Doing a (Computer Science) PhD in the United States (as a Dutchman)

Okke Schrijvers
okkes@cs.stanford.edu

September 30, 2014

So you are thinking about doing a PhD, possibly in the United States. If you've managed to find this document, I'm quite confident that this much is true. Now there are a number of other qualities that you, the reader, might possess: if you are lucky then your field of interest is related to Computer Science and you are not actually from the US, possibly even from the Netherlands. If these qualities make you lucky in the game of life is up for debate, but this document might just be perfectly tailored to you!

Contents

1 Introduction

Before diving into the main body of this text; allow me to introduce myself. I am a Dutch citizen who did his undergrad in Computer Science (CS) at Hanzehogeschool Groningen; I worked in the video game industry for about 2 years before I realized that I liked learning more than programming. I decided to quit my job and applied to the CS Master's program at TU Eindhoven. During this, I felt drawn to pursuing an academic career and I was particularly interested in doing a PhD abroad; preferably in the United States. Since September 2012 I've been a PhD student at Stanford, which is on the west coast of the United States.

I found the process of getting a PhD position in the United States to be an overwhelming experience, with very little information available to me. Throughout the application process I have gathered many resources that helped me, and I've developed a decent acumen for creating a good application. At Stanford I have also helped out on the CS PhD admissions committee, for which I read through many applications to identify which students would be considered for admission. This has given me a good sense for the qualities of a good application, and I'm writing this document to help potential applicants; both by demystifying the process, as well as an idea which aspects to focus on for the best results. While there are many resources available that guide you through the process, I found it hard to evaluate the advice with the perspective of a student at a Dutch university; since there are many differences between the American and Dutch education systems, some advice or assumptions are simply not applicable to your particular situation. The goal of this document is to give a better insight for Dutch students (in CS or other related technical fiels) that are looking for a PhD position in the US; students with a different background may still find the information valuable, but they should be aware of the same predicament that necessitates this document in the first place.

I want to convey information about the entire process of applying for a PhD, but realize that this is heavily biased towards my own experience. Although many parts may be similar for different research fields, I cannot make any claims about the accuracy of what I write. There might even be notable differences between the schools that I have applied to, and schools that you might be interested in, so please forgive my small sample size in constructing this document and take my advice with healthy skepticism. I try to ameliorate this by listing several other resources at the end of this document, but I strongly encourage you to find your own as well.

Eventually, this document will hopefully shed light on the entire process –from reasons to do a PhD (in the US), to getting your visa– but the bulk of the information will be on the admissions package that applicants have to send to universities. This document is still under development, and you can find the latest version on `www.okke.info`. You can help improve it by sending feedback to me at the e-mail address listed on the first page.

2 Myths

Before talking about the application process, I feel the need to address a number of protestations that I invariable hear from people that are interested in going to the US for a PhD program. I call these the "myths" that Dutch students believe in, and these are probably where most of the interested students drop out. Let's see if I can bust some of these myths for you.

I can never get into one of the top institutions in the US. I'm not smart enough.
Top institutions in the US are very selective, but there are plenty of opportunities for highly-motivated Dutch students to get in. It is not a matter of being smart and coasting through your education. I went to HAVO, then HBO and finally did a Master's in Eindhoven. The average university in the Netherlands is far superior to your average college in the US. On top of that, Dutch students would only consider doing a PhD after a Master's, contrary to their American peers, who do this after their Bachelor's degree. Compared to international applicants, the Dutch are probably among the ones with the best command of English, again giving them an edge. This combined, puts Dutch students in a great position for a grad school application at a top US institute.

I need extremely good grades to get into a PhD program.

You are not going to be taking a lot of classes when you are doing a PhD. The university will not admit you, solely on your ability to perform well on tests; they are looking for candidates that show promise in research. Creative people that come up with novel approaches to tackle problems are far more likely to succeed in a PhD program than students who are great at learning how to pass tests [1, §3.1]. Having said that, have low grades might be an indication to an hard-to-motivate personality and this might be a disadvantage when you apply.

