

Applying to the U.S, from India, for Graduate studies in engineering

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Version 4.0, updated June 2004.

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What this guide is, and isn't.

The guide is not meant to be comprehensive. Does not promise all the answers.

Does give you the big picture. Brightness, contrast, and focus are left to you.

Although the guide should be beneficial to engineering students in general, it does have a focus on Electrical engineering, since that was what I did, and am closest to.¹

Intended Audience

Junta. People like you and me. From an engineering college, probably in 3rd or 4th year. Not from IIT, BITS, or Roorkee (their ball game is different). Hopefully a 65% on average till date, no drops, lots of hope, some money at home, and very importantly, *willing to run the extra mile, in every way.*

1 Understanding the Finances

Let's address some fundamental questions before proceeding.

Things you should know about funding

The question is, does funding exist? Of course it does! It's rare, but it works. You should at least know how it works when it does. This is probably the most important thing that students would like to know about before applying. Money. The root cause of all evil, before, and after admissions.

There are three sources of funding in U.S graduate schools :

1. Fellowships
2. Teaching Assistantships (TAs)
3. Research Assistantships (RAs)

We can safely ignore fellowships, as they are ordinarily given to the extra-ordinary. *Fellow* is a British term, by the way, and if you know what it means in England to be a fellow, you'd guess how 'Major' they are expecting you to be if they are likely to give you a fellowship. From India, a typical fellowship awardee is a Presidential Gold-medallist from the IIT, having achieved top academic honors since he could scribble the English or Mathematical alphabet.

Ok, other people also get fellowships, but they would've won a few terrible olympiads way back in school, or won major design contests like *Yantriki* - things you and I didn't ever care about ever. Ignore, and be happy. Look at the other two.

1.1 Teaching Assistantships

- At the time of admission, TAs are given usually on academic merit, as evaluated by the department. If you do not get a TA at this time, it becomes your responsibility to try and procure it by pursuing a Prof who teaches the kind of courses you are strong at. All your friends who did manage TAs (vow) got them after pestering around *after* reaching there.
- Nowadays, given the paucity in funding, PhD students are given preference for TA positions, and only then are the 'I want to do only Masters' students given a chance.

¹If you are from a non-EE, non-CS background, and would like to pitch-in about your applying experience, please do write to me at uday.arya@gmail.com, I'll do what I can to incorporate it, either directly into this guide, or as a separate document. Your inputs might be valuable for many people new to the entire process.

- They have, as a rule of thumb, abolished the practice of giving money to the non-elitist category (us). [depressing]

So what is a TA ? Its a form of aid, for a return. You do work for them, such as grading term papers, taking the end-semester classes for a professor, sometimes in charge of lab sessions etc.

Most people have to prove the entire funds, go there and *then* try and get a TA. Sadly, that's the best it gets.

1.2 Research Assistantships

RAs - are your next best bet for funding. If it happens, good for you. If you are applying to a school (their term for college or department..), it should in part be because you have professors teaching there approximately in your area of specialization. If they see you as potential assistants to their research work, you may get selected. If you're still luckier, you may even get funded immediately. Mostly, they'd like to see you 'perform', and then give you the money. The catch is whereas the TA money comes from the department, or university, the RA money comes from the Prof. Yes, good Profs work hard to get funding from external agencies. They get substantial amounts from the industry to achieve specific research targets. If you get an RA, your stipend is actually coming from his/her pocket. You'll have to prove, of course, that you'll make a good assistant - typical skills for EE students include good programming *experience* in C/C++/MATLAB/VHDL, or other discipline-specific experiences or courses. If you are applying for a Ph.D, this is the first form of aid you'll be considered for (and given). For a Master's, however, it'll be a lot more difficult - there is just too much competition. The ray of hope is that if you aren't persuasive enough on paper or email, you can get an RA or part-RA once you get there and pester hard enough. I know this only because some of my seniors have got money this way. It does happen. But there aren't any guarantees. If you [(have a huge ego) AND (mind getting kicked about)] OR aren't persistent enough, don't complain if you don't get money. But there is hope for aid - thousands of Indians go every year. All are not sons or daughters of 'big' people. Keep smiling.

1.3 How much money do each of these things mean ?

- Fellowships offset the entire costs of education - tuition, living, food - everything. It is tuition paid for + a stipend, involves no teaching duties, nor specific work required by your professor/lab. You're a student 'extra-ordinaire' !
- Getting a TA or an RA implies one good thing normally - your tuition is waived. Note however, that the waiver lasts for as long as you have that assistantship.
- Besides the tuition waiver associated with a TA or an RA, you are usually given a monthly stipend, which though from their point of view is rather paltry, more than suffices for most Indian students.

