Welcome to AIMS² (HSI-STEM Grant) Meeting # 28

06/12/14

JD 1568
2 PM - 4PM
Sep 18, 2014
The AIMS² Project Team
Attract, Inspire, Mentor, and Support Students

Faculty and Staff from the College of the Canyons, Glendale CC, & the College of Engineering and Computer Science, CSUN
AGENDA

• Welcome and introductions of new Faculty Mentors/Staff

• Overview of grant
  • Program News and Plans for Year 4– Ramesh
  • Project Evaluation and Progress to date – Nathan

• Academic Progress of Cohorts
  • Glendale Community College – Jan Swinton, Scott Rubke and Richard Cortes
  • College of the Canyons – David Martinez and Eric Lara
  • CSUN – Bob Ryan, and Tesha

• Project Activities
  • IGVC – A proposal to engage students from GCC and COC with CSUN’s IGV team – Invited Guest – Prof. C. T. Lin (Time Certain: 3 PM)

• Summer Research Projects – Reports by Faculty Mentors
  • MSEM – Behzad Bavarian, ECE – Bruno Osorno, ME – Bob Ryan, CEAM – Nazaret Dermendjian, COMP Sci – Gloria Melara

• Adjourn
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Congratulations Dr. LaTesha Hagler
Outstanding Staff Merit Award 2014
We are really proud of you
Ramesh, S K

From: Elena Segura <esegura@edexcellencia.org>
Sent: Thursday, April 24, 2014 1:02 PM
To: Ramesh, S K
Subject: Examples of Excelencia—Program Nominated

Dear Mr. S. Ramesh:

Congratulations! Your program or department, HSI-STEM Project/College of Engineering & Computer Science, has been nominated for the 2014 Examples of Excelencia initiative. In order to be considered for this national recognition, you will need to submit a profile for your program no later than May 2nd, 2014 at 5 pm EST. You can submit your program’s profile and obtain additional guidance about the process at http://www.edexcellencia.org/create-profile.

Background:
Examples of Excelencia is the only national data-driven initiative focused on identifying and recognizing programs/departments with evidence-based practices that increase Latino student success in higher education. We focus on results and on disseminating these promising practices to others interested in serving Latino students.

Benefits:
This year, a committee of national experts will recognize four programs as the 2014 Examples of Excelencia, identifying one from each of four categories: associate, baccalaureate, graduate, and community-based organizations. Each will receive a $5,000 financial award, a featured listing in the 2014 edition of What Works for Latino students in Higher Education, and inclusion in our online searchable Growing What Works database. A representative from each program will be flown to Washington, DC for the 2014 Celebracion de Excelencia, held September, 30th 2014 and will be invited to be part of a plenary panel to discuss their work on October 1st, 2014 for the ALASS (Accelerating Latino Student Success) Workshop.

If you have any questions, please contact us at examples@EdExcelencia.org

We look forward to learning more about your program or department’s efforts to accelerate Latino student success at the associate, baccalaureate, graduate, or community-based organization levels.

Best,

Elena Segura
Program Manager
Excelencia in Education
www.EdExcelencia.org
1717 N St. NW, 2nd floor
Washington, DC 20036
202-785-7350 ext. 1104
From: Elena Segura
mailto: esegura@edexcelencia.org
Sent: Tuesday, August 26, 2014 12:10 PM

Dear Mr. Ramesh,

Congratulations! Your program has been selected as one of this year’s Honorable Mentions for Examples of Excelencia in the Baccalaureate category! Please take note of the following events and materials needed to prepare the celebration of your success.

Events:

Celebración de Excelencia: Please reserve September 30th to attend Celebración de Excelencia to be held at the St. Regis Hotel in Washington, DC where the selection of your program as an Honorable Mention will be made officially public.

AIMS2 Program recognition: http://www.edexcelencia.org/2014

ALASS: On October 1st we invite you to attend the Accelerating Latino Student Success (ALASS) workshop where the four selected Examples from each category will share the success of their program with an audience of approximately 70 educational, policy, government, philanthropic, and Latino advocacy leaders.

