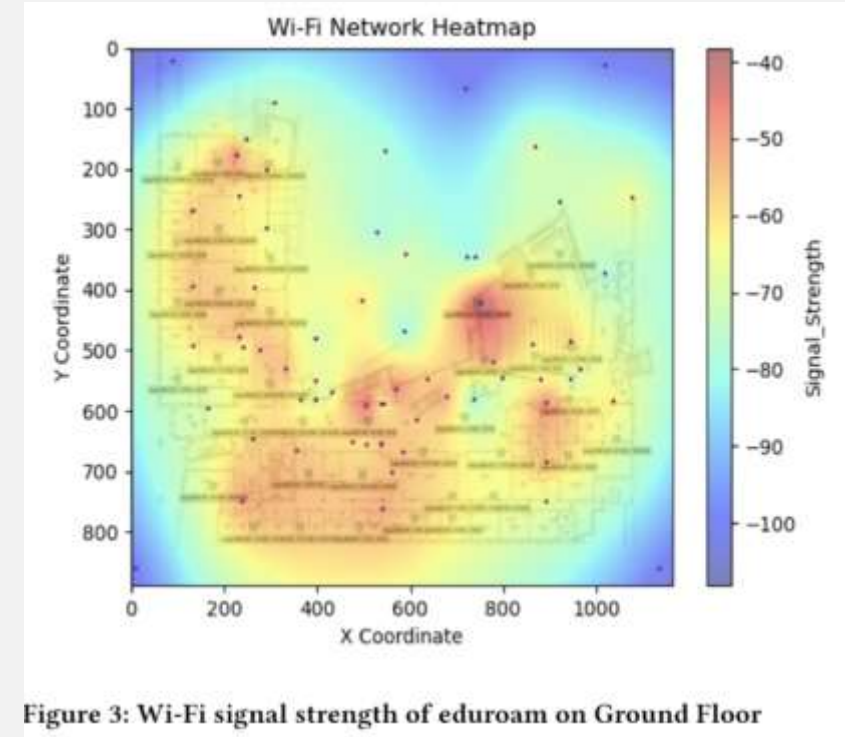
1. Who are you?

■ My status when application:

■ Project[course]

☐ CS438: Communication Networks Wireless Project -> An open-source Python Tool

☐ ECE391: Computer Systems Engineering Implementation -> MentOS

☐ CS225*: Data Structure Practice - Simplified Vaccination Registration System with C++

☐ ECE448: Artificial Intelligence with many MP extra credit completed

■ Connection

☐ CS438 -> Prof. Deepak Vashist

☐ ECE448 -> Prof. Mark Hasegawa-Johnson

Figure 3: Wi-Fi signal strength of eduroam on Ground Floor

My mini project for CS438: scanned the Thomas Siebel Center and report to UIUC Network Team

*CS225的大作业是Prof. KD 时代才有的

1. Who are you?

■ My status when application:

■ Project[research]

□ SU23: 人机交互 + 智驾系统 + LLMs

■ 指导：浙大国际设计院向为教授

➜ Paper to CHI2024[申请时在投]

□ SU22: 开源软件社区 + 软件工程架构分析

■ 指导：浙大软件学院万志远教授

□ SRTP: Apollo 自动驾驶小车的部署和测试

■ 指导：ZJUI Prof. Simon Hu

■ Connection

□ SU23 -> Prof. 向为

Apollo D-kit AD Test Car I played with

1. Who are you?

- **My status when application:**
  - **Teaching Assistant Experience**
    - FA23: MATH213: Introduction to Discrete Math
      - Head TA, led by 张萌教授
    - SP24: PHIL 206: Early Modern Philosophy
      - TA, led by Prof. Shao Kai Tseng
  - **Connection**
    - TA for MATH213 -> Prof. 张萌

  - **Notice:**
   - TA经验其实是很加分的，因为大部分学校本科生是不能当TA的，也算ZJUI的福利

TA experience also helps you!