1.4 How much money does one need ?

- Lots. The application procedure will set you back by anywhere from Rs. 35K to 50K.
- Unfortunately, there a lot of things you'd need to look at well in advance of the process.
- Lets look at it in the logical stages you will face
 - At the time of applying
 - When you go for your Visa

1.4.1 At the time of applying

Universities (also referred to as 'schools' henceforth) usually ask students to evince support to the extent of the entire first year costs. This is anything from \$20k to \$47k. There are some things you ought to know, things that for instance, took me a long time to understand.

Universities don't understand the term 'Chartered Accountant'. The consulate does, and needs a CA certificate, but universities don't.

Universities need bank letters, typically a letter from a national bank.

There are two kinds of bank statements people prepare.

Solvency certificates are the norm, and most bank officials dealing with students intending to go abroad will tell you that they have issued such certificates. I got my certificate issued too - and called it a 'Capability Certificate'. It is printed on the bank letter head, titled appropriately, dated, and says :

"This is to certify that Mr. A x and Mrs. B x, residing at (your residential address), parents and sponsors of Mr. C x (you), are our valued customers maintaining Savings Bank Acct No. 12345. They are solvent to the extent of Rs. _____ which is approximately equivalent to USD _____ as per the assets and liabilities statement available with our branch."

So if you have a property which is not mortgaged or is not 'stuck' somewhere, you can use it. Ideally, you should get it valued, by a professional evaluator, get that valuation statement, and go to the bank which you have been maintaining a Savings account.

The other kind of 'Bank statement' is a Snap-shot of your Savings Bank Acct. People pump in money into their S.B.Acct from various sources (for ex: if they don't have a property or its tied up somewhere) They pump in enough to exceed 1 year costs by 10-15%. If you need help in these matters, and friends of your family can't pitch in, there are professional agents to help you with these matters. Try Visu Consultants, they help with all matters, and have been doing so for years. Finally, remember that you'll be getting precisely *one* bank statement from your bank. To send it to many colleges, get it notarized nicely, so it looks authentic.

Suit yourself with what kind of statement you want to prepare.

Now, what happens at this stage is that, assuming you have been admitted, the univ will be in a position to issue you an I-20, with which you go marching to the consulate.

1.4.2 How Financing works at the Consulate

It works very differently. For a start, you can take your solvency certificate and put it in a bin, it won't be an acceptable document. Also understand that if you used the other option of creating a huge amount in your savings account, you'd be better not show that at the consulate. You may not have large amounts sitting in your S.B.Acct - and they know that. Money idles if its left in a S.B.Acct. You show big amounts in it, and they'd ask you for a **run** of that account {Yes, I know of people who've actually been asked to provide a run on that bank account} - from the run they make out when you actually 'pumped in' the money. Definite case for a Visa reject. Beware of such pitfalls. Umpteen people have faltered with these things before us, so just keep them in mind.

What you will need is an exhaustive CA statement prepared for you.

The tough part is this :

It has an entry that says (on the first page) - "*Personal / Family savings from India*"

This amount should typically be 1 to 1.5 times the Total, as shown on the I-20.

Another thing I had a big issue was with the term *Savings* - what does it really mean. [I imagined it to mean, quite literally, the amount in your S.B.Acct {and that alone}]

An authoritative Visa consultant says this about '*Savings*' : It is any and the sum of the following. "S.B.Acct, Current Acct, F.D, NSC, NSS, UTI, IVP, KVP, Shares, Bonds, Stocks, Debentures, Mutual Funds, Investments in Private Limited companies, Post Office savings, P.F, or money in P.P.F" [To most people, this should be a breather]

Your primary homework before applying is this : See if you can cross the financial hurdles in stage 1 and 2. That is, see if your family is in a position to generate a 'Capability Certificate', and see

if your admission comes through, your Savings, as defined above, exceeds the 1-year costs of attendance. If either of these proves difficult, I'd say you have two last options :

Apply for a Ph.D and on the Financial statement required by the univ, say you have 0\$ from family contribution. Chances are, if they select you for a Ph.D (i.e you're an exceptional student), they'll be obliged to fund you.

If you're keen on the M.S only and are short of finances, be extremely cautious about applying itself. Funding, and the lack of it, at any stage, will hurt you.

1.5 Living Expenses - the essentials

For a start, know that American univs don't budget conservatively. They expect their students to stay in comfort, which is why you see those big numbers for living on your I-20 or the univ web-site. Some places, like Boston, are prohibitively expensive - you ought to know where it is expensive and where it isn't (to stay). The states of California, New York, Massachusetts, Pennsylvania and much of the east coast are v.expensive. Iowa, Utah, Colorado, Texas, esp Texas are, for example, much cheaper. A *median* budget would be around \$400-450 a month per student. Could drop more depending on state, company, and gender. No jokes, boys don't mind roughing it out together in slightly larger groups, averaging 3+. Girls do live in groups of 3-4 also, but its more rare. Whatever the amount for living expense is, it is possible to earn in a month, through the 20hrs/week allowed time. Of course its difficult, but there isn't any other choice. This is roughly how Indians manage their stay - by working part-time.

