

**SUMMIT** is a unique paid professional development program at Polytechnic University for middle and high school teachers from Regions 4, 6, and 8 of NYC school district. Funded by the New York State Education Department under its *Engineers of the Future* program, SUMMIT aims to provide middle and high school teachers with enhanced science, technology, engineering, and mathematics (**STEM**) educational content through a mechatronics training workshop.

### **SUMMIT PROGRAM**

SUMMIT introduces teachers to the multidisciplinary field of mechatronics. Using a structured and integrated learning environment, teachers will be trained and mentored to experience engineering design activities. This four-week program consists of tutorials, structured engineering design, and discussions to expose the teachers to mechatronics and team-based, real-world, engineering design. Teachers will be introduced to the following:

- scientific and mathematical foundations of circuit theory, sensors, actuators, and feedback control;
- integration of circuits, sensors, actuators, and control in practical contexts;
- introduction to and application of computer hardware and software for measurement and control including low-cost micro-controllers; and
- hands-on engineering design activities.

### **BENEFITS TO TEACHERS**

The SUMMIT program is an opportunity for teachers to:

- reinforce their present science and mathematics skills;
- enrich their STEM experience through exposure to real-world engineering applications;
- enhance the education of their students by embracing technology and by integrating hands-on mechatronics projects in classrooms, laboratories, science research, and new courses; and
- network with other local area STEM educators, engineering faculty, and the staff of university-based outreach centers.

### **BENEFITS TO SCHOOLS**

Upon successfully completing the SUMMIT program, teachers will be able to:

- provide their students with a solid foundation in science and mathematics that prepares them to study in STEM disciplines at the college level;
- assist students in conducting research and participating in science and robotics competitions; and
- become science/technology ambassadors in their schools.

### **ELIGIBILITY**

- Middle and high school teachers from Regions 4, 6, and 8 of New York City school district.
- Three years of full-time teaching experience in STEM disciplines.
- Endorsement by the school principal.

### **DURATION**

- Four weeks: July 16, 2007—August 10, 2007.
- Schedule: Monday to Friday, 8:30 A.M. —5:00 P.M., on Polytechnic University's MetroTech campus.

### **STIPEND**

Project participants who successfully complete all program requirements (including submission of final project report, participation in follow-up and assessment activities), will receive a stipend of \$6,000. Any income tax obligations are the teachers' responsibility.

### **SUPPLIES**

Each project participant receives an equipment kit consisting of a micro-controller and components to conduct laboratory activities in their schools.

### **RESPONSIBILITIES**

To receive a full stipend, participants are required to:

- Attend all training, engineering design project, and presentation activities.
- Complete a working design project, oral presentation, comprehensive project report, and project web page.
- Participate in follow-up activities.
- Conduct assessment of project impact in their classrooms and provide the results for reporting to the New York State Education Department.

### **SELECTION**

The SUMMIT program will host 20 teachers in the summer of 2007. Selection to the program is on a competitive basis. A complete application package consists of the application form, résumé, essay, and reference letters. Applications may be hand delivered or mailed. Names of those selected for the 2007 program will be posted on the project web site in early June 2007.

### **APPLICATION DEADLINE**

June 1, 2007

### **CONTACT INFORMATION**

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## **SUMMIT** **APPLICATION**

Type or print neatly

Date: \_\_\_\_\_ Gender: M / F

Name: \_\_\_\_\_  
Last First Middle

Position: \_\_\_\_\_

Department: \_\_\_\_\_

School: \_\_\_\_\_

Mailing Address: \_\_\_\_\_  
Street

City State ZIP

E-Mail: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

Home Address: \_\_\_\_\_  
Street

City State ZIP

Principal's Endorsement/Signature

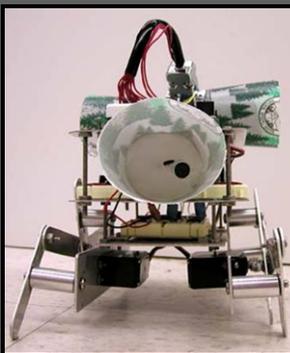
### **APPLICATION CHECKLIST**

- ☐ Résumé which includes information stating your
  - Education
  - Professional experience with relevant teaching history
- ☐ Essay (300-500 words)
  - Based on your teaching experience, what scientific phenomenon do you wish to demonstrate to your students with the aid of electro-mechanical sensors/actuators and micro-controllers? Explain how this will create an exciting learning activity for students.
  - What experimental facilities do you use at your school for hands-on learning activities? How have you developed an engaging curriculum using this facility?
  - How will you incorporate modern technology to enhance STEM education after participating in the SUMMIT program?
- ☐ Submit two reference letters from your:
  - Principal
  - Assistant-principal, department head, or a senior colleague who can comment on your professional background and future potential.

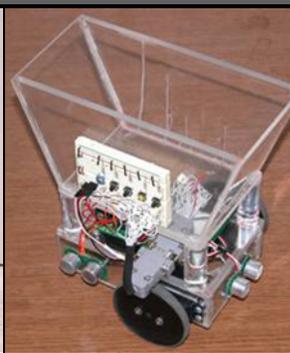
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# SUMMIT

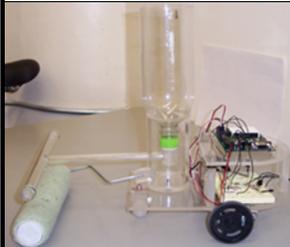
**Summer Mechatronics Institute for Teachers**



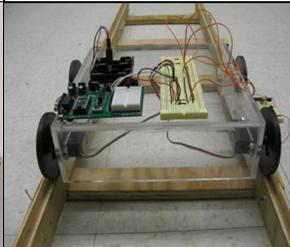
**Audio Enabled Hexapod**



**Smart Shopping Cart**



**Autonomous Polyurethane Applicator**



**Autonomous Joint Plate Inspector**

**Polytechnic University, Brooklyn, NY**  
Department of Mechanical, Aerospace, and  
Manufacturing Engineering  
Mechatronics/Process Control Remote Laboratory  
<http://mechatronics.poly.edu/summit/>

**polytechnic**  
UNIVERSITY

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The **SUMMIT** program provides an opportunity for middle and high school teachers from Regions 4, 6, and 8 of the New York City (NYC) school system to enhance their technical competency through professional development in the areas of science, technology, engineering, and mathematics (STEM). Twenty teachers will be recruited, trained, and mentored in hands-on engineering design experiences through a four-week long summer 2007 workshop at Polytechnic University. Teachers will study and explore hands-on activities in the exciting field of *mechatronics*—synergistic integration of mechanical engineering, control theory, computer science, and electronics to manage complexity, uncertainty, and communication in engineered systems. By the end of the SUMMIT workshop program, teachers will have learned to use sensors, actuators, instrumentation, and computer control hardware and software to develop and perform projects such as robotics; industrial and home automation; validation of global warming phenomenon; and design of web-enabled remote laboratory experiments.



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Education Department**

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**David Packard Center for  
Technology and  
Educational Alliances**