3. Where are you going?

1. School Planning is all you need
倒金字塔的申请结构最为理想

- 列出你想去的学校，专业
- 思考你的对策
- https://github.com/PhiloCoffee/How-to-apply-for-US-master/blob/main/Ask-The-Fxxking-GPT/什么是倒金字塔申请.md
- 经验之谈：
  - 多申点彩票，你只需要一所学校
  - 可以在没提交前，将某个保底学校的硕士申请转为PhD申请，虽然时间有劣势，但相对于转化为可用选项 (还是要在有一定的研究成果的基础上才考虑说申请PHD)
  - 可以试试看套磁老师，申请博士
  - 以上最好在你已经有点十拿九稳时，再自我选择
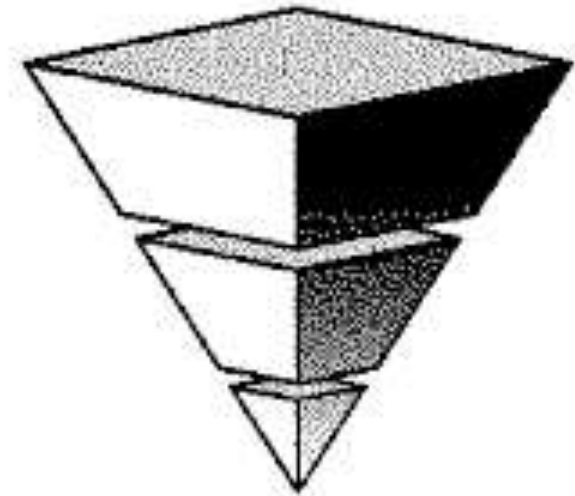
3. Where are you going?

1. School Planning is all you need
倒金字塔

2. 学长学姐们的申请结果很可能就决定
了你的下限/上限：
- 多看看飞跃手册，越早越好
- 与同三维，类似经历的录取结果
- 套磁学长学姐时礼貌而有逻辑

序号	单位名称	就业人数
1	伊利诺伊大学厄本那-香槟分校(UniversityofIllinois,Urbana-Champaign)	33
2	浙江大学(ZhejiangUniversity)	20
3	浙江大学	16
4	加州大学圣地亚哥分校(UniversityofCalifornia,SanDiego)	8
5	卡耐基梅隆大学(CarnegieMellonUniversity)	7
6	密歇根大学安娜堡分校(UniversityofMichigan,AnnArbor)	7
7	加州大学伯克利分校(UniversityofCalifornia,Berkeley)	6
8	斯坦福大学(StanfordUniversity)	5
9	佐治亚理工学院(GeorgiaInstituteofTechnology)	5
10	比亚迪股份有限公司	4
11	南洋理工大学(NanyangTechnologicalUniversity)	4
12	香港大学(UniversityofHongKong)	4
13	苏黎世联邦理工学院(SwissFederalInstituteofTechnologyZurich)	3
14	新加坡国立大学(NationalUniversityofSingapore)	3
15	杜克大学(DukeUniversity)	3

浙江大学就业服务平台

3. Where are you going?

1. School Planning is all you need
倒金字塔

2. 学长学姐们的申请结果很可能就决定了你的下限/上限：
- 多看看飞跃手册，越早越好
- 与同三维，类似经历的录取结果
- 套磁学长学姐时礼貌而有逻辑

3. RTFM & STFW：
- *Read The Fxxking Mannual*
- *Search The Fxxking Website*
-> Be cautious on the information you can obtain online.
- **NEW: *ASK THE FXXKIG GPT***

" 暨RTFM和STFW,后ChatGPT时代的我们也应该有一个新的缩写：
Ask The Fucking GPT(ATFG)
人工智能大放异彩的时间点，会使用AI工具对个人的工作效率有着极大的提高, 如果你会prompt engineering, 可以更好的使用LLMs-based agent, 那么你会有无数个agents用极快的速度完成你指定的需求。"

For more information 👉

我们便于申请信息分享，写的一个Repo:
https://github.com/PhiloCoffee/How-to-apply-for-US-master/

Why AD/Robo?

