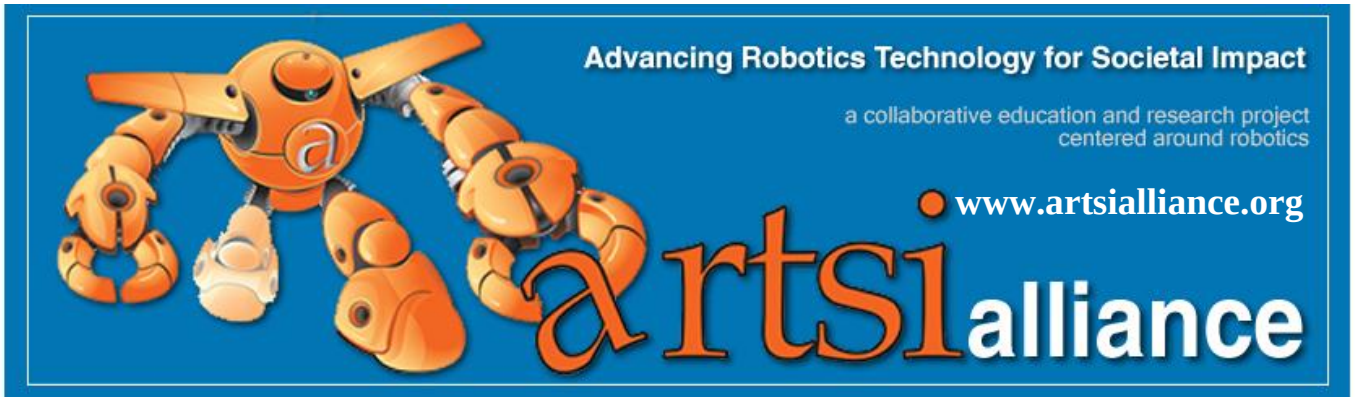

The Third Annual

ARTSI Student Research Conference

&

Spelman College Computer Science Olympiad IX

March 17 – 19, 2011

Florida Agricultural and Mechanical University

Tallahassee, FL

Broadening Participation in Computing Program

Message from the Conference Organizing Committee

Welcome to the Third Annual ARTSI Student Research Conference and Spelman College Computer Science Olympiad IX, hosted by Florida Agricultural and Mechanical University!

The ARTSI Alliance began as the successor to the C.A.R.E project, a collaboration between Spelman College, Carnegie Mellon University, Hampton University, Florida A&M, and the University of the District of Columbia. In the past three and a half years, ARTSI has grown into a consortium of 17 HBCUs and 10 major research universities. Over this past year, we ran a successful 2010 summer internship program for undergraduates, held a three day summer workshop for faculty, and conducted a variety of robotics-oriented outreach programs for middle school and high school students. Thanks to gifts from our corporate partners, member HBCUs are now using advanced equipment including iRobot Creates with ASUS netbook computers, and Chiara robots from Carnegie Mellon.

This conference is an opportunity for our students to showcase their accomplishments, meet peers with similar interests, and get to know faculty at other institutions who might offer internship or graduate training opportunities. The conference events include a robotics competition, a keynote speech by Dr. Emmanual Collins, faculty and student research talks, a poster session, and Olympiad competition. We hope everyone enjoys the events!

Clement Allen
Florida A&M Univ.
Conference Host
and Local Organizer

Tamara Rogers
Tennessee State Univ.
Robotics Competition
Coordinator

Rebecca Caldwell
Winston-Salem State Univ.
Student Poster Presentation /
Robotics Comp. Coordinator

Xuejun Liang
Jackson State Univ.
Oral Presentation / Robotics
Comp. Coordinator

Virginia Bailey
Jackson State Univ.

Mona Rizvi
Norfolk State University
Olympiad Coordinator

Iretta Kearse
Spelman College
Olympiad Director

Chutima Boonthum-Denecke
Hampton Univ.
Lead Co-PI, ARTSI Alliance
Conference Committee, Chair

Elva Jones
Winston-Salem State Univ.
Lead Co-PI, ARTSI Alliance

David Touretzky
Carnegie Mellon University
Lead Co-PI, ARTSI Alliance
Robotics Competition

The 3nd ARTSI Student Research Conference & SCCSO IX
Overall Agenda

Thursday, March 17, 2011

3:00 – 4:00 PM	**ARTSI Registration** (FAMU Grand Ballroom)
4:00 – 5:30 PM	**Robotics Competition Part I (**FAMU Grand Ballroom)
5:00 – 6:00 PM	**Dinner (**FAMU Multipurpose Room)
6:30 – 8:00 PM	**Robotics Competition Part II (**FAMU Grand Ball Room)
8:00 – 9:00 PM	**Poster Setup (**FAMU Grand Ball Room)

