114-1 電工實驗（通信專題）

Final Project: Ideas and Rules

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Paper 3 Debate Review

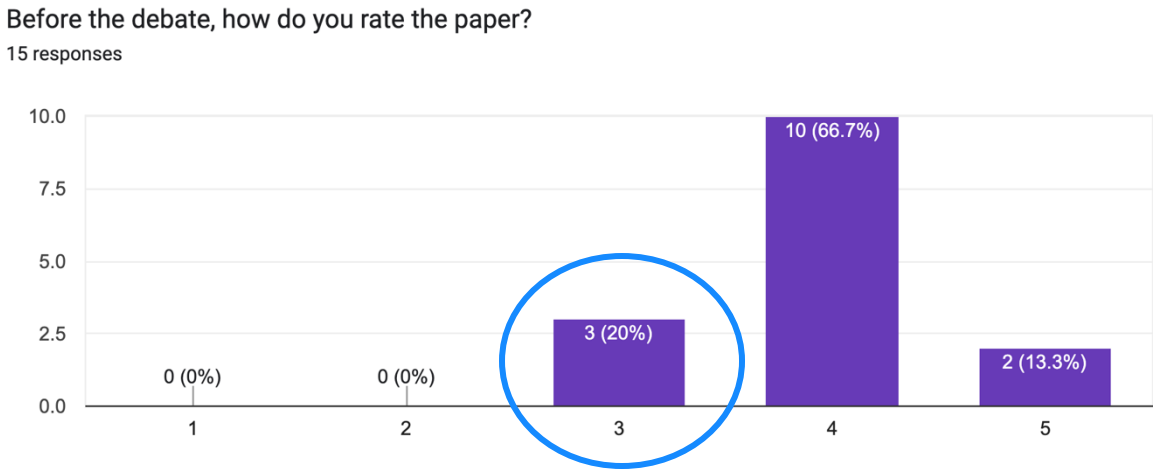
Feedback from the audience - 1

- 正方方面論述跟介紹的地方很清楚也很淺顯易懂；反方的論述可以再更精細一點
- Defense: Need more details about explaining the formulas and the meaning. Overall, it's pretty good.
  Offense: The concerns are ok but not so critical. The limitation of wifi is not the paper wants to discuss. I think the main contribution of this paper is the mathematical concept and AO method. The experiments are not the best but acceptable.
  ps.張亞誠好帥 💔
- 主要是覺得正方講的很好
- 感覺反方提的比較像是未來可以改進的方向，而不是整個實驗最核心的部分，但兩邊也都做得很好
- Offense side raised very practical concerns under certain scenarios, as well as the defense side did a very good job limiting the use cases for the new method proposed.

Feedback from the audience - 2

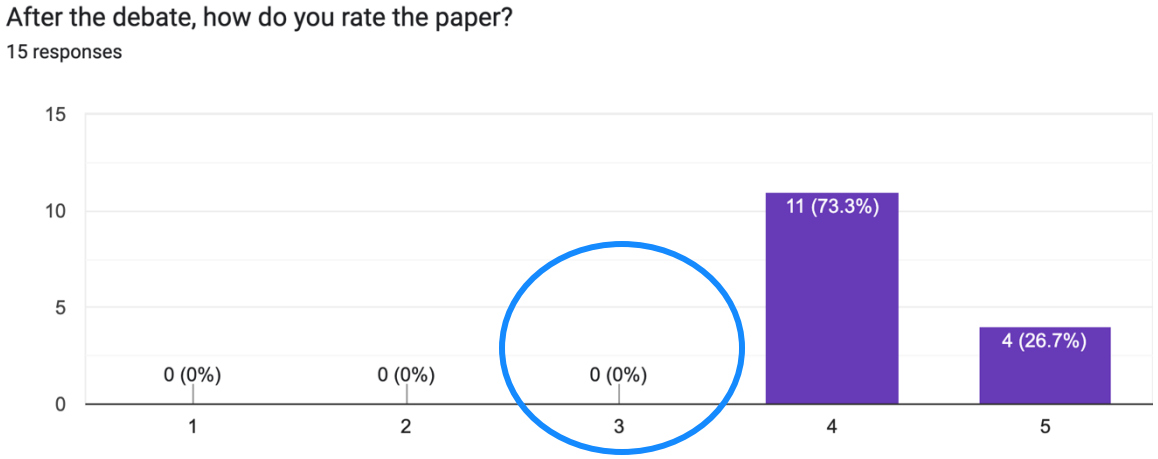
- 正方：整體而言有站住腳，有把這篇的contribution奠定好。
  反方：The expected probability of successful transmission 的公式來源與各項代表的大略意義未稍加說明，看了有點久還是不太確定公式怎麼算的（抱歉我弱）。
  各點選擇與說明表現不錯，唯獨可能沒有一種致命性，在論點的發展上可以增添力度。
  在最終辯論時，有許多「可能」的說辭，會有一種好像也不需要現在就考慮或者一種擠出說辭的感覺（但沒關係）。
- 正方我覺得整理的滿清楚的。唯一比較可以說的點可能是我覺得中間算式的部分有點太多，有點影響整體的節奏，但overall是非常好的，而且回答的也非常言之有物。
  反方的論點我蠻喜歡前面的部分，的確要考慮關於anchor之間的遮擋問題，還有z direction的實驗，有的話這篇論文會更完整，但我覺得沒有很影響整體做出來的結論。小可惜的是感覺有些地方沒有很熟，讓argument聽起來小心虛。
  整體是個很棒的debate，時間如果充足的話感覺會更有趣。