1.6 So there's no risk ?

There is - if even after 2 semesters you haven't quite procured funding (funding enough to offset your tuition), and home funds + bank loan money is running out, you might just have to return mid-way. Very difficult situation. That doesn't happen too often, thankfully, because we students do *something* to *somehow* manage, but it can get enormously strenuous. Keep these factors in mind before giving the go and applying.

1.7 Admissions Trends (or the lack thereof)

To many, distributions matter - where and how people make it becomes part of their 'statistic'. Here's my 'statistic' - add it, remove it, XOR it, whatever u want. Many branches of engineering in India converge to one, equivalent branch in the US. This is especially true of EE and CS. EE, or Electrical Engineering, in the US - includes all of the classic electrical engineering framework in India, the entire Electronics and Communication, Telecommunication, Instrumentation - they all, most often, apply for admission to the 'EE Dept' at univs. In CS too, people apply from Computer Science, Information science, and allied fields. For purposes of applying, the distinction of which field you came from, is not hugely important (unlike in India, where it is). The entire applying 'scene' has so many complexities that its quite hard to make valid inferences. The only trends that I have come to see are that its much harder to get funding in EE than in most other *engineering* fields. I won't get into reasons, but if you have a border-line area of interest, that could very well split across to CS, please apply to CS. Aid, and admits are a lot easier to come by in CS, and in fact, all other fields, progressively. Mechanical, Civil... as the field gets less and less popular, the chances of being accepted go up.

2 Things that do matter while you're still at college

Because the Americans only follow GPA systems, such as those of the IITs and BITS, they're not in a position to differentiate between a 65% average from Delhi university and a 75% from Andhra university. Forced to decide, they may go for better numbers, but they give a lot of latitude to the applicant to prove his worth.

2.1 Papers

Ideally, you ought to have done *some* kind of paper-related work while at college. Reason being that you might end up doing similar work with your Prof in the US, either directly being involved in research or just formatting information. Prior experience into what goes into the making of a professional ‘paper’ helps. Knowing the IEEE standards, for example, helps. Winning contests, at any level is good. If nothing else, it tells them that you have made an effective presentation.² How much value they assign to your paper also depends on what the title is - if it sounds too general, and is, it will hardly carry any more weight than any seminar you gave at college. If it conveys research results that you and say, a friend, experimented with, the title of the paper ought to reflect that it is research. More weight. They’ll appreciate best if it is published, and published in a U.S journal (ideally, the IEEE). Do keep in mind, that there are just a handful of students anywhere in the world who submit research work ready for IEEE at the undergraduate level. Those who do are in a position to be offered admission at the top universities. Getting acknowledged for paper presentations, however, still helps.

2.2 Project Work

Your project work is the best way they are able to make out what kind of field experience you might have, and how well you might be suited to their graduate class. A lack of it surely puts you at a disadvantage, and you’ll have to depend on scores and the SOP to pull you up. There is no hard-and-fast rule that asks you to do project work only in the field for which you are applying. They look at it as breadth of exposure if you’ve tried out other aspects of your discipline. Your best project (usually your final year project) would generally have to be in your intended area of specialization [else you’d need additional material to support why you want to work on something else]. Extra project work never hurts, so keep at it right through college if you can. Team up with friends, keep your mind open to new ideas, and read the local technical journals (‘Tronics students could refer *Electronics For You* for project ideas. It adds substantial weight to your application, and gives you a chance to say something earnest and heartfelt when you start writing your SOP.

The Indian Academy of Sciences allows for students to work with Profs at IISc, TIFR and a whole lot of great places. The ad appears on the last page of the *Resonance* journal, every December issue. They’re looking for motivated students, who want to do short-term research. You’ll even be paid a stipend for it. It’s a ‘scholarship’ programme, so when that term appears on paper, you’ll be a hero. No kidding, it will matter a lot. Be on the lookout for such opportunities.³

2.3 Additional courses

I’m not talking about electives. I am referring technical courses offered by institutes outside your regular college of university. In some cities, there is a branch of the *Institution of Electronics and Telecommunication Engineers* (IETE). They offer a broad range of short-term courses that supplement university learning. Take them, and get a feel for the subject from the industrial or non-academic point of view. If you intend specializing in a particular field, you should consider taking additional courses, as it signifies intent, on paper at least, of your academic interests. It’s a major value add-on. You’ll realize that everyone wants to see you good ‘on paper’. Remember that, and work towards it.

² *Good Documentation skills count.*

Professors can distinguish professional documentation from run-of-the-mill print-outs from Word. Impressions do make a difference, so if you have the resources, go right ahead - you will rarely if ever find a Prof. who won’t have access to postscript or T_EX readers

³ Apart from trying to get at this ad, subscribe to *Resonance* - it’s a great journal for undergrads

3 What does it take to get admitted ?

A hundred and one things, luck heading the list. Seriously.