The PhD program is way too expensive. I could never afford it.
Undergraduate (Bachelor) studies in the US are prohibitively expensive ($50,000 per year is not an exception). However, if you are doing a PhD, especially in CS or other STEM[1] field, it is highly likely that you will not pay tuition, and you will receive a stipend (a sort of salary) that is enough to support all of your living expenses. Even if universities do not advertise this, typically students are financially supported [1, §2.5][2, 3], so money should not be a consideration.

The admissions process is way to involved and the chance of getting in too small. It's too much work for something that may very well not yield any results.
There is no way around it, this is quite true. American top programs are very competitive and you may end up applying to a number of them and not get in. This seems very strange from a Dutch perspective, but realize that anyone and everyone who would want to go to an American top institute has to go through this. It doesn't matter if you're from the Netherlands, the US, China, India or Zimbabwe, each and every student that gets accepted had to go through the same process. So instead of seeing this as a problem, you should see this as an opportunity. In the unforgettable words of Randy Pausch[4]: *"The brick walls are there for a reason. The brick walls are not there to keep us out. The brick walls are there to give us a chance to show how badly we want something. Because the brick walls are there to stop the people who don't want it badly enough. They're there to stop the other people."*

I have to do American standardized tests. There is no way I can compete with Americans.
This preconception is particularly funny. Of the many Americans that I have talked to, a lot of them scored worse than I did on these tests (and I did not score excessively high). The reason for this is that they are more aware than foreigners that these standardized tests[2] are not that important for a PhD position [1, §3.2]. The far more important factors are your motivation, research that you might have done, and the recommendations from professors.

Author's note: do you have a great excuse why you really want to do a PhD in the US, but can't because of some reason, let me know (e-mail address is at the top of this document) and I might end up adding it to this list :).

3 Differences between Dutch and US PhD Programs

American universities typically have a good name, but there are a few structural differences between PhD programs on different sides of the ocean.

The Netherlands (and most of Europe) have *project*-based PhDs. This means that you apply for a particular project with a particular professor. In the United States you apply for a PhD *program*, meaning that the department (not professor) admits you, and the start of your PhD revolves around finding an advisor and project to work on. This leads to some cultural differences.

In the Netherlands, funding has typically already been procured for the project you work on. There is enough for your salary for 4 years, and you will probably have to supplement it with working as a TA (teachers assistant) for your full pay check. In the US, funding either comes

[1] STEM stands for Science, Technology, Engineering and Math

[2] There are two major standardized tests that you will likely have to deal with: the GREs, for grad school admission, and the TOEFL, for command of the English language

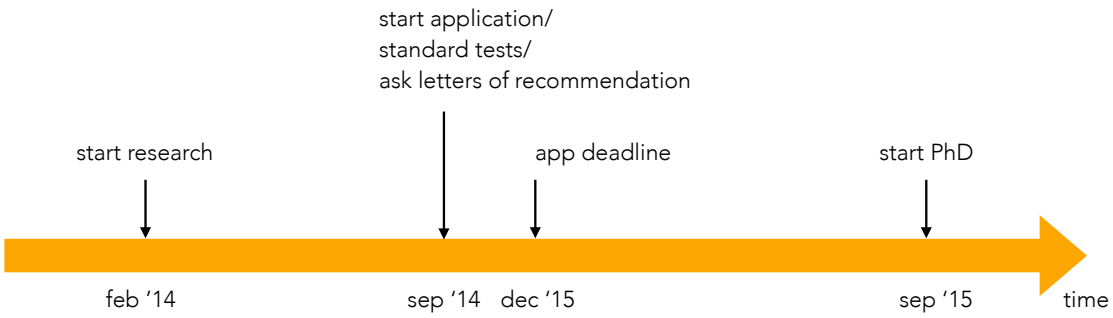

Figure 1: An approximate timeline for your PhD application.

through an external fellowship[3] or from the department. This gives you more flexibility than you would usually get in the Netherlands. You'll often have to option to switch research field and/or advisor if it doesn't work out. Additionally, you will typically spend less time as a TA and more time on research; although your mileage may vary per university.