How the paper is rated among the class



Before the debate

Average = 3.93



After the debate

Average = 4.27

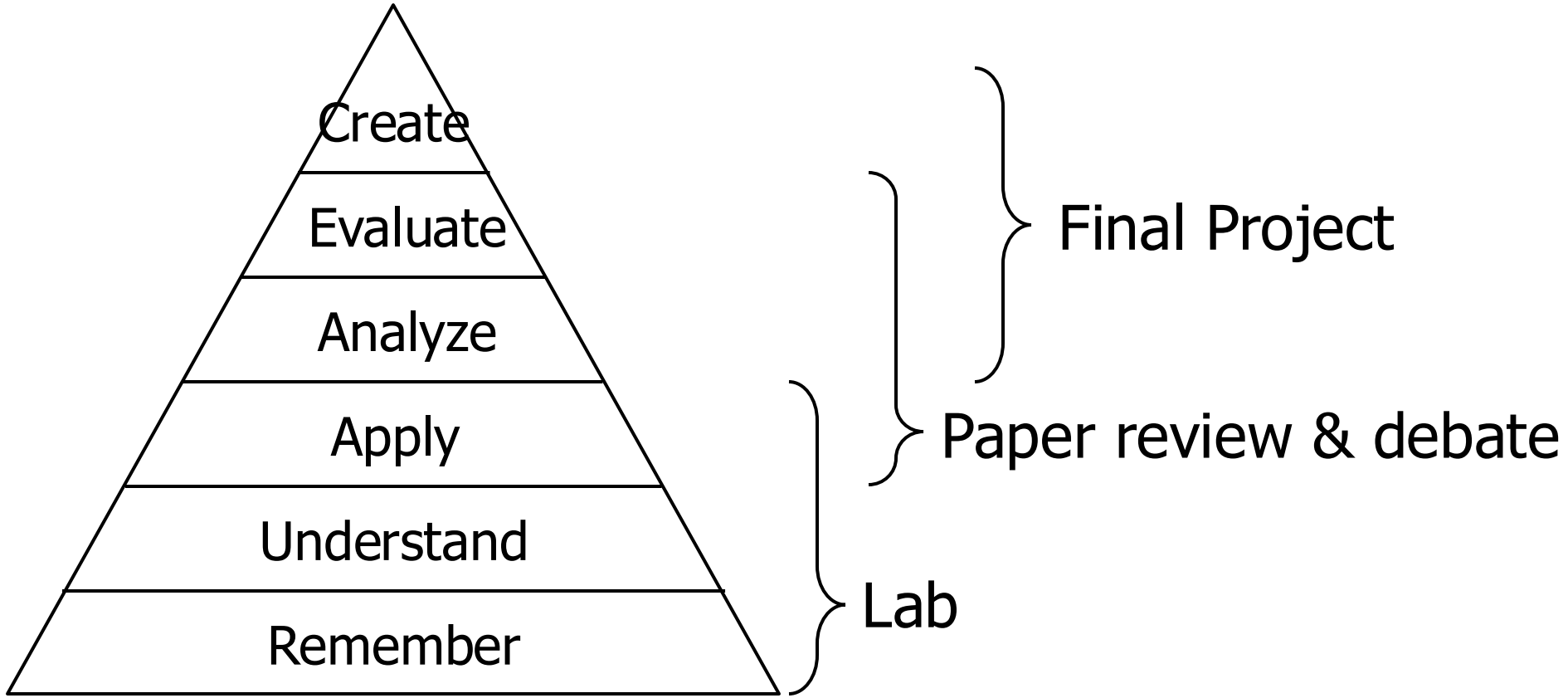
本學期第一次，辯論後 paper 評分變高！

Final Project

Let's start with some cool demos

- **See WiFi with an Antenna Array**
  https://www.youtube.com/watch?v=sXwDrcd1t-E&ab_channel=Jeija
- **Acoustic cameras can SEE sound**
  https://www.youtube.com/watch?v=QtMTvsi-4Hw&ab_channel=SteveMould
- **WiFi sensing for health applications**
  https://www.youtube.com/watch?v=CzAWndQh6xE&ab_channel=WorldEconomicForum

Why Final Project?