Compendium: The program will be featured in 2014’s edition of "What Works for Latino Students in Higher Education Compendium". I will send you the final version of the profile that will be included for your review.

Attached to this email, please find the official letter recognizing CSU Northridge Engineering and Computer Science HSI-STEM Initiative as one of this year’s Honorable Mentions for Examples of Excelencia in the Baccalaureate category.

Congratulations once again and thank you for your work to improve Latino student success!
Some believe a focus on race and ethnicity divides us as a society. At Excelencia in Education, we believe acknowledging racial and ethnic trends describes our society in useful ways. Using data and analysis to identify factors that influence the success of specific student populations establishes the base line information from which to develop more effective policies, engage diverse stakeholders, and enhance the active and tactical responses needed to better serve Latino and all students.
CSUN to host White House STEM Summit

- Invited by the White House to host national event (one of four campuses)
- Date: October 7, 2014
- Focus on College Opportunity and broadening participation in STEM
- Supported by the Helmsley Trust and the White House OSTP
Goals and Objectives

- To increase the number of Hispanic and low-income students who successfully transfer from Glendale Community College (GCC), and College of the Canyons (COC) to California State University, Northridge, to pursue majors in Engineering and/or Computer Science.

- To increase the number of Hispanic and low-income students who join CSUN as upper division transfer students and graduate with degrees from one of the undergraduate programs in the College of Engineering and Computer Science.

- To develop a model, seamless and sustainable transfer program to assist Hispanic and low-income students to successfully transfer from GCC and COC to California State University, Northridge where they will complete their studies in Engineering and/or Computer Science.
Project Activities

- Tutoring to improve student performance in preparatory Math and Science courses.
- Advising and tracking of students in cohort
- Work closely with faculty and staff in feeder community colleges to develop seamless articulation agreements, especially for students transferring from 2 year colleges to CSUN.
- Create a mobile digital environment with Tablet PCs, iPad’s, and appropriate software, so that the project team can work with the cohorts to enhance communication, engagement, collaboration and creativity, and instant learning assessment.
- Expand Facilitated Academic Workshops (FAW) in required introductory courses and key upper division courses offered by the college’s programs
- Faculty/Peer mentoring and career advising of students in the cohort
- College wide events focused on careers and jobs such as the biannual Tech Fest events held in February and September.
- Provide students with opportunities to work on hands-on projects and research activities that encourage them to stay connected with their majors
Nuts and Bolts

- All cohort students meet regularly as a group with faculty mentor and peer mentor from their respective program.
- All cohort students maintain an online journal using Moodle with submissions required on a monthly basis – responses to prompts and additional information.
- All faculty mentors maintain an online journal with submissions required once/semester.
- Lead project faculty from GCC, COC and CSUN meet regularly to address gaps in articulation agreements and collaboratively develop curriculum to address gaps.
- Monthly meetings of the entire team to review progress on key project measures and activities.
- Annual meeting with External Advisory Committee.
- Bi-annual gathering of the cohorts at partner colleges to promote interaction.
Students served to date

Since January 2012 we have served a total of 161 students in three cohorts (approximately 67 % Latino/a). This includes 87 first-time transfer students at CSUN, 38 students at GCC, and 36 students at COC.
## Budget Update

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</tbody>
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IGV Hybrid Team

STEM Research/Application Project

for AIMS2 Program

• 9/18/2014 • by C.T. Lin
Mechanical
RED RAVEN 2.0
RED RAVEN 2.0 features an improved linked logic design inspired by the Mars Rover Rocker Bagge suspension system, keeping the original design of RED RAVEN. Two dual-action dampers were added to minimize top platform motion and tip as shown to the right.

Special features of RAVEN 2.0 are drive train decouplers, used to isolate the drive wheels to turn independently from the motors. RAVEN 2.0 maintains a CS centered above the drive axle, allowing for zero-radius turns on the spot.