One downside to doing a PhD in the US is that it is often assumed that students haven't done a Master's program. This might mean that there are some mandatory classes that cover material that is similar to what you might already have done. Often enough Dutch universities are not on a fast-track list to get courses waived since professors don't know the quality of courses in the Netherlands.

4 General Timeline

For the students that look past the myths from the Section 2, a lot drop out when they realize how different the timeline is for the application process: many are already too late to apply.. Typically you can only start in September (start of the academic year[4]) and you should start working on your application a full year before you intent to start, see Figure 1. The purpose of your application is to convince the admissions committee that your capable and interested in doing good research, so it is extremely highly recommended to have some sort of research experience before applying; if nothing else, this will be the best way to get good recommendation letters. Since the application deadline is so early, you cannot rely on using your Final Project for this, and you'll want to account for another 6 months to get the appropriate experience.

5 Picking Universities to Apply to

If you've made the decision to pursue a PhD position, one of the most important choices you'll initially make is which universities you want to apply to. Every application requires a decent amount of time, particularly since you'll want to adapt all material to each individual university. Additionally, universities typically require a payment between of anywhere between $50 and $150 per application, so it can be a costly endeavor to apply to too many programs. As a frame of reference, I applied to 6 universities which is considered slightly high. My advice would be to try about 5 schools, but only if you would be excited to go to each of those schools in isolation. Advice that is often given, is to apply at least to 1 or 2 *reach* schools (these are schools that you don't expect to get in, but you potentially could) and 1 or 2 *safety* schools (where you feel that you probably should get in). This advice is also often given to undergraduate applicants [5].

The following tips could help you to determine the schools that you want to apply to:

[3]This is often "free money", you get it just for your potential, your background, the research area you work in, or a combination of all of them.

[4]This is an artifact of *program*-based PhDs.

- Look at the papers that you find interesting, and find write down the universities of the authors. Find out which of the authors are the professors and which are students. Find out where the professors currently work. As an example, I was really interested in the work done by the ETH Zurich group on fluid simulation but by the time I was looking at universities the group had all but disappeared.
- If you've done research with professors and liked the research they were interested in; ask them what universities they think would be good. In addition, they might know people there so their letter of recommendation may hold extra weight. Be wary of your professors *under*estimating you potential when they recommend schools. Dutch students aren't the only ones who belief the myths in Section 2! Ask them what they think the best programs are, and consider those as reach schools.
- You might check the h-index [6] of professors as a proxy to see how influential they are. There are lists for different fields, the one for CS can be found at [7]. Don't focus too much on this ranking though: a good researcher is not necessarily a good advisor, and even a good advisor is not necessarily the right advisor for *you*.
- As another proxy, you can look at different rankings of schools. There are a number of standard ones, like the Times Higher Education [8], US News rankings [9], Shanghai Rankings [10]. Do realize that these scores are highly subjective and are not necessarily indicative of a good PhD experience.
- In general for Computer Science these three universities score consistently high on rankings: MIT, University of California Berkeley, and Stanford.

6 Admissions Process

Great! You've decided on which you will apply to. Take a moment of reflection with your favorite beverage, because the next step will be the big one. Each university will have a list of requirements for an application, like this one from Stanford CS [11]. If you haven't found the list yet, you can typically find it with a google query like "*school name program* PhD admission requirements". A lot of the requirements will overlap, but some schools will have unique requirements. Compile a list of all requirements and let the fun begin! I've listed the most common requirements below. Some universities will require you to send a physical copy of some of the documents. Make sure you send this with certified mail and tracking. While universities could make exceptions for students they are particularly interested in, you might not want the postal service to mess up your application!

