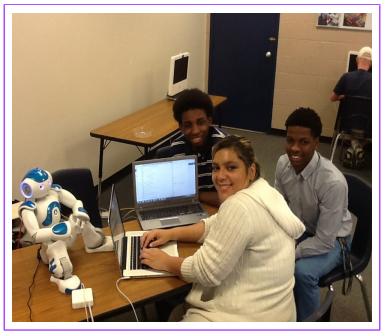
Student Seminar

Pi Mu Epsilon
& Gamecock Math Club

Autonomous Adventures with the NAO Robot

by Danielle Talley
USC Undergraduate Student



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During the summer of 2014, two students and I coded a NAO robot in Python coding language to perform three different autonomous tasks: design of winning strategies to games, design on human-like behavior motion planning for obstacle avoidance, and vision recognition applied to music sheets to identify and play songs. These three tasks are a clear exponent on how basic mathematics help achieve very complex feats in artificial intelligence. The design of strategies to win at games is done by generalizing root-finding techniques in Calculus. The analysis of the different strategies is performed with techniques of statistics. Motion planning is carried within the field of computational geometry, while the design of smooth paths is merely an application of interpolation. Finally, the project related to vision recognition is done under the scope of image processing and analysis, which is in a set of basic application of multivariate Calculus. This resulted in a game-winning, music-reading, obstacle-avoiding body of artificial intelligence.

Audrey Danielle Talley is a sophomore at the University of South Carolina. Previously a music major, she transferred to a local technical college and received her Associates in Science. She is currently pursuing a bachelors degree at U.S.C. in computer engineering and a minor in music. After getting her degree, she hopes to continue her education through graduate school. Danielle has experience doing research, including programming a NAO robot (summer of 2014) and at her current job, researching copyright permissions for articles written by professors at the College of Engineering and Computing to be deposited in the universitys institutional repository. Aside from school and work, she enjoys playing video games and the cello, which she has been studying for 11 years.

Tuesday 30th September 2014
6:30 pm
LC 303B

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