Call it fate, destiny, karma, or what you wish.

No threshold of pre-thought parameters, each maximized, can assure you an admission.

Some things do help in improving your chances.

Here they are :

3.1 Applying early really helps

To quote my prime example, one of my best friends, phenomenally qualified for a Masters Or Doctoral program in C.S, got rejects from every univ he applied to. Every. He had a CV that would depress just about anybody, and his documentation was done brilliantly. His applications for fall were sent out late Dec, right before the deadlines, by Fed-Ex. Its no use, friend, they probably just didn't have the time to read it.

Moral : Schedule your applications early :

- If you are applying for Fall (September admission), apply by the Sep-Oct before that. Yes, 1 year ahead, no kidding. They even recommend that on their web-sites. Go check. Their Dec 31st deadline is precisely that - a *dead*-line. Its pointless applying then, unless you're the son of Stephen Hawking or something.
- For Spring (Jan admission), apply by May-June-July. Their deadlines are often October 1st, but they vary substantially. Do check, and double-check.

My own personal experience says that Fall is better than Spring. This is because applying in Fall gives you more options in every way possible. I couldn't apply to a whole bunch of good universities (especially universities on the west coast) because they only had Fall admissions, and I was applying in Spring. Also, if you come in Fall, you would be eligible to apply and take internships the following summer, since you would have completed 9 months of Full-time status as a student. If you came in Spring (Jan), you would have to wait a year and a half before you're eligible.

3.2 Take the required tests well in advance of applying

Reason: scores, to *some* extent, decide where you can apply. At least the contrapositive works well. Low scores hurt, so no applying big. High scores don't mean much, you can apply anywhere you feel like. Do keep in mind that there is only a moderate correlation between high scores and admits from great universities. The admission process is highly subjective.

3.3 Do nothing to hurt your chances

Don't make a mess of your application, it *does* make a difference. It doesn't if you are extremely well qualified, but why take the chance? Work extra hard to make sure that everything on your application is consistent, all information is true and effectively presented. Double-check your application against each university's check-list, and finally, label everything required on separate brown paper envelopes, with the correct mailing address. These little things go a long way in 1) making sure that your application at least reaches the office it is supposed to, and doesn't get lost along the way 2) impressing them with your neatness and clarity in presentation. Like I said, the subjective aspects of your application count heavily. Don't ignore them.

3.4 Write a clear and effective CV

Don't get wrong facts onto your CV. You'll get pulled-up for it sometime or the other, and its not worth it. You can stretch a truth a little, (read: glorify mundane things) but don't present wrong or falsified information at any cost.

Make sure you have a logical flow to your CV. Don't, for example list your 'Professional skills' before your 'Education' section. Keep Extracurricular for the end.. a sample sectional flow from the CV that I wrote read (without the numbering) :

1. Education
2. Awards and Achievements
3. Professional Skills
4. Project Experience
5. Additional Courses
6. Miscellaneous
7. Extracurricular
8. Contact

Make the best of what you have. I didn't for example have papers that were published in *any* journal, but if you did, you ought to have a section labelled 'Publications'. Suit yourself.

Every line of your CV must be tersely written. Throw long sentence out - nobody's got the patience, really. Your CV on the whole will actually be skimmed through. So, its your responsibility to ensure that what you want them to know or see, can be seen. Up to you. Pick-up everything that you think the admissions committee would like to know about you and see how it may be presented on the CV. Don't ignore any 'minor' achievements - if you do a part-time job, or have assisted a company for anything, mention it - you'll be better off than someone who hasn't done any such thing. Revise your CV several times. Send it to people who know you well and keep asking for their opinion. Take it to your Profs, if you can. You never know how it looks like from the other side of the fence.

3.5 Write a brilliant SOP and work hard on it

Your SOP should not be your CV re-worded into an essay. It may borrow points from your CV and elaborate, but it should tell a longer and more interesting story : about you. If you can write decent school level English, you have all it takes to write an effective SOP. Look also at <http://www.statementofpurpose.com>. The SOP is not an undergraduate essay where you talk about your activities in 11th & 12th, or about your membership in such-and-such club while at college, or that you 'actively participated' in some technical fest (whatever that means). Your SOP is about you, less as a person, and more as a plausible candidate into their graduate class of 200x. Its about you, technically speaking, your experience(s) in the field you are applying for, and what you picked up during project work (or work at a company). Do not get into design or implementation details in your SOP - leave terse statements about these in your CV. If your %-age while at college is low, this is your chance to tell them what other things make you, and why you'll make an excellent student; conversely, if you have high scores on everything, this is a chance to tell them how good you are apart from your scores, technically. Beware of generalizing about anything, try and be specific and clear - it is much appreciated. Do not, as far as possible, exceed 1 page. Turning the page is a psychological burden on the reader you are risking. Unless you have something very important to say, don't stretch the SOP - a page, or less than a page, well-written, will do. More than do. You can well imagine the task of an admissions committee having to weed through pages of poorly written or incoherent text. Brevity and effectiveness in your SOP speak much about your mental preparation for Grad school. If you can't write a page to save your life, it reflects on your thinking ability. No one gets a fine SOP in a jiffy, though. So spend time on it. Finally, do not ignore comments and criticisms that your friends may offer. Email your SOP to distant friends and seniors, show it in print, get an idea of how it is being read. Does it get confusing? Does it get across who you are, academically? Are you missing out