6.1 Statement of Purpose

Your statement of purpose is an essay of about 1-2 pages in which you have the opportunity to frame everything you've done so far in a consistent narrative about what you want to achieve in life and what you want to get out of your PhD experience. This is the only place where you have the opportunity to explain your rationale and motivation behind the choices you've made, and if done correctly can be the back bone of your entire application. It was for me; the professor who admitted me told me that it was my Statement of Purpose that convinced him, and that's why he pulled me in. The importance of the Statement of Purpose differs per professors though, with some really only looking at the letters of recommendation.

I cannot give you a complete description on how to write a Statement of Purpose, but you can follow the tips from [1, §3.3] as a rough guideline. In my SoP I incorporated my time in the industry as a strength that showed me how much I like research. Standard practices for writing a narrative apply, like starting out with a list of points you want to make, and writing several drafts with different structures before commiting to the final version.

One final tip I can give is that it helps to name the professors that you would like to work with. It is very likely that if you name a professor, she will review your application personally

since it will be likely that you will want to work with her. By not naming anyone, you will be reviewed by someone who might not have an interest in fighting for you. Since PhD positions are really competitive, it cannot hurt to have a professor fighting for your admission.

6.2 Letters of Recommendation

Typically, a school wants 3 letters of recommendation either from professors, or otherwise people who can attest to your research skills (your classmates unfortunately do not meet this requirement). Getting into a PhD program is dependent on your ability to do research. In 99% of all situations, any research that you'll do prior to grad school (and during grad school for all that matters) is under supervision of a professor. This means that your letters of recommendation can weigh very heavily in a decision for admission.

The most important things is that all of your letter are strong: a letter that is written by someone who is not fully convinced that you'd be a good fit, may end up hurting more than helping. Therefore, when asking a professor for a letter of recommendation, don't ask them if they could write you a letter of recommendation; ask them if they could write you a *strong* LoR. This give them an easy way out if they don't have that much interaction with you. Having 2 letters instead of 3 is better than having 2 strong letters and a weak one. Point them to this website [12] by a Brown professor about writing strong letters of recommendation: it's a great insight into the expectation of LoRs in the US.

I opted to ask both well-known professors that I've worked with on a research project, as well as lesser-known professors that I've worked with closely over an extended period of time. Well-known professors add weight to your application, whereas people you've worked with closely can unique qualities better than anyone else. Don't make the mistake of asking famous professors from whom you have taken a class: letters about coursework do not add any value to your application. Finally, if you refer to research anywhere in your application (in your SoP, on your website, or if you have a publication) make sure that you get a LoR from your advisor on that project!

If you are still far away from actually applying, you might actually start to plan out who you would prefer to have written your letters. You might ask them if you can do research with them, either as part of a class, or on top of your workload. This is quite a lot of extra work, but it definitely pays off. Added benefit is that it might lead to a final project (Bachelor's/Master's project) where you already know all the background. DO NOT wait for your final project to work with the professors, because you will be too late for your applications.

6.3 Resume

Your resume, also known as CV (curriculum vitae), is supposed to give a clear and accessible overview of your accomplishments. While some things carry over from an industry resume, the goal is convey your academic prowess, not your industry skills. There are plenty of online resources that talk about the content of your resume.

I found that the following basic rule goes a long way to creating a good (academic) resume: Every line in your resume should be another reason for the person looking at it to admit/hire you. Do not put your job at Albert Heijn[5] on your resume, unless you were in an important managerial position. Your paper route is also not going to do you any favors. While listing *all* you past jobs is classic advice on most resume sites, realize that this advice is written to be generally applicable in most situations. Applying to one of the top-tier programs in the world, is far from the average use-case, and this advice is not very helpful is this case.

My contents on my resume in order of appearance: Personalia (actually not that important), education (quite important, add extra curricular activities), honors and awards (thesis awards, thesis nominations, honors programs, misc), work experience/employment, publications (if you have any, great! If not, don't worry there are plenty of people that get in without any publications), any thing you want to share (for me: published games, conferences attended, reviewer at

[5]For the non-Dutchies it's a grocery store.

conferences, teaching experience, extracurricular activities (again), references, and finally languages). Whilst I will not claim that my resume is perfect, you could use it as inspiration. The latest version is available on my website: `http://www.okke.info`.