Motivation comes from the research / internship and future career path…
A paradigm shift of LLMs for Autonomous Systems Has Arrived…

☐ How to let the computer understand the action of a human?

☐ Previous research experience on:
- ☐ Risk Warning System
- ☐ for Autonomous vehicle

Insight:
- LLMs for general reasoning ability.
- Grounding DINO + SAM to get musk-level information
- MOT for pedestrian tracking

What I learned:
- Computer vision practice
- *Pipeline and Top-tier Conference*
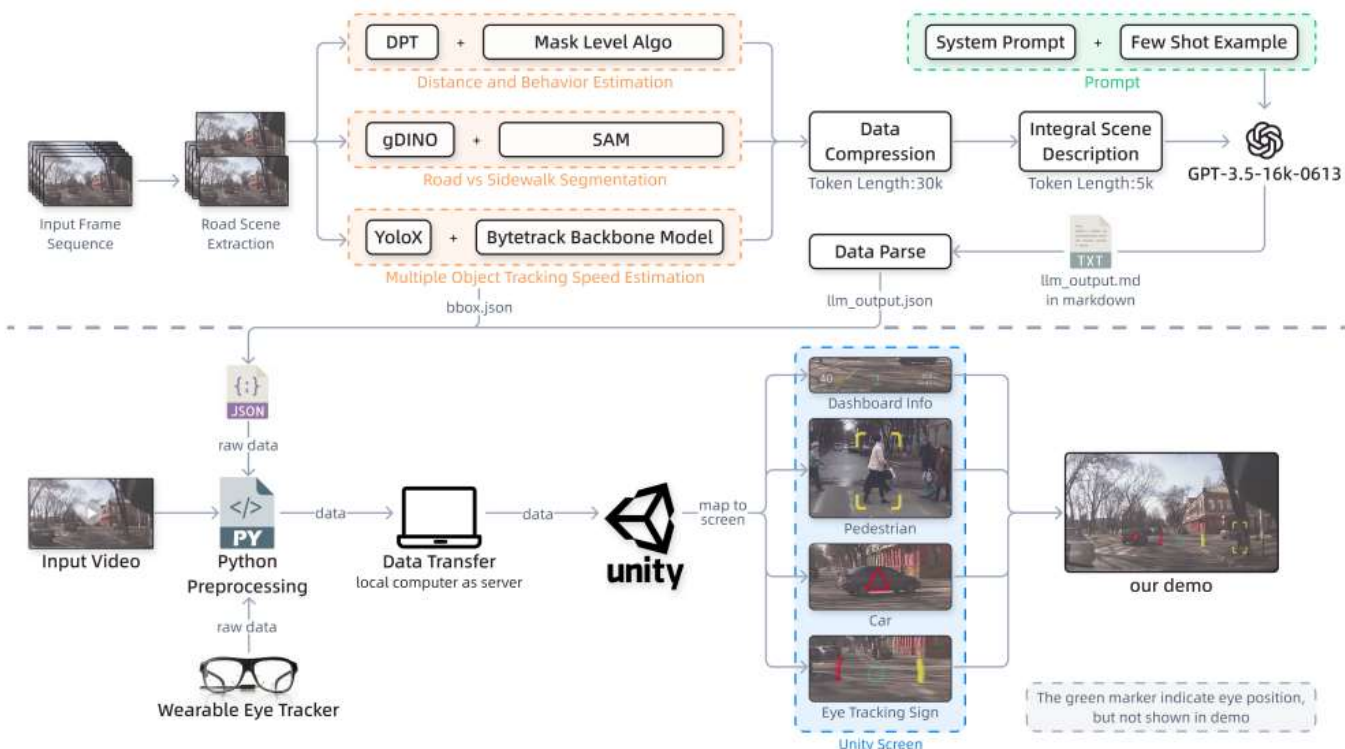- **Interest of doing research**

Fig. 2. System design of visionary co-driver

Figure: LLMs for reasoning potential risk on the road

Further exploration in ECE449: Machine Learning

☐ How to let the computer understand the action of a human?