something or underestimating the value of some experience that could be mentioned? The SOP is not 'just another essay'. Now, after you have finalized it, keep it ready in .txt, .doc, .pdf formats, for easy uploading - online submissions at different universities will expect you to send it in only one of these formats.

4 Applying to the right universities

This, of course, is the king of all stumbling blocks. Where should *you* apply? "Ok, he applied here and got in, she applied there and got a reject.. so that means I should..." You should hear statistical information with a pinch of salt. Don't make generalizations to suit yourself. If you do, make sure you make them with the right information. Applying *right* is sometimes all it takes to get an admit.

4.1 The Core focus of the Applying game

If you need funding, the updated truth of the matter [as of June 2004] is that you're unlikely to get it at the *Masters* level. There are exceptions, yes, and even fewer, hand-countable exceptions when an M.S student has assured aid on his I-20 before leaving his home country. Have realistic expectations, and push for the best.

4.1.1 Phase I - Pre-Applying

At universities where you are interested in applying, begin narrowing down by writing to Professors. Write to them about your background, your interests, and why you're interested in what you want to do - this is just a 'ping', a 'feeler', to see what kind of response your candidature has at that institution. Does the Professor plainly state facts, say not to write further, until admitted? Says that he's interested, but has no funding or space in his lab? Of course, you will not be writing to Professors unless you want to be a doctoral student (the golden days of the 90s are gone, when just about anyone could get a 'scholarship' from a university at the M.S level). So you have to be writing with the clear intent of *joining a lab*, for *specific reasons* - and your entire letter must not take a huge amount of text - keep it short, and straight-forward. Typically, you'd write to about 30-40 people at least. This is a fairly intensive process, so do keep an excel sheet that documents when you wrote, to whom, date of reply, and your comments about that university / Prof.

This process also saves you a lot of money - in terms of grad application fees - you'll be applying to only those places where you feel you have a reasonable shot at. Some very good chances at ('safety' schools), some 'maybe's, and some 'Vow-if-I-could-get-in's (fewer the better).

Ok, so you've applied to the schools that you short-listed, and now its done. You can sit back and relax. Or can you? Is the game over?

4.1.2 Phase II - Post-Applying

Here's where your persuasion and 'real-world' intelligence can count, either towards an admit, or maybe some form of aid. Applications for Fall are processed between mid-January to late April, typically. This is a time when you must keep in touch with your Professors and/or graduate admissions secretary. You've already spent much money just applying. Spend some more and call people in the US. Call the admissions office, find someone who would speak to you for a couple of minutes - you won't believe how informative 2-3 minutes can be, with someone willing to speak. What to ask? You can ask generic questions like how the application process works, you can say you're in touch, or have maied a particular Professor, you can even just tell them that the school is your top priority, and you would really like to come there.. you have no idea how important these things are - who knows who, who might speak to who... your admissions file becomes 'live', someone they 'know' by voice at least, an identity - so much heavier than just another pile of papers.

And mailing your (future) Professor, as a follow-up, is extremely important. It signifies interest, genuine interest in working with that person, in that lab and environ.. If the department home page hints at it, claims an open-door policy for Professors or people, don't hesitate calling a Professor. Guidelines - find his Office hours, and call only at that time - a Professor's 'Office hours' are usually the two hours in the week when practically anyone can ping him/her with anything. You don't need an appointment to call at this time. At any other time, it may sound impolite or inappropriate. So moral of story : be in touch... these things go a **long** way, and work *for* you. I can't tell you how many people I know who've been either admitted at top places (their top places, 'top' being very relative), or been offered support, or part-support just because they persisted and worked for it, through out the applying process.

4.2 How important are university rankings ?

They're only partly indicative of what you need to know. Rankings are objective measures of entirely subjective entities (univs), so the scope for error is large, and organizations reporting the rankings do acknowledge that. Take *indications* from rankings - when they say Stanford is #1, trust them, and don't apply. When they say Princeton is at #9, don't assume its any better a shot. When you read that Clemson university is at #54, don't say "No... that's too down below". See their department pages. They do good work in EE. NJIT, for example, is not very highly ranked, but it has one of the best Bio-med engg depts around, and commands very strong placements. Electrical Engineering (EE), for example broadly comprises of VLSI, Sigpro & Comm, Micro-electronics... some univs are better at some parts of EE than others. That kind of information is for you to find out. Ignore the first 10 in general, and beyond that, search. Extensively. Make the right decisions on your own.

