

吳克弈/輔仁大學物理學系光電物理組大四

首先，非常感謝王秩秋老師，涂倉瑋學長，許朝雄學長這兩個月的引導和照顧，讓我有機會到美國實習兩個月，而且受益良多。

這兩個月，第一個學到的就是資料處理。朝雄學長跟我說過一句話，你來 MRI 實驗室，不會操作 MRI 或者不懂原理都沒關係，但你一定要會 fit data！於是在學長的建議下開始學習使用 MATLAB 程式來做 data 的處理。同時也利用做圖來讓自己更深入了解 MRI 的原理。相比去年，MRI 的原理了解得更透徹，更仔細。而且不光 MRI，還有許許多多 MRI 的一些小零件，Bruker 系統的優勢和缺點，平常做實驗會遇到的問題等等。另外也密集參與跟兒童醫院的合作，從一開始和那邊的醫生討論，到實驗，最後實驗數據出來後的討論分析。中間當然也遇到很多問題。以前總是聽別人說做實驗就是一直解決問題，所以要培養解決問題的能力。我想這兩個月跟著這個實驗，就是實際培養解決問題的能力，不再只是說說。遇到問題和學長們討論解決方法也是很有趣，總是會有腦力激盪，一次比一次有更好的方法，更創新的 idea。再來就是我們做的小專題，machine learning。涂倉瑋學長提出他以前做的研究，有了一個想法，簡單來說就是訓練電腦來判斷一張圖裡面哪些是我們要的細胞。研究過程中我們特別去 NIH 找學長以前的同事們討論。當中我最深刻的是，某個資工背景的學長說，也許對我們來說生物的那些 feature 是重要的，但以我們的角度來看，其實這件事只要交給電腦就好了。我其實一直都知道做 MRI 是一個跨領域的工作，也知道常常需要搭起個領域的橋樑，在那天討論的時候，我終於瞭解所謂兩個領域在合作時需要的橋樑就是這樣。

記得剛來的時候，王秩秋老師帶著我去某間大學找英文課，因為要等一個小時後負責人才會來上班，老師先回實驗室，跟我說等他來了之後你自己進去跟他報名註冊。當時我超級緊張，雖然從小到大都在學英文，也來過美國，但從來沒有要自己面對這麼重要的事情過，很怕出了什麼差錯。最後給了自己兩巴掌我硬著頭皮走進去，跟負責人講了一下我的狀況。雖然他說我找的英文課因為人數不足沒有開課，但是她說我的英文聽起來很不錯，覺得我甚至不需要上這門課。雖然我的英文並沒有因為那次對話有明顯進步，但卻因為他這樣說，我開始有勇氣在美國到處跟人溝通交流，甚至我的室友和另一個實習生以為我是在美國長大的。可能對很多

人來說這只是小事，但是對我來說，我覺得我自己像是跨出了一大步，現在回去看，真的覺得跟別人用英文溝通真的只是小事。

因為自己未來想做放射師，有一天約了馬復華學長。學長在美國是做放射師的，跟我談了美國這個行業的優缺點，雖然這好像沒什麼，但卻更讓我確定我想做什麼，我現在應該做什麼。我想比起很多同年紀的同學，這已經讓我有比別人有更多勇氣往前衝。

這兩個月的經驗和見聞，我想足夠改變我的一生了。這兩個月雖然也很辛苦，但是看見別人還在玩樂放鬆，我知道這樣的經驗可以讓我爬得更高更遠，讓我跟別人更不一樣，也是一個自我成長的過程。目標夠遠，才能走得更遠。這兩個月，學到很多，成長很多，也要謝謝很多人。我永遠都不會忘記這兩個月美國實習的。

Reflections of My Summer Internship in America

Eric Wu, Senior/Physics Department

First of all, I want to thank Drs. Paul Wang, William Tu, and Chao Hsuing Hsu. Without their help, I wouldn't have learned so much.

The first thing I learned here was fitting data. Chao Hsuing said "when you work in the MRI laboratory, that's fine if you don't understand the principle of MRI or don't know how to operate the MRI machine. But you have to know how to fit data!" So I started to learn fitting data by using MATLAB. With the MATLAB graphic skill, I learned the principle of MRI deeper than last year. Not only did I learn how MRI works but also about MRI's equipment, Bruker's system, and the problems that we will face during experiments. In addition, we have cooperated with the National Children's Hospital. In that instance, we discussed with doctor Joseph Scafidi, conducting experiments, and analyzing data. In Taiwan, people frequently talked about problem-solving ability. I think learning from case is the best way to get this ability. It's true that we faced many problems when doing experiments, but the most interesting thing was the process of discussing solutions. When we discussed about the problem, there are new ideas come out. Last but not least, I have a small project, which is called machine learning. To be concise, William and I tend to teach computer how to calculate how many cells are at a picture. For this, we went to NIH to ask people who were William's colleagues for help. What is really impressing is that one of William's colleague said: "Maybe the cell's features are important for you, but in my point of view, it's only one part of machine learning, just let the computer do that." I know MRI research needs people from different majors working together, and we need to build a bridge between different majors to communicate. This was it, I finally experienced an example of such a bridge.

Because I want to be a medical physicist tin the future, I met Dr. Ma, who has been a medical physicist in the United States for more than 20 years. He told me about the advantages and disadvantages of this job. That may sound like nothing to others, but it meant much to me. I now realize what I should do, and how much I love this job. Since I already have a plan about my future, I think I already being better than my other peers.

I remember one time, Dr. Paul Wang took me to a college to find an English class. Because I have to wait an hour until the manager come. Paul said, "I have to go back to laboratory, you wait in here and talk to the manager, OK?" I was so nervous, even though I have learned English for a long time, I never do such a serious thing by myself. An hour later, I slapped myself and went in. I told manager my situation. Though the class I was looking for would be cancel, but the manager told me my English is good. My English didn't get much better after that conversation, however I'm not afraid of speaking any more. I started to have chat with someone. Seem like a negligible thing, but it's really arduous for me, and after that I found I have grown up a lot. In addition, my roommate and other interns thought I grew up in America.

What I learned and saw during these two months changed my life. Though these two months were difficult, when I saw my classmates playing somewhere during this summer, I know I can be more successful than they. I want to thank everyone who helped me during this time, I won't forget that.