

Date of Hearing: February 22, 2008

Committee: Senate Education

Department: Education

Person Testifying: Patricia Hamamoto, Superintendent

Title: S.B. 2333, S.D. 1 (SSCR 2481), Relating to the University of Hawaii

Purpose: Establishes a working group to consider the feasibility of creating an institute of robotics within the University of Hawaii college of engineering; requires report on its findings and recommendations to the 2010 legislature.

Department's Position: The Department of Education (DOE) supports this Bill for the creation of a robotics working group. The DOE recommends that the working group be facilitated through a partnership with the University of Hawaii and the DOE.



# UNIVERSITY OF HAWAII SYSTEM

## Legislative Testimony

---

### Testimony Presented Before the Senate Committee on Education

February 22, 2008 at 1:15 p.m.  
State Capitol, Conference Room 225

by  
Virginia S. Hinshaw, Chancellor  
Presented by  
Peter Crouch  
Dean, College of Engineering  
University of Hawai'i at Mānoa

### **SB 2333, SD1 – RELATING TO THE UNIVERSITY OF HAWAII**

Chair Norman Sakamoto, Vice Chair Jill Tokuda, and Members of the Committee on Education:

Thank you for the opportunity to testify on SB2333, SD1 relating to the University of Hawai'i. We support the intent of the SB2333, SD1 and agree that robotics is a powerful vehicle for K-12 students to explore and develop exemplary skills in science, technology, engineering, and mathematics. For nearly a decade, the College of Engineering has been involved in multiple aspects of robotics education and outreach and has witnessed its tremendous impact on our students, teachers, and community. The many successful robotics competitions and the dramatic increase in interest and participation are strong testaments to this achievement.

We understand that much thought and effort is needed to leverage interest in robotics and to examine opportunities to effectively sustain robotics initiatives and programs. There are many possibilities and models for collaboration which can be explored and we would welcome and support further discussion.

At this time, the College of Engineering does not have the personnel or funding to support a "feasibility" study. It might be appropriate to convene a working group to discuss an Institute of Robotics or related Institute with consideration of the appropriate background science and technology fields, and application areas, on which an Institute will focus. In this respect, we recommend that any requirements for any type of study be deleted, the language be broadened to include Institute of Robotics or related Institute, and replace the term "consider" with "discuss." Once again, we support the intent of SB2333, SD1 however the College of Engineering does not have the resources to fulfill the requirements as detailed in SB 2333, SD1.

Thank you once again for the opportunity to testify and for your continued interest and support in the UH College of Engineering.

Statement of Art Kimura, Education Specialist, Hawaii Space Grant Consortium,  
University of Hawaii at Manoa, 1680 East West Road, POST 501, Honolulu, HI 96822,  
phone (808) 934-7261, email: art@higp.hawaii.edu

before the

THE SENATE

THE TWENTY-FOURTH LEGISLATURE

REGULAR SESSION OF 2008

SENATE COMMITTEE ON EDUCATION

Tuesday, February 22, 2008  
1:15 P.M.  
State Capitol, Conference Room 225

in consideration of  
Senate Bill 2333 SD 1,  
RELATING TO ROBOTICS TASK FORCE (INSTITUTE OF ROBOTICS)

Chair Sakamoto, Vice Chair Tokuda and Members of the Senate Committee on  
Education

I support Senate Bill 2333 SD 1 which would establish a task force to study the feasibility  
of an Institute of Robotics at the University of Hawaii.

One of the outcomes in support of catalyzing student interest in science, technology,  
engineering and math in the 2007 legislative session was Act 111 which in part,  
established a pre academy program that provided project based learning using robotics.  
Scholastic robotics programs in Hawaii have significantly increased not only in the  
availability of a variety of programs from elementary through high school but in ever  
expanding participation by students statewide. Hawaii is host to a number of nationally  
affiliated scholastic robotics programs including FIRST, FIRST Lego League, Botball,  
and underwater remotely operated vehicles through regional tournaments held in Hawaii,  
with winners advancing to national tournaments.