Bloom's Taxonomy

- Cognitive (knowledge-based)

Project Ideas

- Use USRP to receive/generate signals
  - Receive Wi-Fi signals, FM radio, GNSS signals
  - Generate radar chirp signal, LoRa, OTFS, …
- Use USRP for applications
  - Respiration sensing, localization, and speed estimates by Doppler effect…
- Use USRP to explore course subjects further
  - Error correction code, RX combining, TX beamforming, MIMO transmissions, …
- Protocol aspects
  - Wi-Fi contention, cross-layer effect of TCP traffic & Wi-Fi
- Other communications topics
  - Visible light communication, acoustic communication, RFID, …
  - Quantum communication: Superdense Coding, Quantum Teleportation, BB84 Quantum Key Distribution

If you need to discuss, you are welcome to schedule a time with TAs & me!

Final Project Timeline

		Main Tasks
Week 11	Nov. 11 (today)	Final project announced
Week 12		Lab 5 Demo Lab 5 Make-up Demo - TA Session (Nov. 20)
Week 13	Nov. 25	Final Project Proposal
Week 14		
Week 15		
Week 16 (Final)		
Week 17	Dec. 23	Final Project Demo (Dec. 23) Final Report (Dec. 26)

Final Project Graded Items

Proposal (10%)

- 5-minute presentation
- 2-minutes QA/discussion

Presentation

- Selected topic
- Basic and stretch goals
- Target experiment or simulation
- Required equipment or resources

Demo (50%)

- 7-minute presentation
- 5-minute demo

*We will finish all presentations before proceeding to demos

Presentation

- Selected topic and goal
- Methodology
- Results
- Analysis

Demo

- Produce the results on site

**We will vote for the best demo!*

Written Report (40%)

- 2-page written report
- A link to your demo video
- Code

Final Project Grading Policy - 1

Proposal (10%)

- 5-minute presentation
- 2-minutes QA/discussion

Presentation

- Selected topic
- Basic and stretch goals
- Target experiment or simulation
- Required equipment or resources

	2	1	0
Selected topic	Converged & well-defined	Not totally converged	No convergence
Basic & stretch goals	Well-defined & scope reasonable	Need refinement	Significantly lacking
Target experiment or simulation	Well-defined & match the goals	Need refinement	Significantly lacking
Required equipment or resources	Provided		No mention

*Graded by lecturer & TAs together

Final Project Grading Policy - 2

Demo (50%)

- 7-minute presentation
- 5-minute demo

*We will finish all presentations before proceeding to demos

Presentation

- Selected topic and goal
- Methodology
- Results
- Analysis

Demo

- Produce the results on site

We will vote for the best demo!

	2	1	0
Topic & goal	Well-defined **&** Well-motivated	**Not** well-defined **or** **Not** well-motivated	**Not** well-defined **&** **Not** well-motivated
Methodology	Major procedures **&** metrics defined	**One** major procedure or metric is not well-defined	**Multiple** major procedures or metrics are not well-defined
Results	Suitable data representation (e.g., line, bar, scatter plots)	Data representation can be improved	Not consistent with the goal & methodology
Analysis	Deep understanding of the results and their implications	Provide at least one insight	No analysis on results
Demo	All major components successfully demonstrated	One major component is not demonstrated	More than major component are not demonstrated

*Graded by lecturer & TAs together

Final Project Grading Policy - 3

Written Report (40%)

- 2-page written report
- A link to your demo video
- Code

	2	1	0
Effort	使用多少 existing package, 若使用其他課或專題已有的 code，哪部分是新加？		
Methodology	參數的選擇、畫什麼圖來驗證、選擇什麼 metric，做多少次實驗，怎麼控制 SNR，結論和目的有環環相扣		
Insight	Deep understanding of the results and their implications		
Lasting impact	Contributions to Comm Lab course development, e.g., future lab modules		
Written report	-----	Submitted	No submission
Demo video	-----	Submitted	No submission
Code	-----	Submitted	No submission

*Graded by lecturer & TAs together

Some Announcements

- Final Project Demo Time
  - Dec. 23, 2025 (Tue)
  - 10 am - 12 pm (Not 10:20 am – 12:10 pm)

- Please come to class in the final project weeks
  - Let the instructor and TAs know your progress
  - 不會點名，但是…

Paper Debate

Debate Format

20 minutes	Defense Team
10 minutes	Offense Team
5 minutes	Preparation time
10 minutes	Follow up arguments
5 minutes	Questions and comments from class

Timing will be strictly enforced!

Paper 4: Commercial RFIDs as Reconfigurable Intelligent Surfaces

https://forms.gle/aZegMvG7mij1YKK58

Only the audience vote!

Presenters: Upload your slides
(With 分工表)