



K-12

Summer Workshop 2008

www.egr.msu.edu/~aslam

IEEE ROBOTICS & NANOTECHNOLOGY

Hosted at U of M Dearborn, August 18, 2008

Innovative Micro and Nano Technology Workshop for
K – 12 Educators

offered jointly by MSU, NSF WIMS ERC, Nanobrick, IEEE Education Society, and IEEE Robotics & Automation Society

with support from Lawrence Tech Robofest – www.robofest.net

UNIQUE LEARNING:

“A second grader rubs a plastic spoon on his/her dry hair and uses the negative charge created on it to turn on a computer switch (a PMOS device) embedded in a programmable robot.” What a fun way to start and stop a robot and an example of sparking children’s interest in technology-assisted learning.

In an innovative K – Ph.D. education and research program, developed at MSU, graduate and undergraduate students mentor K-12 students in hands-on Technology Assisted Science, Engineering and Mathematics (TASEM). The TASEM environment introduces micro and nano technologies to children in a very interesting and exciting manner.

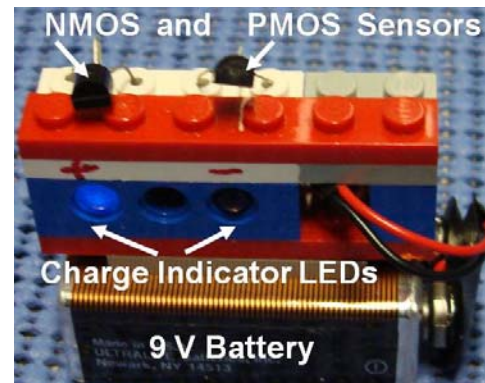
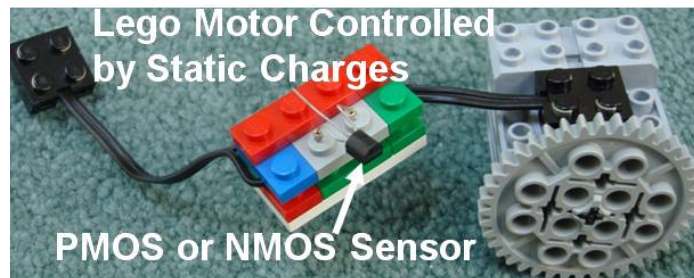
DURATION AND COST:

The educators will be divided into two main groups. Each main group will have 4-5 stations for each activity. The number of participants per station will depend upon the total number of participants. Each activity is appropriate for all K-12 levels. The total cost is \$25.00 per educator for 4 hours. All activities will involve programmable robots.

WHAT IS NEW IN 2008?

☺ **Static charges and charge generators:** Lego-based robotic static-charge generators (toy Van de Graaf generators) used to explain nano concepts, computer switches, logic gates, sensors and *microsystems*. A *microsystem* contains a microcontroller, sensors, actuators, software and battery; all integrated into one system. Mindstorm’s Lego Robotics Invention System (RIS) is an example of a *microsystem*.

☺ **A unique link between nanotechnology and static charges:** Lego-based learning modules use a top-down approach to explain nanotechnology using fun experiments with bubbles and static charges.





HOW TO REGISTER

1 Knowledge Areas

For further information: contact Mrs. Zahida Aslam at zahaslam@hotmail.com or Dean Aslam at aslam@msu.edu
Website: www.egr.msu.edu/~aslam

Learning Area	Learning Goals/Objectives	Appropriate for Grade Level
Programmable Robots, RCX	Learning about sensors, motors, gear trains, robot-building, -control & -programming, science, math & engineering concepts, inter-robot communication	K - 12
Programmable Robots, NXT	Learning about sensors, motors, gear trains, robot-building, -control & -programming, science, math & engineering concepts, inter-robot communication	6 - 12
Microcontroller Programming	Programming in C, compiling C code & downloading into microcontroller chips, building robots that sense the environment and respond to that, system integration	8 - 12
Nanotechnology and Static Charges	Concept of miniaturization & measurement, definition of nano, nanotechnology, use soap bubbles and static charge generators to explain nano concepts, use static charges to explain computer switches & gates, sensors, circuits, electrostatic forces & concepts, charge storage, build & program charge generators.	K – 12 (some activities appropriate for 6-12 only)

2 Workshop Schedule:

Table 1 Participants will be divided into two groups and they are expected to do all the 4 areas.

Times	10:00 – 10:15 am	10:15 – 11:15 am	11:15 am – 12:15 pm	12:15 – 1:15 pm	1:15 – 2:15 pm	2:15 – 3:15 pm	3:15 - 4:45 pm
Group I	Introduction to Hands-on Activities by Dean Aslam	Programmable Robots, RCX	Programmable Robots, NXT	Lunch Break	Microcontroller Programming	Nanotechnology and Static Charges	Guest Speakers
Group II		Programmable Robots, NXT	Programmable Robots, RCX		Nanotechnology and Static Charges	Microcontroller Programming	

Mail the registration form below and a check (\$25.00 per educator) made out to 'Michigan State University', with the memo line filled in to Dr. Aslam:

Dr. Dean M. Aslam
2120 Engr. Bldg., Electrical and Computer Engineering
Michigan State University, E. Lansing, MI 48824

Registration Form

Educator Name:
Grades Taught:
Phone number:
Email Address:
Special Requests, Food Allergies:

The workshop is held in Room # 120/121 at the U of Michigan – Dearborn’s Fairlane Center.

The University of Michigan-Dearborn
Campus Map

BUILDINGS Legend

- Academic Support Center AAC
- Administration Building AB
- Campus Support Services CSS
- CASL Annex CA
- College of Arts, Sciences, and Letters CR
- Computer & Information Science CIS
- Engineering Complex EC
- Engineering Lab Building ELB
- Environmental Intergration Center EIC
- Fairlane Center - North FCN
- Fairlane Center - South FCS
- Fair Lane Cottages FLC
- Fair Lane Streamhouse FLH
- Fair Lane Pony Barn FLB
- Fair Lane Powerhouse FLP
- Fieldhouse FH
- Garner Richard Center GRC
- Grounds Building GB
- Henry Ford Estate HFE
- Kinderergarten Module KM
- Manufacturing Systems MS
- Mansfield Library ML
- Months Parking Structure MPS
- Professional Education PE
- Science Building SB
- Science Building / Control Sciences Building CSB
- Social Sciences Building SSB
- University Center UC

Fairlane Center; Room 120/121

FOR CAMPUS MAPS GO TO:
<http://www.umd.umich.edu/dept/faciplan/WebSite03/UMDcampusmap.html>