Statement of Purpose

My Goals

My long-term goal is to be actively involved in research and teaching in the area in which I am interested. A Ph.D. would be the crucial first-step towards this goal. I have decided to pursue a Ph.D. degree in UC Berkeley in Computer Science, specifically in the field of Computer Vision, after carefully pondering over my aptitude, interests, education background and ultimate career aspiration.

Academic achievements

With my strong thirst for knowledge, intense curiosity for technologies, independent study ability and diligence, I've excelled in both of my top ranked undergraduate and graduate programs.

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

The competitiveness of my graduate major, Information and Communication Engineering, of 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 study, 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 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 Berkeley?

I have selected EECS department of UC Berkeley as the place for my Ph.D. study because the Graduate Program in Computer Science suites my needs perfectly and the research area that the computer vision group dedicates to is the very area that I want to explore for my future research. The EECS department's tradition of collaboration across disciplinary and organizational boundaries, dedication to education and outreach, close ties to industry, and the supportive culture also made me eagerly want to associate with this group. Moreover, the strong entrepreneurial spirit which makes Berkeley a hub of innovation and exploration attracts me a lot as well, since there is very similar dense entrepreneurial atmosphere in BUPT which I appreciate a lot. The entrepreneurial spirit can infuse more vitality into research work and can affect research work to a more practical and realistic way. I believe that pursuing Ph. D. in EECS department of UC Berkeley would stand me in good stead for my future research career and I am confident that I will make a positive contribution to the ongoing research work at Berkeley.

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 Berkeley.