LINJA
LINJA utilizes a dynamic frame inspired by the success of RED RAVEN. It features a front pivot for a flexible frame and an independent drive wheel suspension system using a unique linear bearing(Yoshi Slider design), shown to the left.

Power
both RAVEN 2.5 and LINJA emphasize efficiency and durability. The power delivery system emphasizes efficiency by concentrating all power distribution into a single board, key components, such as the motors and battery packs, are protected by fuses on the power distribution board. DC to DC converters, the CLAMP module, and Protective Circuit Modules (PCM) in the battery pack. The CLAMP module protects the motors from reverse-acking damage. Each motor also has a voltage regulator that regulates the voltage developed during deceleration. This voltage could damage the motor's servo controller. Finally, the batteries themselves are constructed from lithium iron phosphate (LiFe) battery packs and PCM. Each of the forty-eight battery cells is susceptible to over-charging, over-discharging, and deep-discharging which could cause them to rupture or ignite over time. The PCM is each battery pack prevents the cells inside the battery, ensuring they a long life. Finally, LINJA uses an autonomous as a backup. Furthermore, it is also responsible to collect and store data for image calibration.

Safety
Vehicle safety is a primary concern; as such an emergency stop system comprising a wireless remote and a physical push-button are incorporated into the robot design. The wireless remote system functions in excess of 100 feet away, and the push-button stop is easily accessible and clearly visible.

Outcomes
This project provides students the opportunity to work as a team, learn leadership and project management skills, and presents a yearlong challenge to design, build, program, and test a successful product. Systems such as the power system, navigation system, line recognition, motion control, and cognition algorithms work together seamlessly to successfully navigate a difficult obstacle course. Skills and methodologies learned in the process are relevant in various areas both related to and unrelated to robotics, including industrial, aeronautical, space, residential, and military applications, to name a few.

Software Systems
Vision
Vision is the eye of the vehicle. It uses cameras to see its surroundings. It then corrects the images to make the data more useful. On Red Raven, a single camera feed is used to guide the robot. Light sensors and a microcontroller assist with light balance. On Linja, there are two cameras that acquire a wide angle of view to assist with better maneuverability of the robot. This method introduces less distortion, though the images must be combined.

Navigation
Navigation features a goal priority setting algorithm which finds the fastest path through a set of GPS waypoints. This system is similar to how traffic GPS sensor behaves.

Digital Compass

Cognition
Cognition is based on an obstacle avoidance algorithm known as Radial Polar Histogram (RPH), which constructs a radial path to avoid obstacles and reach its goal and react to the environment as perceived by the sensors. This algorithm generates a desired turning radius and velocity for motion control to execute. It can also identify some obstacles and calculate its future location.

Motion Control
Vehicle motion is executed by the use of a differential drive which is similar to the operation of a wheelchair. Motion control utilizes dynamic velocity and acceleration functions to perform accurate motion executions.

System Integration
The sensors, motors, and controllers all work together to execute a task.
A Proposed Hybrid Team Model

- A hybrid team of GCC/COC/CSUN for 2015 IGVC
- Focus on
  - Design Challenge
  - Auto-Nav Challenge: Basic Course
    - Vision
    - Cognition
    - Navigation
  - JAUS Challenge: Defer to next competition in 2016
- Use an off-the-shelf platform for vehicle chassis
- Encourage non-AIMS2 program student participation in the hybrid team
Contact Information

College Dean, S.K. Ramesh
s.ramesh@csun.edu

ME Department, Professor C.T. Lin
ct.lin@csun.edu
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Meeting Calendar for Summer-Fall 14

- September 18th, 2014
- October 16th, 2014
- November 13th, 2014
- December 11th, 2014

*All meetings above are scheduled from 2 PM – 4 PM in JD 1568.

*Note: Fall 2014 Tech Fest – September 23rd, 2014