Statement of Purpose

My Goals

My long-term goal is to be actively involved in research and teaching in the area that I am interested in. A Ph.D. would be the crucial first-step towards this goal. During my education experience, I have developed strong interest in Computer Vision and I eagerly hope to study deeper in this area. After carefully pondering over my aptitude, interests and ultimate career aspiration, I have decided to pursue a Ph.D. degree in the University of Southern California (USC) in Computer Science, specifically in the field of Computer Vision.

Academic achievements

With my craving for knowledge, independent study ability, creativity and diligence, I've excelled in both of my top ranked undergraduate and graduate programs in China.

The competitiveness of my undergraduate major Electronic and Information Engineering of Harbin Engineering University (HEU) is ranked 6th in China among 461 universities which have the major by Research Center for China Science Evaluation. My undergraduate GPA ranks 3rd among 122 students in my major.

The competitiveness of my graduate major which is Information and Communication Engineering at Beijing University of Posts and Telecommunications (BUPT) is ranked 1st in China by the China's Ministry of Education. And BUPT's graduate students' employment rate is ranked 1st as well by the China's Ministry of Education. For my excellent performance in research and GPA during graduate period, I was awarded the National Scholarship for Graduate Students which is the highest honor for graduate students in BUPT and only awards 2.5% top students in BUPT.

Research experience

My interest lies in Computer Vision, especially in using large scale visual data to help computers to understand the visual contents, and it started from my undergraduate courses of Image Processing and Pattern Recognition. Dealing images with programming and algorithms in those courses attracted me a lot, especially when computer models had some intelligence trying to understand the images such as automatic segmentation, classification, recognition, etc.

My undergraduate thesis "Automatic image segmentation based on pulse coupling neural network and swarm intelligence optimization" under the guidance of associate professor Hongyuan Gao has given me a chance to explore computer vision related areas in greater depth (details in CV). The power of artificial intelligence for vision problems in this project really attracts me, learning and implementing those advanced algorithms brought me great joy. Besides, my advisor's enthusiasm for original research and teaching has really impressed me and I also expect to enjoy that enthusiasm in my future career.

During the first year of my postgraduate study at BUPT, I took part in a commercial software development project which aims to inspect screen printed touch panel circuit by machine vision (details in CV). This software was expected to reduce 30% man power of inspection for the circuit producing factory. Solving real life problems by programming with the knowledge about computer vision I'd learned is a very exhilarating process for me. The computers' ability to really substitute human to see and make decisions in this project impressed me deeply and confirmed my determination to study computer science in the future, especially on the topic of computer vision which aims to let computers actually see and understand the world. I also served as the student team leader for the last 3 months of this project, the leader experience taught me how to communicate with my student cooperators and with the responsible officers of the company which this software was expected to be sold to, it also taught me how to accomplish a large project by breaking it down to easier and smaller blocks of work, and how to assign work to different people to enhance the efficiency of cooperative software development.

My research topic for my master's degree is No-reference Image/Video Quality Assessment which aims to build algorithms that can automatically and precisely assess the perceptive quality of distorted images or videos without the availability of their undistorted versions. With great interest for vision models and prediction models, I have read a lot papers on this topic and realized more than 10 latest algorithms. Most approaches are based on the training and testing framework which has made me familiar with some machine learning approaches such as convolution neural network, unsupervised feature learning, filter learning, sparse representation, support vector machine, etc. The strong power of machine learning really amazed me and I realized that machine learning is indispensable and greatly helpful for large-scale computer vision problems. With the easier availability of large scale visual data, there are a lot more things we can do to help computers to understand the world, such as devising new metrics describing the similarities among visual data, finding visual correspondence across data, connecting visual data to enable understanding, etc. With great interest and curiosity, I eagerly hope to explore in the field of computer vision and machine learning during my Ph.D. research.

Computer science background

Since my majors are closely related with computer science, I have been exposed to the core fields of computer science as you can see from the relevant courses listed in my CV and Transcripts. With strong interest of solving problems by programming, I had also learned Data Structure and Python Language by myself. I'm learning Machine Learning with the help of online courses right now. Besides, my research experiences all lie in the field of computer science. Moreover, before my admission to your program, I still have more than a half year to learn computer courses and hone my skills of programming. I believe I will be well prepared for pursuing a Ph.D. in computer science before fall 2016.

Teaching experience

I had a few high quality teaching experiences as listed in my CV. I enjoyed a lot the process of imparting my knowledge to others and helping them to understand things. And teaching can also enhance my own understanding of a subject, sometimes it can even give me inspiration, which is crucial for research.

Why USC?

I have selected the Department of Computer science at USC as the place for my Ph.D. study because I find that the program suites my needs perfectly and that it possesses a strong faculty in the field of Computer Vision. The CV-Lab directed by Professor Gerard G. Medioni and Professor Ramakant Nevatia and the Multicomp Lab directed by research assistant professor Louis-Philippe Morency are the world-famous groups in Computer Vision. Besides, the excellent research facilities at USC would be greatly conducive to graduate research. My graduate advisor Prof. Aidong Men who is working in the field of Computer Vision has also strongly encouraged me to apply to your program. I believe that to be associated with your department would stand me in good stead for my future research career.

Summing up

Keeping in mind my long-term goals, my immediate goal is to work towards a Ph.D. in Computer Science. I am aware of the kind of dedication, persistence and resilience required by this task and willing to take on this challenge. I believe that I am adequately prepared for that, both in having the technical qualifications and the right mind-set for doctoral level research. I look forward to having a long and mutually profitable association with your esteemed department at USC.