In 2007, Hawaii hosted a national robotics tournament (Botball) and the National  
Conference on Educational Robotics which drew the largest participation in that  
program's history at 65 teams including 45 from out of state. In addition, a program to  
be introduced in fall, 2007, VEX, will provide a unique opportunity for Hawaii to host a  
world championship including as many as 90 teams from Asia and the mainland United  
States as well as Hawaii. As noted in Senate Bill 2333, Waiakea High School became

not only the first high school from the United States to compete in the International Micro Robot Maze Competition in Nagoya, Japan, but returned after having competed against high school and college teams from Japan and Korea and winning three significant awards.

The mentor for this team, Riley Ceria, is a graduate of the University of Hawaii's College of Engineering who participated in a robotics program called Micro Mouse during his undergraduate study, which provided the foundation for his interest and expertise in mentoring the high school team. One of the team members, Kelson Lau, a junior at Waiakea High School, has designed and fabricated a bipedal robot which uses 8 motors (the Japanese bipedal robot used 3 or 4 motors) which was entered in the Big Island Science and Engineering fair; Kelson's project won 2<sup>nd</sup> place overall and he received an all expense paid trip to compete in the International Science and Engineering Fair in Atlanta in May 2008. In addition, his project received 9 other noteworthy awards as follows:

Best in Subject Category-Engineering: Electrical and Mechanical  
Best Science and Engineering Award  
Harold Sanders Outstanding Inventors Award  
Best in Technology Award  
HELCO Best in Engineering/Environmental Award  
U.S. Air Force Award  
Mauna Kea Observatories Outreach Committee Astronomy Research Award  
Canada/France/Hawaii Telescope Award

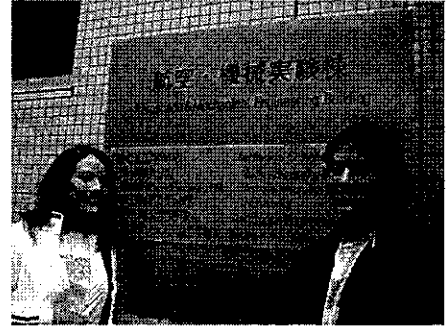
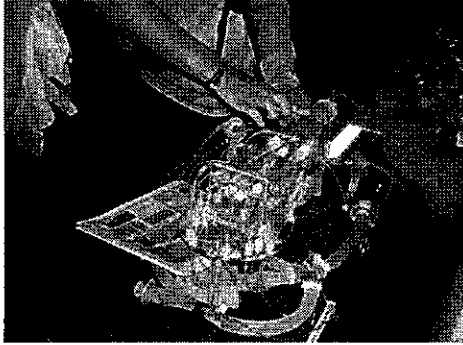
Kelson would like to return to Japan this fall to compete again in the International Micro Robot Contest. The international competition provides us with a measurement of the quality of students and mentors that we have in Hawaii. If we expect our students to compete in a global environment, we need to continue to provide our students with the opportunity to compete in national and international competitions. He is applying for a NASA summer internship.

As part of the Waiakea High School micro robot team visit to Japan, they were guided on a tour of the robotics laboratories at Nagoya University. The students could see the integration of academic disciplines in the research and the application of robotics to medicine, home assist care, home land security, and industry. A tour of the Toyota Commemorative Museum and the National Museum of Emerging Science and Technology show cased the applications of robotics in a variety of disciplines.

An Institute for Robotics at the University would serve to provide a means to foster integration of research and development of robotics as applied to various fields of academic interest and applications to agriculture, medicine, engineering, home land security, manufacturing, and the marine and aerospace environment. Further, it would be part of the work force development pipeline which spirals from elementary to middle to high school and to undergraduate and graduate study at the university. The Institute could also be the host for the current pre academy (robotics), thereby providing a

statewide program that begins at the elementary level and provides opportunities through college study. Students like Kelson would be provided with the opportunity to stretch their creativity into programs that have no ceiling, and contribute to societal and environmental needs.

Thank you for the opportunity to provide these comments.