☐ **Refer-MOT + CLIP**

Insight:
- down-sample video into subsequent frames
- inference the scenario with object detection information.

This course is taught by Prof. Gaoang Wang at ZJU-UIUC.

It includes a series of CV/NLP related projects extended from CVNext Lab: **https://cvnext.github.io/**

Figure: ECE449-Machine Learning Final Project

Motivation of our question:

☐ **How to let the computer understand the action of a human?**

    ☐ **Refer-MOT + CLIP**

    ☐ **Risk Warning System for Autonomous vehicle**

Figure: ECE449-Machine Learning Final Project
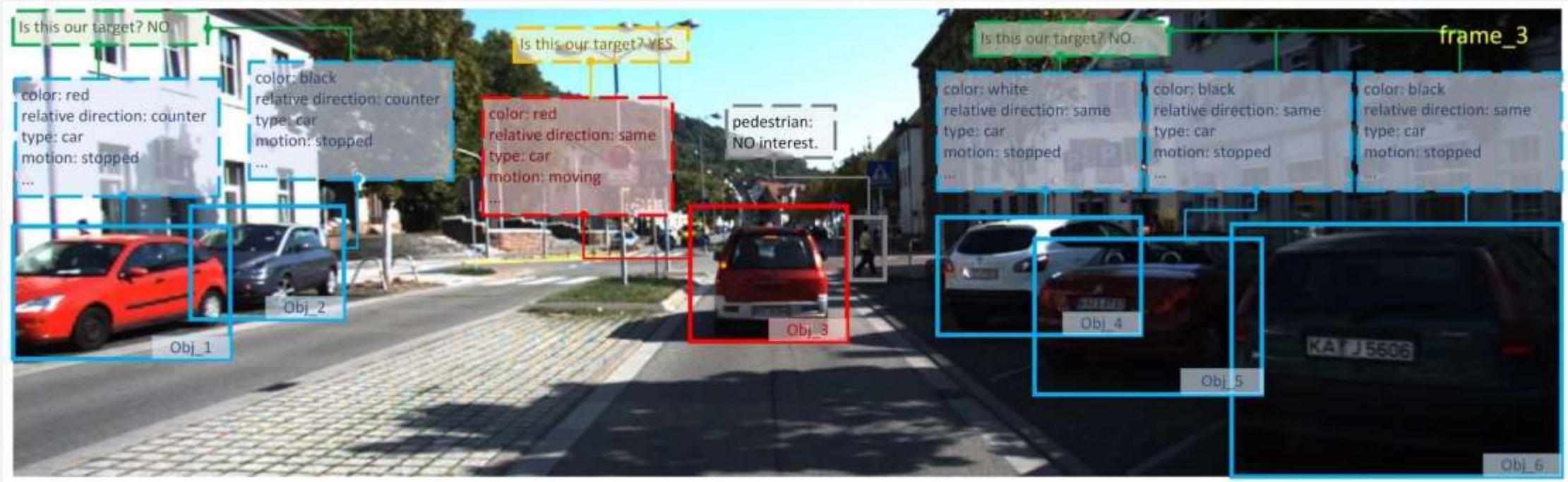
Towards Robot Learning with Insights from Computer Engineering

Bottleneck 1: Mechanical limitation, I don't know ME!

Recent solution: Unitree Go2, Humanoid…

Shortcoming: Need more experience on embedded systems

Solution: Robomaster, Robo Cup, Research….

Bottleneck 2: How to learn these great things at ZJUI?