Some of the other things to realize: Everyone is going to have a degree with high grades, that will not set you a apart. Being the president of your study association will. Doing public service in the US is far more important that in the Netherlands. If you haven't done already, you could for instance take a position with your study association, or maintain the website for your soccer team. If your school has an honors program, it's a great way of doing research, and buff up your resume at the same time.

6.4 Degrees and Transcripts

Your degrees (diplomas) and transcripts (grades list) are not something where you have a lot of freedom to express yourself, but they will prove to be a time sink. Universities typically want English versions of all your post-high school degrees and transcripts. Some want official copy at the time of application, while others allow you to upload a copy and send official copies if you accept their offer.

Find out how you can get official copies of your degrees and transcripts in advance. Send an e-mail to your university, or walk past the admin office. Usually you can copy your degrees and send them to get them signed and certified. Get them, scan them at decent resolution and upload or send them. If you do have to send them, make sure you send them with certified mail. The mail will take about 2 weeks, so start well in advance.

If your degrees and transcripts are in Dutch (as mine were), than you might need to get an official translation when you apply. Some universities require an official translation upon application, some upon acceptance. If none of them require it upon application, translate it yourself to save a ton of money (at least initially). Between the US and the Netherlands there are treaties as to what is accepted as an official translation, so this should be fairly straightforward. I spend about 200 euros and I got 2 certified copies and an uncertified copy. Note that if you only get your degrees in Dutch, you will need to send both the certified documents in Dutch, as well as certified translations on the certified Dutch documents in English.

Depending on how fast you can get official copies from your university, this process can take quite long. Start working on with at least 4 weeks to spare to make sure the universities get your material in time.

6.5 GREs

The graduate record examinations (GREs) is a standardized test that is used by most universities for admission to grad school. It consists of three parts: "Quantative Reasoning", "Verbal Reasoning" and "Analytical Writing". The first one is a math part that is not much harder than what you learn in high school. The second and third part are language tests, which are harder for foreigners. Don't worry though, with a little bit of preparation you can make sure that this is not going to make a dent in your records.

The best advice I can give about the GREs, is that you should prepare enough to not tank them. It is a standardized test, and there are plenty of prep books available to you. If your university library does not have one, I would suggest that you buy one online. The cost of a text book (about $30, including shipping) is low enough in comparison to the test (between $130 and $210 plus a premium of $25 for each school after the first four) and it will significantly improve your score. If you applying in CS, or a similarly math-related field it is definitely possible to score perfectly on the math part. Both language parts will be hard to score great on, but preparation is half the work and universities will be lenient to international students on this.

Your score on the GRE is in a way similar to your grades. It will never be the most important reason they accept you, but particularly low scores might harm you. For a technical program, universities will not care about the analytical writing and verbal reasoning so much, but they will expect high scores on quantitative reasoning. The official website is `http://www.ets.org/gre`,

and make sure to register early because there may not be many test dates available in the Netherlands.

Note: for Computer Science, some schools also accept the GRE subject test. I haven't taken this, nor do I know of anyone who has. Since you will never be admitted solely on a standardizes test score, but it can hurt your application if it's really low, you would be better off investing your time in something else. In other fields like mathematics, the subject test is an important part of the application requirements, and a low score could mean that you're denied admission.

6.6 TOEFL

This is a mandatory part for most foreigners at most universities, although some will accept other tests. If you've determined which universities you will apply to, make sure that none of them require you to take another test as opposed to the TOEFL.

Preparing for the GREs will prepare you sufficiently for taking the TOEFL test. However, do take the time to familiarize yourself with the format of the test, so you know what to expect. Do not spend any money on getting "certified" prep material, but you can use some of the free materials on the official website. If your English is good enough to write a Statement of Purpose, it is good enough to pass the TOEFL.