4.3 So how exactly should I choose a university ?

Be careful, and very realistic. Here are some of the factors you should think about : Use these in conjunction with your responses from Professors to narrow down your university search.

- **Reason 1 : Costs**

If they're frightfully high, chuck (unless you're sure you can afford it, or you believe you have a fairly good chance at getting aid [being admitted into the PhD track]) Ex: RPI, a fab place is at \$37500 a year. Imagine you've got an admit from here (vow). Will you be able to prove the required funds ? See Section 1.4.2.

State universities are much, much cheaper, averaging around, say \$21000 a year.

Some univs are not state univs and are still affordable - ex: University of Utah (\$20k). Popular private schools are probably v.expensive. Know the costs of each university before looking at *anything* else. Also look at the financial guarantee form for international students and make sure they're asking for only a year's support and not two. (Some do: eg. Wisc-Madison) No kidding, first go and search for costs, know, digest the costs, then proceed.

- **Reason 2 : Preference by Legacy**

This often translates to *Legacy* due to your past seniors. Previous admits from particular universities for your seniors means a good thing for you if you apply there too. If they have performed well there, and say even, excelled, it helps you a lot. They start appreciating where you come from better (where = undergraduate institution). Your seniors might even be in a position to put in a word with a Prof to consider your application. (Note the lack of guarantees in the statement). Legacy, therefore, could be a considerably important component of your decision to apply to a particular school.

- **Reason 3 : Academic match**

Ideally, you match the university and the university matches you. The reason, for example

MIT chooses a particular international student in a field is because there's a match - *they* believe the student is competent enough to contribute something to their research program(s). *He* believes he has got something to contribute, in terms of experience or abilities. You and I may not qualify for the extra-ordinary demands of some universities, but a whole lot of student profiles at very good universities match our own. Finding the match is your concern. You have to look at the student pages and decide whether you find people similar to you. If I find someone from Bangalore University or if you, say, find someone from Bombay university (and you are from there too), there's an implicit 'match'. Start zero-ing in on the place, then. There's hope. If you find Indian students on their student pages, and they're only from IIT, think twice before applying.

- **Reason 4 : Research areas**

For some applicants, this is a very important criteria. Some students know exactly what they want to work on, and try and find out the kind of research being conducted by a particular univ in that field. Some still have options open, either because they've worked in many aspects of a particular discipline, or they haven't worked at all. Any kind of information that you need is already on the web. You show your responsibility by knowing well, and knowing right before you actually apply.

- **Reason 5 : Median GRE scores of incoming International students**

The only place I know of where you can get this kind of information is <http://www.usnews.com> and you've to pay for it (\$10). Not all univs release this info too, so your search may get sketchy with some places. Nevertheless, remember that only contrapositives make sense. With a univ reporting extremely high GRE percentiles for its incoming students, having a high GRE score doesn't mean a thing - it just means you fall into the range of their statistical averages. But you can infer, for example, that it will be a little difficult securing admission at such a place with a much weaker GRE percentile.

- **Reason 6 : Location**

I've indicated how costs vary with location in Section 1.5. Additionally, if you have someone at a particular location willing to host you, look around that area especially hard - it means huge savings. The other, substantial reason to consider location is : *Employment opportunities*. Don't go to the mid-west and expect to land a tech-job. Try and find out from a university's career services page, which employers visited the last year. This is just to get some idea. If you want to do bio-med work, for instance, think east coast, since the New Jersey area in particular, is filled with Bio-med and Pharma companies. Your exposure to what's available and what's not will be drastically different if you attend a university that is situated in the middle-of-nowhere. The more isolated the university is, the harder it will be for you to find out how things work in the real world⁴, because you *must* underestimate the validity of local knowledge at your campus.

4.4 A view on employment opportunities

Everyone looks for a job after graduation. It helps to know what works, and what doesn't. I'll only speak about my field, EE, because that is most familiar to me. Jobs in EE are hard to come by. What does it mean to be 'in EE' ? Definitions are blurred, but maybe one can define it to be a tech job that doesn't involve application development (the realm of most s/w jobs). Specifically, in Signal processing (Image/Audio/Video), jobs are hard to come by (I'm writing in June 2004). Somehow it isn't the early 90s anymore ! Why are they hard to come by? Most importantly, as students we don't understand what employers want until much later in the (job) application process. If we do DSP, we concentrate on theory, algorithms, and implementation. Often, that's simply not enough. DSP is almost always in conjunction with VLSI, and your 'market value'