Recent solution: ECE448, ECE449, ECE486 and ECE470

Shortcoming: not enough for implementation level knowledge

Solution: Competition, Research and Internship

Tairan He ✓
258 posts

Tairan He ✓
@TairanHe99 Follows you

Robotics&AI PhD Student @CMU_Robotics
Research Intern at @NVIDIA this summer
Prev: @MSFTResearch @sjtu1896
Embodddied AI; Humanoid; Robot Learning

📍 Santa Clara 🔗 tairanhe.com 📅 Joined December 2022

371 Following   2,020 Followers
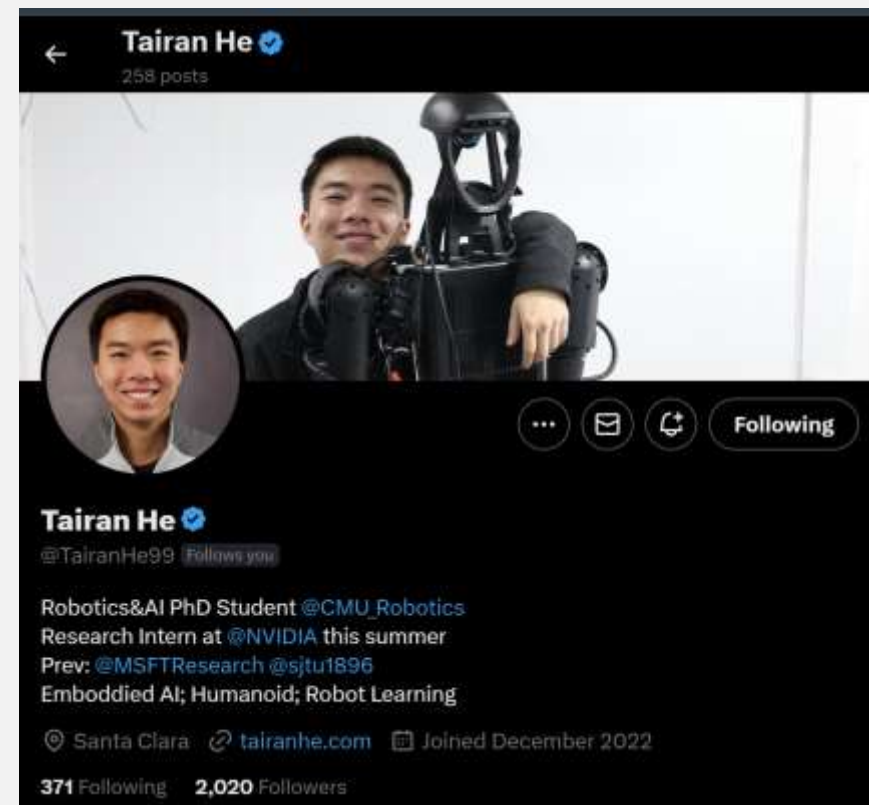
Tairan He: WhynotTV, rising
start of Robot Learning

■Mine:锐思搏途RESPECT

- ■ 10/10分推荐,比起中介,更像顾问,辅助我的成长
- ■ 很nice而科学的申请流程
- ■ Base 广州,线上/线下沟通

■ 是否选择找中介是一个很个人化的事情,有点像是PhD,找到好老板便如虎添翼,找到渣导就雪上加霜。

- ■ 我的理由:
  - □ 需要超过GPT4V的专家辅助我
  - □ 节省时间和精力
  - □ *"在申请季不那么迷茫而徘徊"*

Brandon 白老师

锐思搏途教育咨询创始人
心理咨询硕士,香港专业辅导协会会员,职业促进咨询师
8年海外研究生申请经验,指导300+学员申请,成功率100%
学员录取包含哈佛,耶鲁,斯坦福,麻省理工,加州理工,苏黎世联邦理工,
卡内基梅隆,牛津,剑桥,新国立,南洋理工等世界顶级名校

Christina 黎老师

锐思搏途教育咨询合伙人
Top985 理工类本科/硕士,资深申请全案老师
11年留学行业从业经验,曾任多家知名机构研究生申请组负责人
世界Top30顶级名校录取大满贯,曾指导南京大学,中山大学
电子科技大学等院校学员创造学院最佳申请战绩

图: 我的申请顾问组合
我跟冰哥大二就聊过了,对申请和未来有一个粗略的规划,黎老师的文书也特别给力!