Friday, March 18, 2011

7:00 - 8:30 AM	**Breakfast** (Hotel/ Double Tree)
8:00 – 9:30 AM	**ARTSI Registration** Continues (FAMU / Perry-Paige Auditorium Room 200)
9:00 – 10:00 AM	**ARTSI Conference Opening Session** (FAMU / Perry-Paige Auditorium Room 200)
Welcome Address	Dr. James H. Ammons, President Florida A&M University Dr. Ralph W. Turner, Dean College of Arts and Sciences Dr. Edward L. Jones, Chair Department of Computer and Information Sciences
Keynote Speaker	**Dr. Emmanual Collins**, Florida A&M / Florida State University College of Engineering
10:00 – 12:00 PM	**ARTSI Faculty/Student Oral Presentations** (FAMU / Perry-Paige Auditorium Room 200)
12:00 – 1:30 PM	**Lunch (**FAMU Grand Ball Room)
1:30 – 3:00 PM	**ARTSI Student Poster Presentations** (FAMU / Perry-Paige Auditorium Room 200)
3:30 – 4:30PM	**Computer Science Olympiad** Check-in Registration (Hotel/Double Tree) **ARTSI Advisory Board & Faculty meeting** (Hotel/ Double Tree)
4:30 – 5:00 PM	**Olympiad Opening Ceremony** (Hotel/ Double Tree)
5:00 – 6:00 PM	**Dinner** (Hotel/ Double Tree)
6:30 – 7:30 PM	**Olympiad Event 1 - Cryptography – Cryptanalysis** (Hotel/ Double Tree)
8:00 – 9:00 PM	**Olympiad Event 2 - Hardware/Software Integration** (Hotel/ Double Tree)

Saturday, March 19, 2011

7:00 - 8:30 AM	**Breakfast** (Hotel/ Double Tree)
9:00 – 12:00 PM	**Olympiad Event 3 - Robotics – Lego NXT** (FAMU Computer Science/Banneker Tech Bldg) **Robotics Curriculum/Panel Discussion** (CS Tech Bldg, Room 201-A)
12:30 – 2:00 PM	**Lunch** (FAMU Computer Science/Banneker Tech Bldg)
2:00 – 4:30 PM	**Olympiad Event 4 - Web Design** (FAMU Computer Science/Banneker Tech Bldg)
5:00 – 6:00 PM	**Olympiad Event 5 - Programming / Google Gadget Demo** (FAMU College of Pharmacy)
7:00 PM	**Dinner / Awards** (Hotel/ Double Tree)

ARTSI Conference Opening Session

FAMU / Perry-Paige Auditorium Room 200

9:00 ~ Opening Session & Welcome Address

~ Dr. James H. Ammons, President Florida A&M University
~ Dr. Ralph W. Turner, Dean College of Arts and Sciences
~ Dr. Edward L. Jones, Chair Department of Computer and Information Sciences

9:15 ~ Keynote Speaker **Emmanual Collins**
Florida A&M University / Florida State University College of Engineering

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Keynote Speaker's Abstract:

Momentum Based Trajectory Generation for a One Link Manipulator with Heavy Loads

Abstract Humans regularly lift objects that are too heavy to lift quasi-statically. Common examples are luggage, book packs, grocery bags, and even gym weights. The key is that we have learned to use momentum to overcome the limitations of our muscles and effectively increase our lifting capacity. However, most current manipulator planning methodologies assume that an object can be lifted from one position to another only if there is a path for which at each point on the path the manipulator can statically support the load. Hence, the primary motivation of this research is to develop efficient trajectory planning algorithms that effectively increase the lifting capacity of a manipulator by using momentum (i.e., momentum based planning). The trajectory planning strategy uses Sampling-Based Model Predictive Optimization (SBMPO), which samples in the input space and can directly use a dynamic model of the robot.

