



KENSEN SHI

A&M Consolidated High School, College Station, Texas

HOMETOWN: College Station, Texas

PROJECT: Lazy Toggle PRM: A Single-Query Approach to Motion Planning

FIELD: Computer Science

MENTOR: Dr. Nancy Amato, Texas A&M University

"I was inspired to do scientific research when I realized it would give me a chance to use my textbook knowledge to solve real-world problems and contribute to the scientific community."

Kensen Shi's passion for computer science led him to approach several computer science professors at Texas A&M University to find a mentor. Dr. Nancy Amato invited him to join her Parasol Laboratory, which focuses on the motion planning problem. This involves finding safe paths for moveable objects among obstacles, such as personal-assistance robots that aid the elderly. Kensen developed a new algorithm that could compute safe paths for virtually any type of robot more efficiently than other methods. The strategy, called Lazy Toggle PRM, is effective in a wide range of scenarios, including those with narrow passages and highly complex environments. "The most challenging aspect of my project was figuring out how I could implement my proposed algorithm to work with the thousands of lines of existing code in the lab's Parasol Motion Planning Library."

Kensen has won honors in a variety of mathematics and science competitions. As Texas American Regional Mathematics League Gold Team captain, he led his team to 13th place nationally. He placed 21st nationally in the USA Computing Olympiad Gold Division and was a US National Chemistry Olympiad finalist. A senior, he is captain of his school's Science Bowl team, which placed second regionally for two consecutive years. President of the Math Club, he presented a series of seminars on advanced topics and qualified for the USA Junior Mathematical Olympiad. He is an accomplished pianist, having won numerous awards in the Houston Forum Young Artists Piano Competition. He also loves to swim. Kensen aspires to become a professor and researcher in computer science.