■**比较坑的中介机构：**

- ■新东方： 用新手老师练手学生，申请系统都不会写
- ■新航道： 同上
- ■中枢留学： 匹配到的网申老师不够负责
- ■启德教育：大机构，选项50%保底
- ■再来人：**导致至少3个全聚德**
  - □But:"*再来人的Joanna老师不错*"

■**当然，申请是否要中介是个人化的，最终看自己是否需要**

有些中介机构就是坑你钱。。。

列举名誉较差的申请中介机构需要非常谨慎，因为公开点名可能涉及法律和道德问题。这里提供一些常见的警示标志和建议，以帮助你在选择中介机构时做出明智的决策：

警示标志

1. **夸大宣传**：声称与所有顶尖大学有内部关系，保证录取。
2. **过高收费**：收费远高于市场平均水平，没有合理的服务说明。
3. **合同不透明**：合同条款复杂，不明确具体服务内容和退款政策。
4. **假冒成功案例**：展示虚假的成功案例和伪造的学生反馈。
5. **缺乏专业团队**：没有经验丰富的导师和咨询师，团队背景不透明。
6. **强制要求签约**：不允许学生有足够的时间思考和选择，强迫签约。
7. **隐瞒负面评价**：网上负面评价较多，但中介机构极力掩盖或删除。

避免误入陷阱的建议

1. **多方调查**：通过网络、社交媒体和论坛了解该中介的评价和口碑。
2. **咨询校友和前辈**：向曾使用过中介服务的校友或前辈咨询他们的经验和建议。
3. **比较多家机构**：不要只听一家中介的建议，多比较几家机构的服务内容和费用。
4. **核实资质**：确认中介机构的合法资质，了解其注册信息和经营状况。
5. **看真实案例**：要求查看真实的成功案例，并核实这些案例的真实性。
6. **认真阅读合同**：仔细阅读合同条款，确保所有服务内容和收费明细清晰明确。
7. **咨询学校意见**：一些学校的国际学生办公室或官方网站可能提供合法的中介推荐名单。

通过这些方法，你可以更好地判断一个申请中介机构的可靠性，避免选择那些名誉较差的中介，确保自己的申请过程顺利。

Advisor or Not: 要不要找中介?

■比较好的中介机构：
- ■RESPECT
- ■领录： 风评还行 商科很强
- ■世毕盟：感觉跟交大合作很深
- ■胡一帆的个人工作室
- ■To be complete on Github Repo

■The best & most important:
- ■Yourself 你自己
- ■Be responsible for your own future
- ■Not only grad application, but also job market…