Bio-Sketch Emmanuel G. Collins, Jr. is the John H. Seely Professor of Mechanical Engineering and Director of the Center for Intelligent Systems, Control and Robotics (CISCOR) at the Florida A&M University – Florida State University College of Engineering. He received his Ph.D. in Aeronautics and Astronautics from Purdue University in 1987 and also holds B.S. degrees from Morehouse College and the Georgia Institute of Technology. He spent 7 years in research and development at the Harris Corporation prior to joining the Department of Mechanical Engineering as an Associate Professor in August 1994. Dr. Collins performs research and teaches courses in the areas of control, robotics and dynamics. He is a researcher in the NSF-sponsored Quality of Life Technology Center, whose mission is to transform lives in a large and growing segment of the population – people with reduced functional capabilities due to aging or disability. He also performs research as part of the Robotics Collaborative Technology Alliance, which is sponsored by the Army Research Lab and aims to create future, highly autonomous, unmanned systems and permit those systems to effectively conduct military operations.

Faculty / Student Oral Presentation 10:00 AM – 12:00 PM

FAMU / Perry-Paige Auditorium Room 200

The Microsoft Kinect/Primesense Sensor: How it works and what you can do with it.

Camillo J. Taylor, University of Pennsylvania

Abstract The recent introduction of a cheap, mass-produced range high speed range camera has revolutionized the world of video games and promises to usher in a new era of robotic applications. This talk will describe the Kinect sensor, explain the basics of how it works and introduce some of the publicly available software libraries that can be used to access its functionality. It will also touch on the kinds of problems that researchers are interested in addressing with this sensor and on the kinds of applications that are starting to emerge.

Virtual Learning Environments in Education

Cheryl Swanier, Fort Valley State University

Abstract The term virtual is a common term in the 21st century, but what does it really mean? According to The American Heritage® Dictionary of the English Language the word virtual is used in various ways to denote things, activities, and organizations that are realized or carried out chiefly in an electronic medium. Technology is everywhere and is present in all aspects of our life. The demand for technology is at an all time high so there is a need for students to be creative and innovating to produce new products of the future. Virtual Environments is an emerging area in computer science that is can be beneficial and effective for students. This paper will explore how virtual environments and how they can enhance the learning for students. One particular way that virtual environments can enhance learning is through interactive video games.

High Altitude Robotic Navigation

Solange Artie, Florida A & M University
Faculty Advisor: Dr. Clement Allen

Abstract The Florida A & M (FAMU) Diamondbacks is a team participating in the NASA University Student Launch Initiative. This is a University competition where teams design, build and fly a reusable rocket that has a scientific payload. The FAMU Diamondbacks plan to incorporate a system into the payload which will act as a reconnaissance scout for a ground robot. The payload system will be designed to perform analysis on the environmental factors of its surrounding atmosphere while identifying and analyzing points of interest on the ground. After its deployment, the payload will employ sensors which shall take environmental recordings (i.e. pressure, temperature, relative humidity, etc) from its surrounding atmosphere in 5 second intervals. The thermometer, UV and irradiance sensors will be located on the surface of the rocket below the base of the nose cone. The hygrometer and barometer will be located inside the rocket in the payload bay. These sensor readings will be retrieved from the rocket after landing. The position data will be transmitted to the base station in real time from a GPS device also mounted within the unit. The GPS device will be partnered with the Perfect Flight MiniAlt/WD Logging Dual Event Altimeter. The payload components will not be separated at apogee.

Student Poster Presentation 1:30 PM – 3:00 PM

FAMU / Perry-Paige Auditorium Room 200

P1. Advanced Teleoperation Control System for PR2 Humanoid Robot

Jason C. Carter and Carlos T. Casiano

Morgan State University / Faculty Advisor ~ Dr. Camillo J. Taylor, Univ. Pennsylvania
Graduate Student: Anthony Cowley

Abstract The ultimate achievement in robotics is to build a robot that can perform a range of tasks just as a human. One such robot that is getting closer to this ability is the PR2 humanoid robot developed by Willow Garage. The PR2 has capabilities that allow the user to program different movements in order to achieve multiple assignments. As an open source robot, the PR2 allows users to read previous codes and manipulate them in order to complete new tasks. The purpose of this research is to output what the PR2 can see to a Head Mounted Display (HMD) worn by the user, and control the PR2's head with a motion tracking system called Vicon. The Vicon system captures the movement of markers placed along the HMD, and outputs an array of numbers that will go through code written with the Python programming language in order to retrieve the necessary coordinates. Next, these coordinates are sent to the PR2 and enables it to move its head to a specific point in space. With all the components working together, the user is capable of manipulating the PR2's sight to synchronize with a human's head motion.