You should not stress about the TOEFL, but do realize that it is usually mandatory, so register early and take the test with lots of time to spare. The official website is `http://www.ets.org/toefl`.

6.7 Miscellaneous

Consider creating a website to promote your application. List any publications if you have them, and provide links to an electronic version (while most professors have access to sites with a paywall, they might check at home, so supply your own generally accessible pdf if possible). Especially when your starting out, it can help to put some papers on there that you've written for classes, and perhaps some projects that you are proud of. Your website is supposed to show that you are excited about your work. Again you can check my website `www.okke.info` as an example.

It is very common practise to also list paper that are in preparation. Make sure to clearly identify these, though and don't play it off as if they've already been accepted!

Consider the possibility that people will search for you online. This can include a basic Google search (you can check what they will see by browsing in private mode on your favorite browser), or a Facebook search. What you want to show of yourself online is up to you, but at least be aware that anything that is public, may be accessible by universities that you apply to. Related to this is that you might consider updating your LinkedIn profile to match your current interests.

7 What are my odds of getting in?

This is the most important question of course, but also the most difficult one to answer. The main thing that universities are looking for something that stands out positively. When I initially applied, I feared that I might get pruned from the list at an early stage for my worst part of the application. As it turns out, most universities do not operate in that way.

Remark: I wrote the following paragraph prior to my involvement in Stanford's CS PhD admissions committee. Rather than editing this based on my experience, I've decided to include it verbatim. While I don't have first-hand experience with the admissions process, I've heard that each application is reviewed by administrative staff, who look for anything that stands out positively. If you have a publication, perfect, you're going on the "further review" pile. If you received a national award, great, you're on there as well. Only applications where nothing stands out (e.g. good grades, good GRE scores, little research, no website, good statement of purpose, mediocre letters of recommendation, you get the gist) are tossed out immediately. The purpose of this filtering is to weed out the applications that are in no way remarkable. The

precise definition of remarkable of course depends on the university, but in general, universities rather waste 10 hours on an applicant that might not make the cut, than to lose an applicant that could do great research. Therefore, even if you don't score strongly on all accounts, you still have every opportunity to be reviewed by the professor you want to work with. That's another reason why it's important to name the professors that you would like to work with. They are the best judge of whether or not you would fit in their group, so make sure they will receive your application.

Beyond that, I cannot tell you what your odds are of getting in. Good universities often extend offers to less than 10% of their applicants, but it's hard to estimate how many of the original pool are serious applications. I applied to 6 schools: 2 safety schools, 2 match schools and 2 reach schools. I got into both my match schools, and I was rejected by 1 of my reach schools and 1 of my safety schools. At the end of the day, there are many factors that come into play, and I only have so much anecdotal evidence to go on[6].

8 Choosing a School

If you get accepted by universities, you will generally hear about it somewhere between the very end of January and halfway through February. If you haven't heard back from a university by the start of March, you may assume that you are on the wait list of applicants that might get an offer if others decline.

Universities will have visit days some time after the start of March, and students can typically get anywhere between $300 and $800 reimbursed for this. While it may cost a lot to fly to the US for a single university, if you get into multiple, you can combine your reimbursements and get a good impression before committing.

I really recommend going to the visit days. Not only are they a lot of fun[7], and you get to meet a lot of very interesting people, you will also get the most accurate impression you can get before actually commiting to the university. If the visit days of different universities are spread too far apart, you can often talk to the professor who contacted you and visit some other days. While you lose the benefit of all the organised events, you will still get a decent feeling for the atmosphere of an institution. Usually, they will still reimburse you for your travels.

After the visit days, you will have to decide before halfway through April where you feel most at home. A PhD program takes a long time, if you don't feel comfortable at a university, you will not have a good time. So in addition to looking at the opportunities that a university and research group have to offer, try and see yourself living there for 4-6 years.

9 Moving

Pfew, I feel that we have covered a lot of ground. From now on, it's just administrative stuff. Since that is still a long time from the time that I'm writing this, I'm punting that one for now and live to write another day.