冰哥的微信和机构公众号

Github Repo: 如何申请

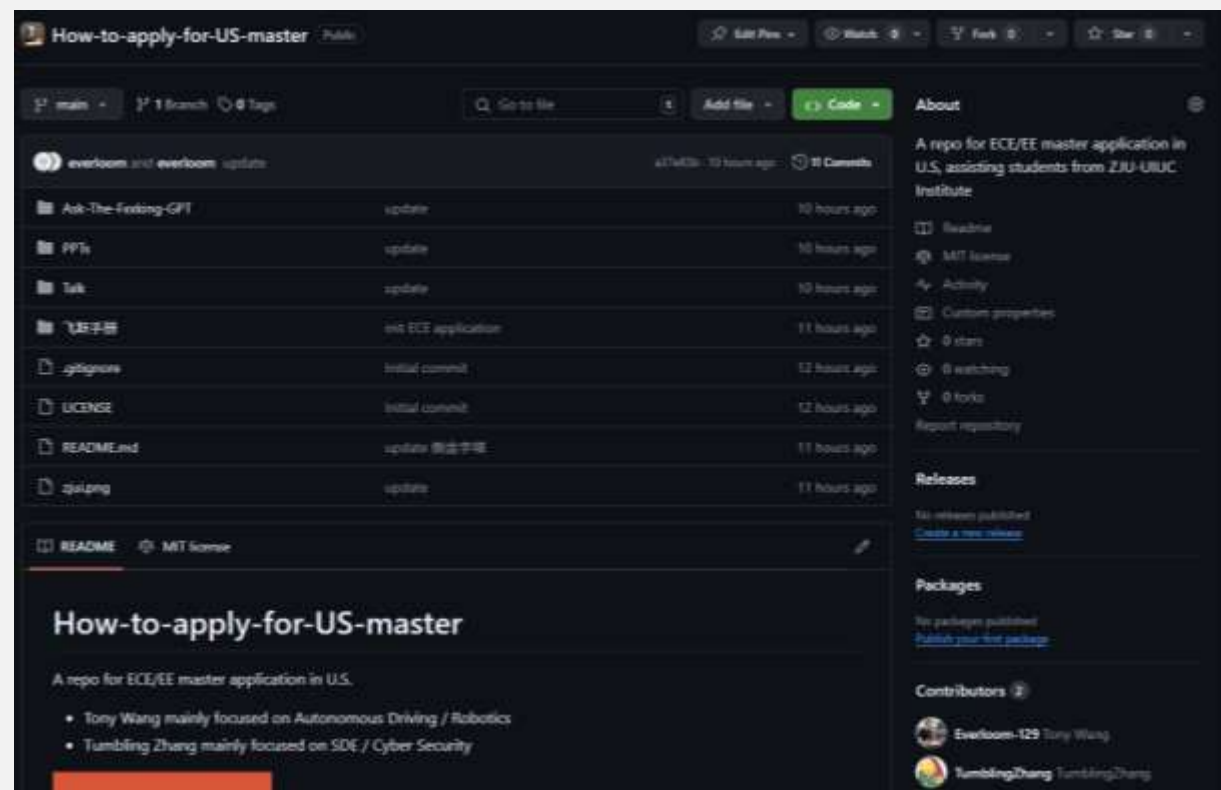■我和几位分享人一起建了一个仓库，用于同学们分享申请经验
  ■ 会有更多同学来分享内容，
  ■ 希望对大家有帮助
  ■ 欢迎STAR, ISSUE, PR！

■内含：
  ■ATFT指北
  ■ 选校助手
  ■PPTs
  ■ 聊天记录总结助手
  ■Talk and more...

地址：https://github.com/PhiloCoffee/How-to-apply-for-US-master

My result: Why UPenn in the end?

■AD:
- ■NEU MSECE
- ■**UCSD MSECE-82**
- ■Northwestern MSCompE
- ■UMich MSECE-ML,
- ■Duke MSECE-Big Data & ML
- ■**Gatech MSECE-SIP & ML,**
- ■**CMU MSECE (spring2025)**
- ■**Upenn MSEE- Information System**

■Reason:
- ■Not so crowded
- ■Strong Robotics + Computer Vision
- ■New BE degree in AI
- ■Top 1 Business School: Warton
- ■Nvidia + Prof. Dinesh: LLMs enhanced Robot Learning
- ■*I contacted several professors, and they said I can go research in Fall 24.*

最后，送给各位的话：

- *"我远远大于我的大学，我始终相信，人生是一个长期的均值回归，人生各个阶段的升职也好求职也好，这只是这条长达几十年均值回归上的一点点小噪音，你最后一定会和你的付出、能力与野心匹配上，所以我们不必为了一些短期的噪音而过多的焦虑。"*

--- Neal@WhynotTV

- My life path is so unique and splendid, so I may figure a solution that only suits me.

- 希望大家带着竺老两个问题的答案，找找未来的方向 🧭

祝各位申请顺利，心想事成!
Thanks for Listening
--- Q&A Session