P2. Pseudo-Gravity Application for Autonomous Mobile Robots in a Microgravity Environment

Jamie E. Johnson

Florida A&M University / Faculty Advisor ~ Dr. Clement Allen

Abstract Mobile robotics in space exploration is one of the scientific topics at the forefront of research in the twenty first century as the human race continues to explore the universe. The advancement of mobile robotic systems has allowed an increased ability to perform human-like tasks in environments not suited for living organisms. The improvement of the robotic systems during planetary exploration is essential to improving the quality and quantity of experiments that can be performed in space. The experiment proposed by the Florida A&M University Microgravity team for the NASA Reduced Gravity Education Program will test the effects of microgravity on an autonomous robot. A structured environment will be fabricated for the robot to perform a variety of tasks throughout the duration of the parabolic flight sequence. The robot's performance of the assigned task will be observed throughout all ranges of gravity. The effect of microgravity on the physical behavior of the mobile robot will be analyzed by comparing robot performance during different segments of the flight. A quadricopter will be attached to the mobile robot to provide a pseudo-gravitational force to the robot and aide it in performing the required tasks. The effects of the quadricopter on the autonomous robots performance will also be analyzed in this experiment. The team expects the robot to have variations in power consumption during gravitational changes. Locomotion issues may also arrive. Ideally, the robot will perform in a considerably similar manner independent of gravitational conditions.

P3. SnackBot

Neil Greene

Florida A&M University / Faculty Advisor ~ Dr. Clement Allen

Abstract The SnackBot is a Human Computer Interaction machine. It goes around and recognizes people wandering around a location (Carnegie Mellon) and asks them if they would like to purchase a snack from its snack tray. The problems that the developers and myself faced in 2009 for the SnackBot was a new audio/video telemetry, which was handled by Hasani Burns and myself. A new GUI interface, which was handled, by Sophie Zhou, and the overall software infrastructure was handled by Pong Savetsila.

P4. SnackBot: Summer REU at CMU

Hasani Burns

Hampton University / Faculty Advisor ~ Dr. Sara Kiesler and
Dr. Paul Rybski, Carnegie Mellon Univ.

Abstract The SnackBot was created to navigate the floor area and deliver food items ordered by occupants of the offices. The SnackBot though, has the potentiality of not only becoming much more than a robot that delivers snacks, but also being a beacon of innovation for robotics in general. A robot that can traverse, recognize, interact, and respond to humans, and real life situations, is where the future of robotics lies. In this poster paper, the exploration on capturing audio and video, and how they were implemented are described.

P5. Blackout Robot: Emergency Robot Providing Assistance During the Blackout

Samantha L. Allen and Hasani Burns

Hampton University / Faculty Advisor ~ Dr. Chutima Boonthum-Denecke

Abstract The robot, nicknamed "Blackout," was created in order to be an emergency robot to assist one in any number of emergencies. Though limited in resources, we have produced a robot with the capability of, not only recognizing a threatening situation within a household, but also being able to provide assistance in small, but vital ways to a young child home alone, a senior citizen, or even one with a disability. Our presentation will focus on how far we've gotten in the time we've had, and where we possibly plan to take this robot in the future. This includes further implementations, and necessary augmentations to make "Blackout" even greater.

P6. BarBot: A Drink Delivery Service

Jennifer Gregory and Justin Hodges

Hampton University / Faculty Advisor ~ Dr. Chutima Boonthum-Denecke

Abstract BarBot is a robot that can deliver service to people. This robot is designed to carry drinks down a straight path to a person. When BarBot reaches the person, then the person picks up the drink, and BarBot then returns to the starting point.

P7. Introductory Robotics in a First Programming Course

Jason Allen, Fikre Kiros, and Trevor Saunders

University of the District of Columbia / Faculty Advisor ~ LaVonne Manning

Abstract The use of introductory robotics can help to enhance creative thinking and problem solving skills in a CS-0/first programming course. Our research is to see if using graphical interface robotics programs can be as or more effective in an introduction to programming course than other introductory programming methods. The basic programming constructs of sequence, selection and looping were tested in a visual environment. Example labs are created to illustrate these concepts. A final project example: "envision a robot that serves a societal need" was created using Lego Mindstorms. Our group created a program that instructs a robot to travel from its home point to a predetermined destination via a predetermined route utilizing sonar and light sensors while carrying a payload then empty its payload at its destination and return home. Further applications of this program would allow certain custodial services to become automated on a scalable platform.