Statement of Riley Ceria, Electrical Engineer, Caltech Submillimeter Observatory, 111 Nowelo St., Hilo, HI 96720, phone (808) 990-6582, email: rceria@submm.caltech.edu

before the

THE SENATE

THE TWENTY-FOURTH LEGISLATURE

REGULAR SESSION OF 2008

SENATE COMMITTEE ON EDUCATION

Friday, February 22, 2008

1:15 P.M.

State Capitol, Conference Room 225

in consideration of

Senate Bill 2333 S.D. 1,

RELATING TO ROBOTICS TASK FORCE (INSTITUTE OF ROBOTICS)

Chair Sakamoto, Vice Chair Tokuda and Members of the Senate Committee on Education

I support Senate Bill 2333 SD1, which would establish a task force to study the feasibility of an Institute of Robotics at the University of Hawaii.

As a graduate from the University of Hawaii at Manoa College of Engineering in Electrical Engineering, I feel one of the reasons that I have enjoyed engineering was due to my participation in a robotics competition called Micromouse. After participating in Micromouse, I was hooked on robotics, and in science and technology. After graduation I found a job with the Caltech Submillimeter Observatory, in Hilo, HI. Part of my job is to conduct outreach with the local community. Having enjoyed robotics to such a great extent in college, I decided to help mentor the students of Waiakea High School, my former high school, in robotics.

As a Waiakea High Robotics mentor I was introduced to all the different robotics opportunities that students have such as Botball, FIRST, Underwater Robotics, and Micro Robots. A couple months after starting as a mentor and Waiakea High, I was introduced to the International Micro Robot Maze Competition in Nagoya, Japan and asked if this would be possible to compete in as it was very technically challenging. Looking it over Waiakea decided to take on this challenge, and created 4 robots to take to Japan in November 2007. This is the first robotics competition that a Hawaii High School

participated in that required many higher level concepts. As all other competitions come with kits that can be built, the Micro Robot Competition only had rules that needed to be followed. Students had to design and build their own electronics and electronic boards, and even choose what components to use. They had to find suitable motors and ways to mount the robots together in a 1” cube. Finally after building, they needed to learn how to program a microcontroller that for the first time did not come bundled with precompiled libraries for them to use. As noted in Senate Bill 2333, Waiakea High School was the first high school from the United States to compete in the International Micro Robot Maze Competition in Nagoya, Japan, and returned with three awards after having competed against high school and college teams, including graduate level teams, from Japan and Korea.

The international competition provided us a ways to measure our students’ technological capacity against the world. After seeing their accomplishments after the competition, the students’ confidence grew as they now knew that they can do as well as other teams from around the world. Theses types of experiences are necessary if we want our students to be able to compete in the current global environment.

While in Japan, Waiakea High was able to enjoy a tour of science and technology. They visited a technical high school, and the robotics laboratories of Nagoya University. They were able to see how robotics is part of health care, surgery, military, space, automotive, and many other types of applications.

An Institute for Robotics at the University would serve to provide a means to foster integration of research and development of robotics as applied to various fields of academic interest and applications to agriculture, medicine, engineering, manufacturing, and the marine and aerospace environment. Further, it would be part of the work force development pipeline which spirals from elementary to middle to high school and to undergraduate and graduate study at the university. The Institute could also be the host for the current pre academy (robotics), thereby providing a statewide program that begins at the elementary level and provides opportunities through college study.

Thank you for the opportunity to provide these comments.

Statement of Eric Hagiwara, Mathematics Department Chair/Co-Robotics Advisor,  
Waiakea High School, 155 West Kawili Street, Hilo, HI 96720, phone (808) 975-4888,  
email: Eric\_Hagiwara@notes.k12.hi.us

before the

THE SENATE  
THE TWENTY-FOURTH LEGISLATURE  
REGULAR SESSION OF 2008

SENATE COMMITTEE ON EDUCATION

Friday, February 22, 2008  
1:15 P.M.  
State Capitol, Conference Room 225

in consideration of  
Senate Bill 2333 SD 1,  
RELATING TO ROBOTICS TASK FORCE (INSTITUTE OF ROBOTICS)

Chair Sakamoto, Vice Chair Tokuda and Members of the Senate Committee on  
Education

