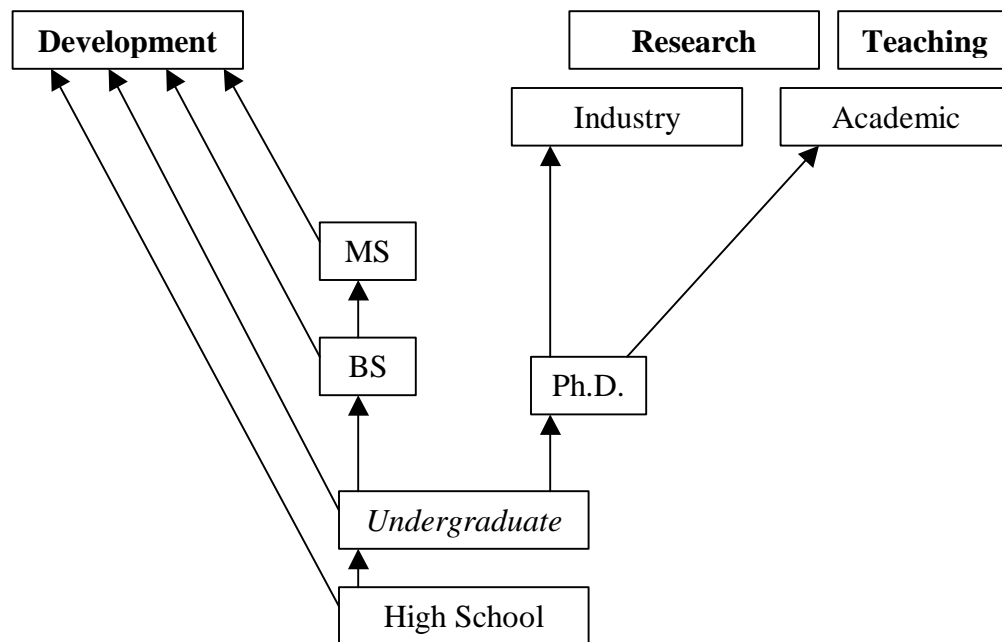


## Development vs. Research

Being located in the Silicon Valley, Stanford students seem to have a sense of having to be part of a startup or an already established and big company in order to be successful with computer science. But there is another path besides development that can be taken: research.

Development allows end products to be seen very quickly while research is a slow process where 10 to 15 years is the normal time frame for seeing the fruits of labor. Development fills short-term implementation needs while research creates long-term revolutionary changes. Many ideas eventually move from the research side to the development side. Examples such as database management systems, networking hardware, and the Internet all started as research projects which turned into commercial development ventures such as Oracle, Cisco, and more.



## Graduate School

At Stanford there are two graduate programs: the masters program and the Ph.D. program. Stanford undergraduates can get a masters through a coterminal program. 25% of Stanford CS undergrads go on to the coterminal program. The masters program is course work based and allows for additional depth and specialization in a subfield of computer science. Undergraduate success matters a lot in the admission committee’s decisions about applicants. The School of Engineering sets a minimum undergraduate GPA of 3.0 for acceptance to a graduate program. Students with a 3.6 or higher are virtually guaranteed to get into the CS coterm program. Those students who fall between a 3.1 and 3.6 need to overcome their “GPA deficit” with really good recommendation letters and GRE scores. The MSCS is perhaps the most cost-effective degree. It does not take as long as a Ph.D. and tuition can still be defrayed by TAing. The coterm also

offers the additional benefit of being able to stay at Stanford and not waste time adjusting to a new university environment elsewhere.

The Ph.D. program has three main elements: 1) Comprehensive exams in a wide variety of areas; 2) Qualifying exam which demonstrates readiness for research in the field; and 3) the dissertation. The dissertation is the largest part of the Ph.D. program. It involves picking a research problem that no one else has solved and solving it. It takes several years for research and then writing up 150 to 300 pages takes some more time. The author also has to defend his or her dissertation in front of a committee.

The number of applicants for CS Ph.D.s has fallen but admission is still very competitive. The top five schools are MIT, Stanford, Berkeley, Carnegie Mellon, and Cornell. But the top 50 schools are all very good. The Ph.D. admissions committee looks for candidates who demonstrate general intelligence, a good CS background, and, most importantly, research potential. Research potential is not based on GPA but is rather demonstrated through undergraduate research experience (having published a paper, doing an honors thesis, etc.) and good recommendation letters.

Ph.D.s go on to work as researchers in industry and in universities. Those who work in universities also get to teach. There is a lot of movement and overlapping between industry and academic research though. Companies such as Microsoft, Lucent, and Xerox have large research divisions that work closely with universities. Researchers must be independently driven but are able to work on whatever they want.