P8. The Robot Snack Food Coach for Reducing Childhood Obesity : Developing a Vision Algorithm

Amelia D. Henderson

Spelman College / Faculty Advisor ~ Dr. Ayanna Howard, Georgia Tech
Dr. Andrew Williams, Spelman College

Abstract The growing increase in childhood obesity is a serious public health concern facing the United States today. Obesity has been attributed to a combination of genetic, behavioral, and environmental factors. The numerous health problems resulting from childhood obesity include high blood pressure, high cholesterol, Type 2 diabetes, asthma, liver disease, and sleep apnea. Also, obese children often suffer from low self-esteem, anxiety, and depression. One means of addressing childhood obesity is through changing behavior by educating children on proper nutrition and healthy food choices. An effective and interactive way to provide this education will be through programming a robot to act as a snack food coach. This poster explores the development and use of a vision algorithm to detect barcodes on snack foods.

P9. Motion Tracking on A Surface with TISCH

Gary L. Moore Jr.

Tennessee State University / Faculty Advisor ~ Dr. Monica Anderson, Univ. of Alabama
Dr. Tamara Rogers, Tennessee State University

Abstract Tangible interaction is becoming widely used in the world today. This can be seen in devices such as smart phones, iPad's as well as surface tables. Tangible user interface (TUI) is human interaction with digital information through the physical environment. A local company, The Realm is looking for a very innovative way of grasping the attention of their customers through tangible interaction. The software used in making this task possible was Tangible Interactive Surface Collaboration between Humans (TISCH). The task called for using a projector, computer, sensors, as well as a camera. The goal was to have the projector display the company logo on the floor by the projector and once a person passes over the company logo, the display would show the company sponsors.

P10. Remotely Controlling a Robot through Bluetooth

Arthur B. Billingsley and Daryl A. England

Norfolk State University / Faculty Advisor ~ Dr. Thorna Humphries

Abstract In this project, Lego Mindstorm NXT 2.0 was used to build a robot that could be remotely controlled via a Bluetooth controller. The robot that was designed was used to represent a wheel chair. Two Lego intelligent bricks were used in this project, one to control the robot, simulating a wheelchair, and the other serving as the remote. In this poster, we will discuss our model for the wheelchair and the programs that were used to control the robot.

P11. Facebook, good or bad

Corey L Tyler

Fort Valley State University / Faculty Advisor ~ Dr. Cheryl Swanier

Abstract Increasing numbers of teenagers and adults are turning to social networking sites such as Facebook to make friends, chat, and organize social events. These innovations have made some aspect of life easier and are a powerful tool for communication, but they also blur the line between our personal and professional personas. With the veneer of friendship that's offered on these sites, it's all too easy to reveal more information falls into the wrong hands, problems can arise within a person life or employment.

P12. Security of Personal Information

Jahmi Liburd

Fort Valley State University / Faculty Advisor ~ Dr. Cheryl Swanier

Abstract As the World Wide Web is continuing to grow with information and resources so are the attacks on your personal information and resources, so are the attacks on your personal information. There has been a large increase in identity theft, computer viruses, computer hacking, phishing, as well as other attempts to obtain valuable resources. As technology continues to grow and change, so is the number of attacks on your information. To those who are not familiar with the many different attacks that are used to access information they become easy predators. Through knowledge of these scams and practicing personal security techniques, you can keep your information safe and combat attempts of unwanted sources to access your information. If users take the necessary steps to prevent personal information loss they will adequately be prepared on how to handle intrusions.

P13. Artificial Intelligence: the future of America

Lauren O Johnson

Fort Valley State University / Faculty Advisor ~ Dr. Cheryl Swanier

Abstract Being a college student with a slight learning disability and short attention span when it comes to focusing on school work, but I can sit and play video games or computer and pay attention to it all day long. I believe that the use of artificial intelligence will enhance the learning ability of younger students. For example, by exploring video games, e-books, and mp3 players as a medium one would see the advantages of how incorporating artificial intelligence into the daily routine of teaching and how it will enhance the learning experience.

P14. Data Point Visualization and Clustering Analysis

Keenan R Black

North Carolina A&T State University / Faculty Advisor ~ Gina Bullock

Abstract The primary purpose of this research project was to create a research tool for 3D data point visualization and clustering analysis, which is one of the most popular data analysis methods in bioinformatics and chem-informatics. For this purpose, we have implemented the Barnes-Hut Tree algorithm in C# to visualize cluster structures of 3-dimenisional data and added the function to a visualization tool, called PlotViz, which is written in C# and Microsoft XNA graphic libraries, developed by the CGL research lab in Indiana University. We have also performed clustering analysis of real research data used in IU bio- and chem-informatics research groups. Among many clustering algorithms available, in our analysis, we have applied two popular clustering algorithms, k-means and hierarchical clustering, by using R, which is a standard statistical analysis tool, and compared the qualities by measuring "withinness" which is the sum of Euclidean distances between cluster centers and points for each cluster group. The results are also compared by visualizing the data points in 3D by using PlotViz.

