STATEMENT OF PURPOSE

Over the years, I have developed a keen desire in expressing myself through digital arts, computer graphics, animation, and music, whose capability and capacity as a vehicle of expression have fascinated me and satisfied my aspiration to create. I have designed numerous websites and graphical layouts, taught myself 3D computer graphics (3DCG), and played with midi keyboards and audio editing softwares. Although computers are powerful tools for rendering complicated effects and artistic styles through simulation, it remains difficult for artists to translate their intentions into input parameters or programming languages. Thus, I intend to pursue a graduate degree in computer science and contribute my talents to narrow the gap between technology and digital artistry so that the artists can effectively express their full creative potential.

My passion for the digital arts, especially 3DCG, has motivated me to take advanced courses in image synthesis, image processing, digital visual effects, computational photography, and real-time rendering. I have led many course projects including designing systems for art productions ranging diversely from a particle effect generator to a musical chord arranger. Notably, friends and I spent several months surveying and writing a ray tracer program accelerated with streaming SIMD extension in our sophomore year. This was my first encounter with what is inside the blackbox of 3DCG and the excitement was unforgettable. These collaborative software projects provided me an in-depth understanding of the technical basis of many art tools that I once used. Such hands-on experience with digital art uniquely qualifies me for the Computer Science MS Program in "Real-World Computing."

I am most proud of my contribution to the development of "Lighting-By-Guide System." As an undergraduate student of Communications and Multimedia Lab, I was in charge of the project under the supervision of Professor Yung-Yu Chuang in 2011 and 2012. Through this experience I acquired the essential traits that are needed of an independent researcher in computer graphics. I have learned to discover bottlenecks through benchmarking and examining intermediate products, and consult resources from journals to manuals on encountering obstacles. Furthermore, I learned to not only ask crucial, but the right questions that will and have led to significant improvements. I managed the project through all engineering phases in the development of the "Lighting-By-Guide" algorithm, which predicts the quantity, positions, and properties of lights in a 3D scene from an artistic depiction of the anticipated render, specifically, the lighting-guide. The system largely reduces workloads of lighting artists by offering them a lighting configuration which closely resembles the conceptual illustration. My proposal of the "most-noticeable-light-first" optimization target has succesfully achieved a fast convergence and low perceptual difference between lighting-guides and images rendered with the particularly predicted set of lights.

My proficiency and foundation in research came not only from my abundant engineering experiences, but also from the concrete scientific trainings that I had recieved. Since 2008, I have double-majored in chemistry and computer science. As a natural science major, the study of chemistry has instilled a methodical emphasis on thinking critically and logically, both of which have complemented my training in the engineering with its emphasis on innovation and systematic analysis. I was invited

to join the Theoretical Chemistry Lab led by Professor Yuan-Chung Cheng. We verified innovative designs of nonlinear electronic spectroscopy by simulating the quantum dynamics of molecules interacting with laser pulses. Through the formulation and the implementation of physically accurate models on computers, I acquired experiences working with various numerical algorithms and visualization packages. Moreover, the environment has cultivated my down-to-earth attitude toward solving issues whose reasons are not understood. To me, revealing the causes and effects of phenomena is far more urgent than getting codes to run. These skill sets and reflection of a scientist are both transferable as well as have contributed to much of my success with the "Lighting-By-Guide" project.

My ultimate goal is to leverage both my scientific and engineering background as well as my strong desire in creating digital artworks to establish an animation studio both in the U.S. and abroad, including Taiwan. I hoped to work with a wide range of projects including the production of movies and developing intuitive tool sets for individual digital animators. Currently, existing production pipelines for animated films are designed primarily for large commercialized studios. As such, they hardly suit the need for individual animators with their smaller budget. I hope to help create a solution that will revolutionize the ways artists can convey their intentions onto their machines, so that they can fully share the artistic potential of computers and, thereby, liberating their imagination on what can be created or achieved. While mere passion is not enough to grant the fulfillment of this goal, I fully recognize the necessity in obtaining additional trainings as well as continuing further research to master the field of computer graphics at your prestigious institution.

The "Real-World Computing" specialization of the Computer Science MS Program at Stanford, with full access to graphic courses and sister disciplines, offers the challenges and opportunities I seek. This include the opportunity to work with faculties such as Professor Ron Fedkiw of the level-set method in graphical simulations, Professor Vladlen Koltun whose work greatly simplified 3D content creation, and Professor Pat Hanrahan whose contribution to rendering subsurface scattering effects sets the industrial standard. The challenge of working alongside the best and brightest student body will also be invaluable. One of my undergraduate projects, "Milktea Rendering," was inspired by several amazing works from the rendering competitions of the course "Image Synthesis Techniques" in 2008 and 2009. Hence, I full-heartedly anticipate in studying computer science at Stanford. With the guidance from your faculty, my diverse experiences and dedication to excel, I am confident in extending the frontiers of computer graphics as well as commencing my career as an industrial researcher in computer animation with a promising start.