⁴University-towns have this problem, usually. Here is an example of where *location* limits your exposure seriously. Even the 'fun' part is limited to the confines of your town. [Think Cornell, NCSU, most of the SUNYs..] Know this before applying, this will form part of your educational experience.

goes up, you become more 'recruitable' should you have such and such items on your resume. Another issue is that though Sigpro jobs exist, they're very often government based - in some way related to defense work.. and they will not typically take non-US citizens. Most of the algorithm-related sigpro work goes to PhDs (understandably). With Communications, lets just say its nearly impossible to say you're doing EE work, when essentially its completely about protocols, and the application layer. They'll recruit EE students who understand the digital communication framework, AND can program. Now that's a hard combination. Nine out of ten EE students I know didn't do serious programming in college [no one's fault, just a fact] And a huge slice of the EE job market needs you to be doing some fairly substantial programming. The most recruitable EE segment today is VLSI, and ASIC design. If you're into hardware work, or enjoy the chip-design process, you have good chances of getting employed for that sort of work. There are many, many companies [in the Bay area and in Texas, mostly] that need VLSI skills, and an EE-mindset. Again, the EE-mindset has to be a programming-friendly mind, because much of the initial work at these companies is patient VHDL, Verilog or something similar. Going into some field like Analog circuit design, or RF / Electromagnetics at this point may not be a very employer-friendly option. The more specific, and 'different' the field, the harder it gets to find people who would like to hire and/or sponsor you for an H1-B process. With all these scenarios, what really happens to EE graduates who do this, and that 'not-so-recruitable' something at their M.S level ? Most find employment, albeit in fields outside their own, or in IT. The 'scene' is just so complex that you have to experience it first-hand to get an idea of what it's like. But if one intends doing work in EE (as against CS, or IT), it becomes especially important to target, or focus your academic work and courses around items of interest to employers. Its a little unfortunate that one has to think of the recruitment process so early on into the gradate program.

There are **two central questions** that you have to answer for yourself :

- *What do I intend doing or focusing on for my Masters ?*
You to have go with some direction, and though you can change it later, the general wisdom is to minimize your settling time.
- *What, really, do I want to be doing after I graduate ?*

The answers, or your thoughts on these should help you lead or decide where you should be applying.

5 Application Details

5.1 Transcripts explained

Every college will ask you for an official set of University *transcripts* of 'all college-level coursework. Most universities ask for two sets. One goes to the main Graduate admissions office, one heads for the department to which you apply. Transcripts are essentially, attested copies of all your college-level marks cards, put in a brown paper envelope, sealed and stamped by the authorities.

How does one prepare transcripts ?

Actually, we aren't supposed to. The university makes them for you, on payment of a fee. Most of my friends, and all my seniors have made their own, because that was the only option available. In VTU, as of 2003-04, that has changed - you directly request a transcript (or multiple transcripts) from them, for a fee, and they will seal it and send it to you. You include it in your graduate study application. Simple, straight-forward. However, if your university is not streamlined into this as yet, fret not - read on; else {Skip to Sec 5.2}

Making your own set of transcript(s)

Let's assume you've decided on applying to 6 universities - make 12 sets of transcripts. Say you're in the 7th semester - you would have official mark sheets of at least 6 semesters. Photocopy each 12 times. Go to the office, ask them to stamp the Principal's seal or college seal on each one. Request if you can do it for them and spare them the effort and time. Give them

the originals along with 12 copies of that original. Let them verify it, then put a small verification mark. You've got these attested by the Principal, so put your huge bunch of papers in a thick folder with your name on it, and leave it for a few days with the Principal. Once you've got your attested copies, make out an 'Official Transcript statement' for your institution (try and get one from your seniors). This document basically says that "We don't follow the GPA system. Instead we dish out percentages... and this is how we award classes". It also certifies that you are a bona fide student of that institution. This again has to be attested and included with each transcript set. [I've included the statement as I had made it two years ago - its a .pdf file, and available parallel to this guide on my homepage at <http://www.udayarya.net>]. Once you're done with a set, put it in a brown paper A4 envelope and get the Principal to sign across the sealed flap of the envelope. This makes sure that they believe that it is a 'True Copy'. (What do you do if your university doesn't help you ?) Finally, mark in pencil which university the set is for so you can label them neatly later.

5.2 On recommendations

Touchy topic; In many countries other than the U.S & U.K, Professors and teachers in general are not particularly excited about writing a recommendation letter for you. Being from India, I presumed this was the situation specific to my country only, but apparently not. The recommendation is the classic way for someone to write about someone else's candidature. In classes where there are 50-60 students, the teacher barely knows the names of his top 5 students, anything more than a casual chit-chat would be miraculous. But applications require a deep, thoughtful letter, something reasonably well written (concise, sounding honest, and as much of an 'appraisal' as can be written, as against a fairy-tale picture of the student).

