Graduate Students: Research Expectations and Subsidies

Network Science Laboratory

- Newly re-established laboratory at NSYSU ICE (URL: nslab.nsysu.edu.tw)
  - focus on advancing understanding and development of **cutting edge research** in network science
  - study complex network representations in all forms (e.g. computer and communications networks, smart electrical grids)
  - lead to **predictive models and insights**
    - how networks behave and evolve ⇒ system understanding
    - employed for development of engineering solutions to problems in communications and power systems

Research Team Recruitment

- Wanna to join my research team?
  - **e-mail me** (kcleung@ieee.org) your application with the following:
    - your CV, academic transcript, English test scores
    - your research publications, if any
    - your proposed research work
      - what research problem to be solved?
      - how your work differs with existing work?
      - expected research contributions from your work
    - brief account about your academic/career goals after graduation, and what you plan to learn and achieve when you become a member in my team
  - feel free to e-mail me for further information

- Successful applicant
  - admitted as official member in my research laboratory
  - offer you world-class research training
  - financial support / incentives: based on research performance

您畢業後想做到什麼?

What would you WANT to achieve after graduation?

Achievement Goals

- *High-paid* job in renowned companies (such as TSMC, Citadel)
  獲得知名企業的*高薪*工作 (例如: 台積電, Citadel)



經濟日報 > 國際 > 國際焦點

從6.9萬名申請者中挑選實習生 Citadel尋找的是數學天才

億萬富豪Ken Griffin在Citadel和Citadel Securities LLC的得力干將，從69,000名申請者中精挑細選了這些少數幸運兒來公司實習，這家金融巨頭希望藉此發掘下一代數學和電腦天才。路透

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彭博 Bloomberg

Source: https://money.udn.com/money/story/5599/7401373

Achievement Goals (Cont'd)

- Graduate study with scholarship / studentship in *top* research teams at ***world renowned*** universities (such as USC)

  獲得獎助學金在*世界知名大學*(例如: 南加大)內的*頂尖*研究團隊進行研究學習



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DFFR: A flow-based approach for distributed load balancing in Data Center Networks☆

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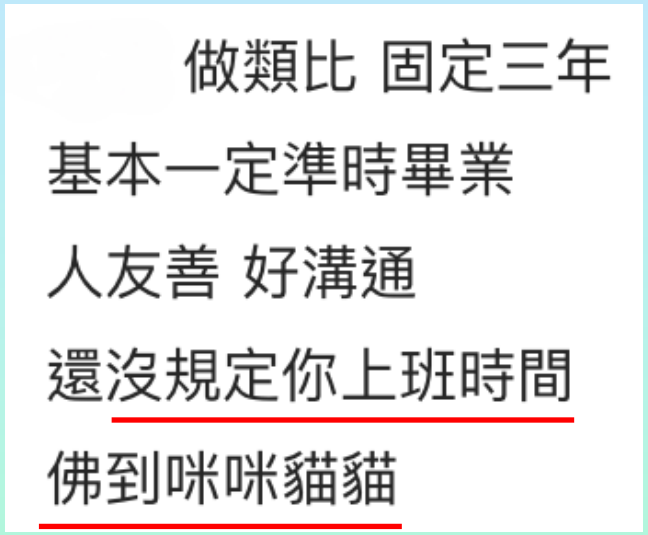
- My FYP student: HKU (B.Eng) → USC (Ph.D.) → NVIDIA

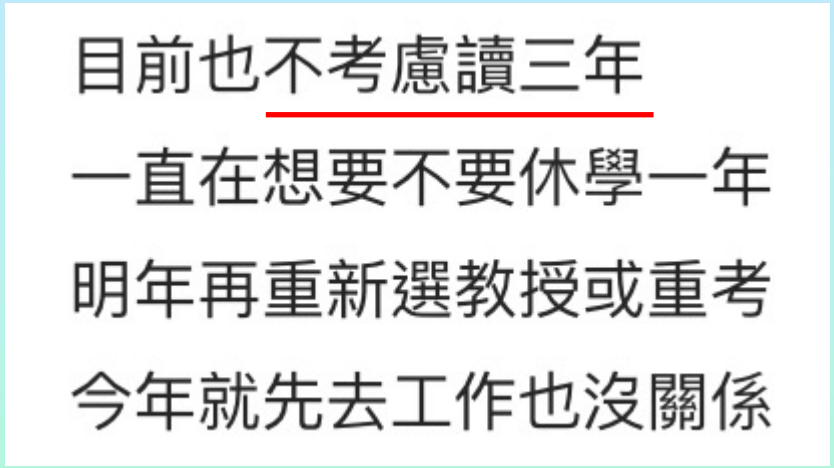
Graduate Study

- Coursework requirements
  - take and pass certain required and elective courses
    - similar to undergraduate education
- Thesis / dissertation (學位論文) requirements
  - conduct academic research leading to production of thesis / dissertation
    - *independent, original* research study, coached by a faculty member in the form of apprenticeship (學徒制) [***typical*** training mode]
    - generally yield a number of peer-reviewed research publications (documented research findings published in books, journals, and conference proceedings) during the course of the study
    - give an oral defense as public presentation and defense of your study
- Extremely important for you to find *suitable* thesis advisor

What Incompetent Students Expect Advisors?