P15. Hand Tracking in a First-Person Video

Anton Jones

Winston-Salem State University / Faculty Advisor ~ Ekaterina Taralova, Carnegie Mellon Univ.

Abstract Temporal segmentation of human motion into actions is central to the understanding and building of computational models of human motion and activity recognition. Several issues contribute to the challenge of temporal segmentation and classification of human motion. These include the large variability in the temporal scale and periodicity of human actions, the complexity of representing articulated motion, and the exponential nature of all possible movement combinations. This paper will present a system that performs automatic hand tracking in a first-person video. The system consists of two main components: (i) The display of images with two rectangles to identify the area of interest for the activity recognition. (ii) A unified technique for tracking of hands using an hand tracking algorithm; and comparing it to the ground truth of an image. This is constructed by combining 2 algorithms for comparison.

P16. Building a Small Low Cost Effective Robot Swarm

James Hill and Brandon Heath

Winston-Salem State University / Faculty Advisor ~ Dr. James McLurkin, Rice Univ.

Abstract My summer research project consisted of two assignments. First was to program a Nordic transceiver to communicate with each other, and my next assignment was to create a program using OpenCV and Microsoft Visual Studio to detect IR blobs for tracking and identifying multiple robots. These projects were a small part of a bigger goal to build a small low cost effective robot swarm that can interact with each other in various ways.

P17. Player/Stage Interface for Arm Manipulation

Jason Brooks

Winston-Salem State University / Faculty Advisor ~ Dr. Monica Anderson, Univ. of Alabama

Abstract Robots provide a useful service in a wide range of application areas. Whether it's industrial manufacturing, assistive technology, or space applications, the robot and specifically the robotic arm allows many tasks to be accomplished that would ordinarily be impossible. Robotics is becoming more and more accessible laypersons, young students, and hobbyists. Software such as Player/Stage and hardware such as the iCreate robot, allow many people to use and program robotic arms. This research project consists of the design of an interface in Player/Stage which would allow one to program and manipulate a robotic arm with commands such as "open grip", and "move left". The goal of this project is give students and laypersons the opportunity to program a robotic arm without having to deal with the kinematics of the arm.

P18. Visual Tracking: Vision-based Detection

Jasmine Ferguson, Crystal Batts, Joe Mullgrav, Kristen Dunlap, Kionna Davis, and Arsenio Jeffreys

Winston-Salem State University / Faculty Advisor ~ Dr. Elva J. Jones and Dr. E. Rebecca Caldwell

Abstract The Navigation of robots provides position and also requires robots to have room to move freely in its given environment. Navigation of mobile robots is an incredibly significant topic; covering a large spectrum of different technologies and applications. It draws on some exceptionally ancient techniques, as well as some of the most sophisticated space science and engineering techniques. While the human-machine boundary is not yet at a crystal clear level that is with robots accepting and following spoken instructions; which is a problem in the realm of natural language processing, the degree of self-sufficiency obtainable after a machine has been programmed is considered purely science fiction. In conclusion, localization from robots senor involves recording its data, and its ability to distinguish and handle many object located in particular environments. Mobile Robot Navigation covers a large spectrum of different systems, requirements and solutions. We used the Mindstorm NXT to investigate the problem of programming a robot to move in any required direction, while keeping a record of its actual position and angle with any reference to starting points using lines or ground markers.

P19. Search and Rescue Autonomous Robots

Khendra E. Reid

Winston-Salem State University / Faculty Advisor ~ Dr. Elva J. Jones and Dr. E. Rebecca Caldwell

Abstract The use of autonomous search and rescue robots will decrease the response times for emergency responders reaching survivors buried under ruble. These robots also will help in the war zone with injured soldiers. With more and more of these robots being built more people will be saved when disaster strikes. Urban Search and Rescue (USAR) has already conducted research in this area creating robots to be used after a disaster. Some were used immediately after the 9/11 attack. To test these robots they use different arenas that test the skills and abilities of the robots. Robots used in search and rescues are special uses robots. To address the problem of a need for more search and rescue robots, we propose to use the general purpose robots in a search and rescue role. To demonstrate the feasibility of this approach, two general purpose robots were used, the Lego Mindstorm robot performed rescue tasks that could be completed using less expensive general purpose robots in times of emergency responder in finding victims and saving more lives.