So what happens ? The onus falls on you, the student, to get that Reco about you! You've already thought out (and hopefully drafted) your SOP. Make a list of things that you think are good about you, and see if you can remember any particular occasion(s) that you can cite in context, since examples help immensely. Don't write more than a page, don't write less than half. Short, useless Recos from Heads of the Department won't help. If the recommender decides to write some unpleasant things about you, it'll hurt, regardless of who he/she is. If you have good, happy stuff written about you, it doesn't mean too much, and your application will be judged primarily on your credentials. It will not be influenced much by nice words and fantastic praises. Recommendations are a formality, as far as your applications are concerned.⁵ Make sure they at least look professionally done - they ought to have letterheads, department addresses, contact info of the recommender. All *your* responsibility. After getting them signed, seal them into an envelope, and get them signed across the closing flap. Complete all this, and don't expect they'll be moved much by them. It is like that only. (!)

5.3 Grading system

Their academic system works on a 4.0 scale. They generally applicants to have expect 3.0 and above. This does not translate to 75%. In India, we have 2 systems in practice - the ones at the IITs, BITS, and Anna University that use a 10.0 GPA system and the rest of India, working with percentages. Many universities have explicit conversions for every other type of grading system to their own, some don't and some have clearly defined procedures for Indian students. It is up to you to find out from the university web page whether such information is available. When in severe doubt and stress, mail the department or the admissions office. As far as I know, only the University of Wisconsin - Madison had a clearly mentioned GPA conversion for Indian students. It basically allowed for the fact that most people don't score beyond a ceiling of say 85% marks in engineering, and can therefore be assigned a GPA of 3.70+. Very happyfying indeed, but no other

⁵Unless you have stellar people to recommend you - then they don't fall into the background, they form the core strengths of your application. But such cases are rare - Professors at your home institution should be known as academics in other, foreign universities - they then complete an academic connection, and your recommender's word will have huge value. This might happen if you worked under a 'figure-head' or something

univ had this allowance. Generally, I made it a practice to put my eight-semester average (in %). Some had a place for a ‘Last-two-year average’, where I filled in exactly that, on a %-scaling.

Do NOT, however, use your own scaling method. A popular notion is to divide your percentage by the percentage of the topper in your department and multiply by four, to get a 4.0 GPA scaling. This might not be acceptable. Either leave the GPA field blank, where the instructions don’t allow you to fill it in (you are sending in your marks cards anyway) or fill in your 8-semester average. If you’re applying early, email the admissions office and ask them what you should be doing.

5.4 The Application packet

Get organized, make check-lists, and ensure that you have the right mailing addresses for everything. Clearly label each brown paper envelope with its contents, do not at any cost, goof up. These will be your first impressions with the admissions office(s). I’ll tell you what my application looked like. Each itemized point corresponds to a separate envelope, slightly larger than A4.

1. Heading everything else is the main graduate application - biographical details et al, *with* the required \$ payment. Included was a copy of the SOP, the CV, the bank guarantee, and Certificates of achievement in case there was no departmental application
2. If a departmental application was to be filled up, that’d be in a separate cover, with the SOP, the CV, and the certificates of achievement would be here. [This envelope would have the department address]
3. Transcripts Set #1
4. Transcripts Set #2 (send it in even they haven’t explicitly asked for it)
5. Letters of Recommendation (usually 3 sealed envelopes inside. Testimonials can go in too)

Take copies of the main application, departmental application and \$-draft for each university. Things get lost when you least expect them to.

6 Keeping people informed

There are some things that you shouldn’t neglect. They may be the politest things you would’ve thought of in a while, but they would be worth the effort.

6.1 Grad school offices

If you have more than one offer of admission, and have decided on one place, don’t close doors completely on the others. What if you want to transfer at a later stage? You’ve worked hard at getting an admit, now minimize your downside. Write requesting for a deferral of your admit for another semester, or year, whatever might be allowed. Grad school offices won’t really object.

6.2 People who wrote you recommendations.

The people who wrote recommendation letters for you - write to them (even if you meet them once in a while - write, so they’ll have it on record, its much better than a verbal thank you). Tell them you would be attending such and such university, and thanks very much for all the help. Also include a relatively life-time email ID that they can reach you at, and/or a local phone number.

This is how you can help build relations - do this for your juniors, even if you’re very bugged with the ‘system’. If nothing else, the impressions you create will be pleasant memories, and perhaps *your* juniors stand to benefit from your good relations. Eventually, we ought to be better off than before.

Right, I’ve had my fun writing this guide.

I hope you achieve your academic goals as I hope I achieve mine.



About the author

Uday graduated in Electronics & Communication from RVCE, Bangalore. Post graduation, he attended Columbia University in New York, where he completed a Masters degree in Electrical Engineering, with specializations in pattern recognition, and mathematical finance.

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