I support Senate Bill 2333 SD 1 which would establish a task force to study the feasibility of an Institute of Robotics at the University of Hawaii. I have been a part of Waiakea High School's Robotics program since its inception. Both I and my co-advisor, Dale Olive, have put in countless volunteer hours in support and development of our award winning program. Everything we do is in addition to our regular work. We are not compensated in anyway, but, we continue to commit to this program because we have seen how it has had a life changing affect on our student participants. We are now getting letters from former students who have now graduated with Engineering degrees. They have all said that our Robotics program was the inspiration to going into the Engineering field. Waiakea High School in regarded as one of the top ten feeder school into the College of Engineering at the University of Hawaii at Manoa. We send just as many students to Engineering programs at other Universities. I also believe that the statistics show that a large percentage of students who graduate from a University often will stay and work in the same State that the University is located. We need this bill to support our future Hawaii born Engineers.



Statement of Kelson Lau, Student, Waiakea High School Robotics, Waiakea High School,  
155 West Kawali Street, Honolulu, HI 96720, phone (808) 443-3507, email:  
electronics\_dude@hotmail.com

before the

THE SENATE

THE TWENTY-FOURTH LEGISLATURE

REGULAR SESSION OF 2008

SENATE COMMITTEE ON EDUCATION

Tuesday, February 22, 2008

1:15 P.M.

State Capitol, Conference Room 225

in consideration of

Senate Bill 2333 SD 1,

RELATING TO ROBOTICS TASK FORCE (INSTITUTE OF ROBOTICS)

Chair Sakamoto, Vice Chair Tokuda and Members of the Senate Committee on  
Education

I support Senate Bill 2333 SD 1 which would establish a task force to study the feasibility of an Institute of Robotics at the University of Hawaii.

In high school, I have participated in several different robotics competitions through the robotics program at my school. Through participating in these programs I have gained valuable skills such as programming and the engineering design process for building things. I am in an engineering core class in school but sometimes that isn't enough. Robotics opens up doors by allowing a first-hand application of the skills needed in the field of engineering. By participating in robotics, I now want to pursue a career in engineering. I think that scholastic robotics programs are important because it allows people to learn things that they would not normally learn in classes and gives them skills for college and their future.

Statement of Winston Dang

THE SENATE  
THE TWENTY-FOURTH LEGISLATURE  
REGULAR SESSION OF 2008

SENATE COMMITTEE ON EDUCATION

Friday, February 22, 2008  
1:15 P.M.  
State Capitol, Conference Room 225

in consideration of  
Senate Bill 2333 S.D. 1,  
RELATING TO ROBOTICS TASK FORCE (INSTITUTE OF ROBOTICS)

Chair Sakamoto, Vice Chair Tokuda and Members of the Senate Committee on  
Education

I support the SB23333 SDI Robotics bill. I am an F.L.L. coach and have seen the difference it makes on our kids. They learn to be independent thinkers. It also teaches them the importance of Math and Science and how it can be useful. We need this bill to provide an education pathway so that our kids can grow and flourish.

Statement of Amber Imai

THE SENATE  
THE TWENTY-FOURTH LEGISLATURE  
REGULAR SESSION OF 2008

SENATE COMMITTEE ON EDUCATION

Friday, February 22, 2008  
1:15 P.M.  
State Capitol, Conference Room 225

in consideration of  
Senate Bill 2333 S.D. 1,  
RELATING TO ROBOTICS TASK FORCE (INSTITUTE OF ROBOTICS)

Chair Sakamoto, Vice Chair Tokuda and Members of the Senate Committee on  
Education

I believe that this bill could only help the psuh for STEM related fields. Robotics motivates students who usually do not excel in school, and could be an incentive to continue their education. I am currently a student in UH Manoa's College of Engineering, and a graduate of Waiakea High School. As an active participant of Waiakea High School's Robotics Team for four years, I learned many skills that I have used in here, skills that I see some of my peers struggling with. Also, many of my friends who were a part of the robotics team and were not planning to attend college decided to try to get a degree. Robotics has been proven to help motivate students, and I think it would be a very valuable asset should it be implemented here at UH Manoa.

Thank you for your time.