P20. ChargeCar

Alejandro Sonato

Winston-Salem State University / Faculty Advisor ~ Dr. Illah Nourbakhsh, Carnegie Mellon Univ.

Abstract ChargeCar is dedicated to open, community-centered teamwork for making electric vehicles practical and affordable enough to revolutionize urban commuting. Most Pittsburghers receive their electricity from Duquesne Light Company. Duquesne Light Company was incorporated in 1903 and then in 1989 as DQE. The Duquesne Light Corp. provides energy to over 600,000 homes and businesses. The primary source for power is coal, however it is developing cleaner power sources, namely synthetics. Electricity from carbon-based fuels is responsible for a large amount of carbon dioxide emissions worldwide. Coal combustion produces the greatest amounts of carbon dioxide emissions per unit of electricity generated (2249 lbs of CO_2/MWh). If we assume that our power comes from entirely from coal, an electric car (about 4 miles/kWh) produces only about half of the carbon dioxide that an average gasoline car (about 25 miles/gallon) does, not counting the gasoline. As we move on to using cleaner, more efficient methods of generating electricity, the carbon footprint of your driving will decrease. Electric cars can take energy from any source, as long as it can be converted to electricity.

P21. The Robot Snack Food Coach For Reducing Childhood Obesity

Velvet Conley

Winston-Salem State University / Faculty Advisor ~ Dr. Ayanna Howard and
Douglas Brooks, Georgia Tech

Abstract Child obesity is a growing health problem in America. Indicators show that the percentages of children who are obese at the ages six to eleven years old that from nineteen eighty to two thousand and eight, have gone from six point five percent to twenty percent and for individuals twelve to nineteen years of age, the rates have gone from five percent to eighteen percent. Strategies to solve the current childhood obesity epidemic consist of educating parents about nutrition; providing affordable healthy foods; and opportunities for affordable physical exercise required to living a healthy lifestyle. Children should be encouraged to implement a healthy diet. This means that they need to be educated on what to eat, how much they should eat, how much is too much, to avoid health risks resulting from obesity. The focus of this study is to design a robot snack food coach that will have the ability to provide advice concerning food options which will assist the child in making healthy food choices. If given the opportunity to test the snack food coach out on a robot it would use a camera that was capable of reading the barcode off of a food item and then either display on a screen located on the robot or either speak the nutrition facts to the child. This allows the child to be able to know certain nutrition facts. The robot will then have the ability to calculate how much food the child has already intake and then be able to notify the child how much they should intake if any.

P22. Vision-Based Detection

Crystal Batts

Winston-Salem State University / Faculty Advisor ~ Dr. Elva J. Jones and Dr. E. Rebecca Caldwell

Abstract Road safety has been a historical concern in the United States. This research project compares the Monte Carlo and the Markov Localization vision-based detection algorithms and ways of modifying them to provide better solutions. The individual techniques of each method help improve how mobile robotics reacts in various situations that provide real-time solutions to different problems in road safety. The main two existing security algorithms are viewed and extend their implementation to motor vehicle systems. The two vision-based detection algorithms are the foundation for most algorithms that deal with localization of mobile robotics. Such algorithms are used in functioning mobile robots that can localize themselves in various environments and can mobilize to adapt to different situations. These algorithms can be extended to intuitive prototypes that can be used to demonstrate vision detection in automotive systems to improve road safety. The focus of this research is to demonstrate how vision-based detection can be used to improve road safety.

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Chartered Bus Schedule

During Conference Between FAMU and Double Tree Hotel

Thursday, March 17, 2011

2:00 PM Chartered Bus make the first pickup from the Double Tree Hotel to FAMU
4:00PM Chartered Bus make the last pickup from the Double Tree Hotel to FAMU

8:30 PM Chartered Bus make the first return trip to the Hotels

Friday, March 18, 2011

7:00 AM Chartered Bus will arrive at the Double Tree Hotel
7:30 AM Chartered Bus make the first pickup from the Double Tree Hotel to FAMU
8:30 AM Chartered Bus make the last pickup from the Double Tree Hotel to FAMU

2:30 PM Chartered Bus make the first return trip to the Double Tree Hotel

Saturday, March 19, 2011

7:00 AM Chartered Bus will arrive at the Double Tree Hotel
7:30 AM Chartered Bus make the first pickup from the Double Tree Hotel to FAMU
8:30 AM Chartered Bus make the last pickup from the Double Tree Hotel to FAMU