Source: https://www.dcard.tw/f/graduate_school/p/256587304



Source: https://www.dcard.tw/f/graduate_school/p/256384199

1. Fixed study duration, better to be in 2 years
2. Lack of / no research (working hour) expectations
3. Nice, easy to communicate (i.e., flexible)

⇒ find a for-profit universities (營利學校 / 學店), pay money and get your degree wanted, and maybe you can also save 2-3 years!

Why Studying at Reputed Universities?

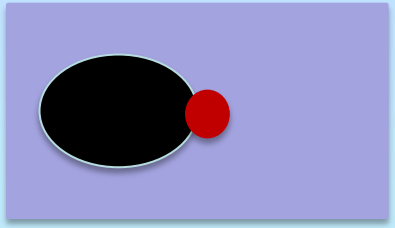
- Degrees widely recognized in academia and industries
  - qualification holders *perceived* to be more "advantageous" to obtain offers for further study at world-renowned universities and/or for work in prestigious (盛名的) companies
  - graduates expected to receive ***quality*** education and training
    - successful study: *expand* capability and *widen* way of thinking
- Opportunities to work with world-renowned faculty
  - able to participate in teams conducing *world-class research*
    - help make contributions to society
    - may be able to make your name (留名) on research fields
- Stronger alumni network
  - smarter / more capable persons likely to be *more* influential in professions
- University reputation varies over time, depending on:
  - quality of university graduates (lack of proper QC ⇒ recognition drop)
  - quality of research work done

Expectations from Prospective Students

- Importance (in decreasing order):
  - ***proactive***, hard-working, ***strong*** sense of responsibility, upholding (維護) academic integrity (academic work done in *honest* and *ethical* manner)
  - capable of acquiring ***new*** knowledge
  - excellent analytical and problem-solving skills
  - excellent proficiency in Mathematics
  - ***fluent*** in English (read, write, speak, listen)
  - ***creative***: able to make new things or think of new ideas
  - ***strong*** technical and systems knowledge, including computer and programming skills
  - good interpersonal skills

- If you have a ***strong desire*** **to equip them,**
  read next

Why English?



- Communication language for scientific exchanges (交流) of ideas and dissemination (發放) of results among people ***all over the globe***

- **Possible reasons**
  - influences due to key scientific/professional organizations (political influence ⇒ scientific influence)
  - *language simplicity*
    - ❖ words: combinations of Latin alphabet of 26 letters
    - ✓ numbers: represented by Arabic numerals

⇒ **Need to attain good proficiency in English**

- enable us to read *first-hand*, *original* technical findings and reports, instead of translated, possible lossy and outdated materials
- facilitate (促進) idea exchange and dissemination

How to Improve Proficiency in English?

- Targets
  - able to ***communicate*** with others ***effectively*** in English
  - no *ideal* speakers in real world
    - ⇒ need to cope with different accents (口音), imprecise / incorrect pronunciation (發音) and intonation (語調)
- Extend your exposure in English-speaking environment (practice makes perfect)
  - **attend EMI courses**, instead of their CMI counterparts
  - watch English documentaries, say, in YouTube
  - read English newspapers, documents, books, …
  - go along with English-speaking classmates and friends
- Remember: ***No*** such thing as free lunch

Research Atmosphere

- Research environment
  - expected to conduct research activities with *reasonable* portion of time in the laboratory
- Coaching approaches / policies
  - *on-demand* individual meeting
  - research group meeting: each student expected to give presentation about work done in reporting period (two weeks in general)
  - progress report: document research findings in reporting period, indicate how raised comments from advisor are addressed, and what to do next (generally due by 5 p.m. the day before meeting)
  - weekly timesheet of work done (due by noon on every Monday)

Graduation Requirements

- Master student
  - able to conduct and complete academic research on a topic satisfactorily
  - milestones of achievement:
    - ❖ able to complete a piece of research work and submit 1 paper for possible publication at flagship international conference and/or journal (expected by the end of first year of study)
    - ❖ acceptance of at least 1 journal paper, or acceptance of at least 1 conference paper and submission of at least 1 journal paper ***BEFORE*** proceeding for oral examination

Graduation Requirements

- Doctoral student
  - able to conduct and complete independent academic research under same research theme for a couple (say, 3) of topics satisfactorily
  - milestones of achievement:
    - ❖ able to complete a piece of new research work and submit 1 paper for possible publication at flagship international conference and/or journal (expected by each year of study)
    - ❖ acceptance of at least 3 papers, and all work with their journal papers submitted or accepted ***BEFORE*** proceeding for oral examination

Research Subsidy

- Research subsidy for graduate students
  - offered in merit basis: fixed amount of payment (called ***subsidy unit***) granted upon completion of each research milestone
  - research milestones (1 subsidy unit paid unless stated otherwise):
    - ❖ acquisition of research preliminaries
    - ❖ skills for literature study
    - ❖ determination of research topic
    - ❖ research publication (for each paper)
      - research problem formulation and analysis
      - performance evaluation
      - paper submission
      - paper acceptance (2+ subsidy units, based on quality of conferences / journals)