10 Resources

As a researcher (to be) you know that you should never get all your info from just one source. But that doesn't mean that I can't help get you started with some class A resources.

The best resources that I've found are the inside-knowledge ones of people who have served on admissions committees. One of these, that I've heavily used, is the "gradschooltalk" pdf [1] by Mor Harchol-Balter who served on the PhD admission boards at CMU, Berkeley and MIT. With Stanford, these 3 schools usually lead the rankings of CS grad schools. Lots of solid advice on all of the parts of the application package, as well as tips on where to focus your energy and

[6] On that note, if you apply to schools, and get in, or not, I would be happy to hear about your experiences so I can update this document.

[7] Full disclosure, I've been a student co-chair for organizing Stanford CS's PhD Admit Weekend.

contextual information. It is my impression that he over-emphasizes the financial aspect, but this may be because on this item specifically I only have experience with Stanford.

Another great resource is GradDecision [13] by Andrew Ng, Stanford professor, former chair of the Stanford CS PhD admission committee and one of Time magazine's most influential people in the world[14]. He addresses both MS and PhD and is in a far better position to tell you what universities look for than I am.

There are many more other resources that I could list, but since mine are skewed towards CS and Stanford, I figured that this would not necessarily be very helpful. Instead I would love to hear from you if there are great resources that provide an alternative view.

11 References

[1] Mor Harchol-Balter. Applying to Ph.D. programs in computer science, 2011. http://www.cs.cmu.edu/~harchol/gradschooltalk.pdf.

[2] Stanford University. http://cs.stanford.edu/content/faqs#e2.

[3] Cornell University. https://www.cs.cornell.edu/phd/faq#funding.

[4] Randy Pausch. The last lecture - really achieving your childhood dreams, 2007. http://youtu.be/ji5_MqicxSo.

[5] The Princeton Review. Match, reach and safety schools. http://www.princetonreview.com/college/match-reach-safety.aspx.

[6] Wikipedia. h-index. http://en.wikipedia.org/wiki/H-index.

[7] Jens Palsberg. The h index for computer science. http://www.cs.ucla.edu/~palsberg/h-number.html.

[8] Times Higher Education. World university rankings. http://www.timeshighereducation.co.uk/.

[9] US News. Cs phd rankings. http://grad-schools.usnews.rankingsandreviews.com/best-graduate-schools/top-science-schools/computer-science-rankings.

[10] Shanghai Ranking. Computer science academic rankings. http://www.shanghairanking.com/SubjectCS2013.html.

[11] Stanford Computer Science. Checklist. http://cs.stanford.edu/content/checklist.

[12] Shriram Krishnamurthi. Advice to graduate school recommendation letter writers. http://cs.brown.edu/~sk/Memos/Grad-School-Recos/.

[13] Andrew Ng, Cindy Cheng, and Jay Tsai. Grad decision - helping you get into your dream school. http://graddecision.org/.

[14] Time. The 2013 time 100. http://time100.time.com/2013/04/18/time-100/slide/andrew-ng-and-daphne-koller/.

[15] Wikipedia. Education in the Netherlands. http://en.wikipedia.org/wiki/Education_in_the_Netherlands#Vwo.

[16] ETS. For institutions: How the GRE tests are scored. http://www.ets.org/gre/institutions/scores/how/.

[17] ETS. Automated scoring of writing quality. http://www.ets.org/research/topics/as_nlp/writing_quality/.

[18] MIT EECS. Faqs. http://www.eecs.mit.edu/academics-admissions/graduate-program/faqs#15.

[19] Wikipedia. Graduate record examinations – analytical writing section. http://en.wikipedia.org/wiki/Gre#Analytical_writing_section.

[20] New York Times. Facing a robo-grader? just keep obfuscating mellifluously. http://www.nytimes.com/2012/04/23/education/robo-readers-used-to-grade-test-essays.html?pagewanted=all.