6:00 PM Chartered Bus make the first return trip the Double Tree Hotel

Sunday, March 20, 2011

5:30 AM Chartered Bus make the first return trip from Double Tree Hotel to **Airport**

* Aloft guests, please walk to the Double Tree hotel for Chartered Bus
** the Chartered Bus will leave Double Tree hotel and then pick up guests at Courtyard before heading to FAMU

HBCU Faculty

Claude Turner, Quincy Brown, Sharad Sharma	Bowie State University
Moayed Daneshyari	Elizabeth City State University
Clement Allen	Florida A&M University
Cheryl Swanier	Fort Valley State University
Chutima Boonthum-Denecke	Hampton University
Todd Shurn	Howard University
Xuejun Liang, Virginia Bailey	Jackson State University
Richard Pitts, Jr.	Morgan State University
Thorna Humphries, Mona Rizvi	Norfolk State University
Gina Bullock, Edmundson Effort	North Carolina A&T University
Iretta Kearse, Andrea Lawrence, Andrew Williams	Spelman College
Tamara Rogers. Keith Hargrove	Tennessee State University
Jessie Walker	University of Arkansas - Pine Bluff
Gurdeep Hura, Aaron Rababaah	University of Maryland Eastern Shore
LaVonne Manning, Dave Barnett	University of the District of Columbia
Hui Chen	Virginia State University
Elva Jones, Rebecca Caldwell	Winston-Salem State University

Additional HBCU Contributors

Tiffany Bussey	Morehouse College	Entrepreneurship training
Tarshia Stanley	Spelman College	ARTSI film festival; filmmaking instruction

R1 Faculty

Chad Jenkins	Brown University
David Touretzky, Sara Kiesler, Illah Nourbakhsh	Carnegie Mellon University
Jeff Forbes	Duke University
Ayanna Howard, Carl DiSalvo	Georgie Institute of Technology
James McLurkin	Rice University
Monica Anderson	University of Alabama
Edwin Olson	University of Michigan
C.J. Taylor	University of Pennsynvania
Dieter Fox	University of Washington

Affiliated Research Centers

Center for Innovative Robotics	Carnegie Mellon University
Center for Healthcare Robotics	Georgia Institute of Technology
Institute for Personal Robots in Education	Georgia Institute of Technology
Quality of Life Technology Center	University of Pittsburgh and Carnegie Mellon University

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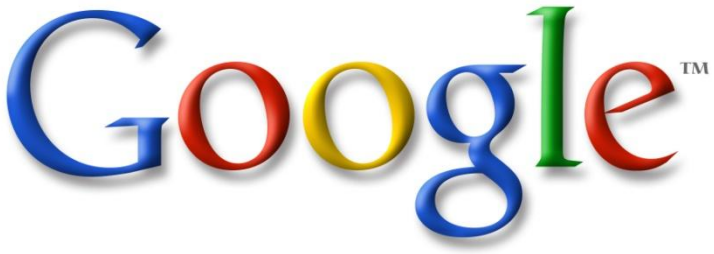

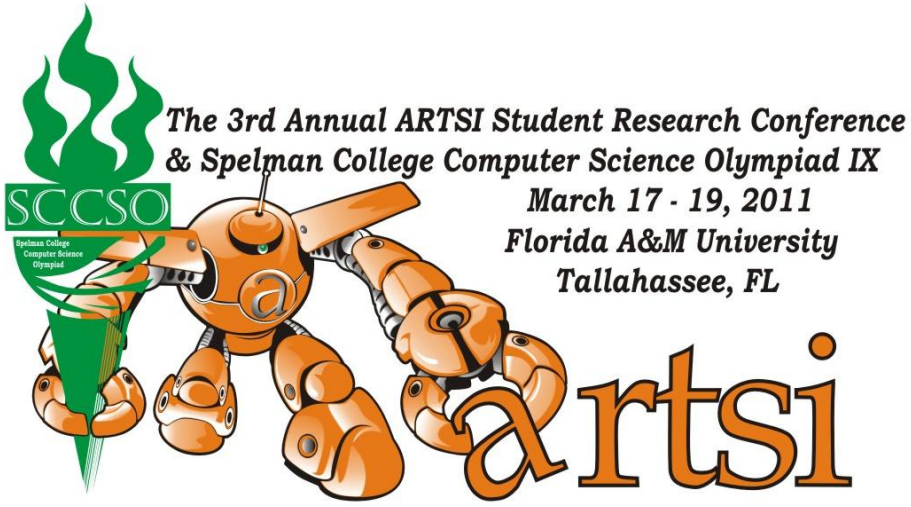

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