



Educational and Outreach

Xenofon Koutsoukos



Outline

- * Master of Engineering Degree Program in CPS
- * CPS Summer Camp'17

VANDERBILT



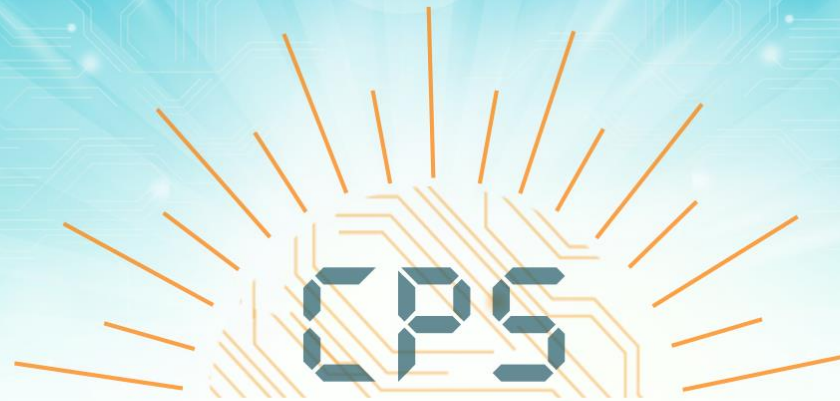
School of Engineering

CYBER-PHYSICAL SYSTEMS

Master of Engineering Degree Program

MEng in CPS

- * Program Director: Xenofon Koutsoukos (EECS)
- * Steering Committee
 - * Sankaran Mahadevan (CEE)
 - * Eric Barth (ME)
 - * Franz Baudenbacher (BME)
- * More than 25 faculty from four departments
- * Electrical Engineering and Computer Science
- * Civil and Environmental Engineering
- * Mechanical Engineering
- * Biomedical Engineering
- * CPS foundations (9 hours)
- * CPS Engineering (6 – 9 hours)
 - * Engineering Design of CPS
 - * Dependable and Trustworthy CPS
- * CPS Applications (6 - 9 hours)
 - * Embedded Systems
 - * Control Engineering
 - * Robotics
 - * Transportation Engineering
 - * Smart Health Care
- * Project Management and Leadership (3 hours)
- * Capstone Project (3 hours)



Summer Camp '17

July 31 - August 4

at Vanderbilt University Institute for Software Integrated Systems



VANDERBILT
UNIVERSITY®

Institute for Software
Integrated Systems




CPS Summer Camp'17

- * This summer camp took place at Vanderbilt University July 31st - August 4th. Invited participants were 15 MLK Jr Magnet School rising HS Seniors and Juniors.
- * The program provided a summer camp experience in Cyber-Physical Systems (CPS) for high-school students.
- * The goals of the program are to
 - * help students understand CPS
 - * increase diversity and interest in CPS
 - * improve teaching methods for delivering content in CPS curricula, and
 - * prepare students for related coursework in college.
- * The long-term goals of this initiative include establishing (or building) a pipeline that targets highly-qualified students who are interested in CPS-related engineering disciplines.

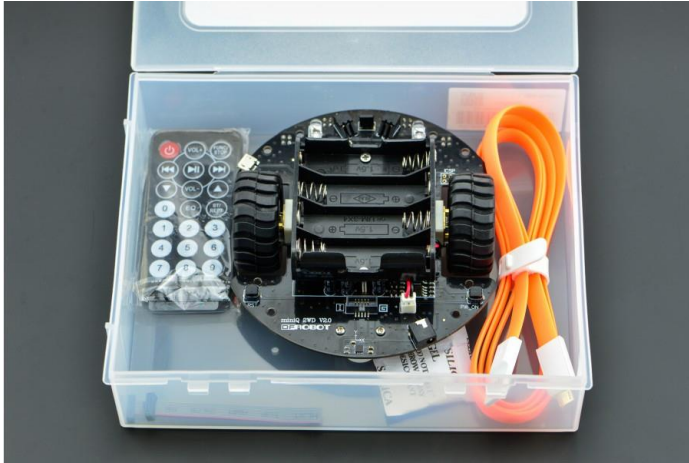


Schedule

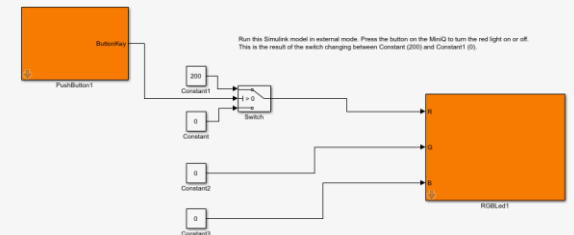
	Mon, July 31	Tues, Aug 1	Wed, Aug 2	Thurs, Aug 3	Fri, Aug 4
9:00-12:00	Introduction to CPS	Smart Cities	Networking	Unmanned Aerial Vehicles (drones)	Modeling and Simulation of Physical Processes
12:00-1:00	<i>catered lunch</i>	<i>catered lunch</i>	<i>catered lunch</i>	<i>catered lunch</i>	<i>catered lunch</i>
1:00-4:00	Intro to Matlab and wired control of MiniQ Lab Exercise #1	Intro to ArduinoIDE  (Tutorials 3-5) Lab Exercise #2a Intro to Simulink Lab Exercise #2b	ArduinoIDE Challenge Problem Lab Exercise #3a Optional Expansion Lab Exercise #3b	Capstone Design Project	1:00-2:00 -- Mechanical Engineering & CPS 2:00-3:00 -- Open House 3:00 -- 4:00 Closing Ceremony

Highlights

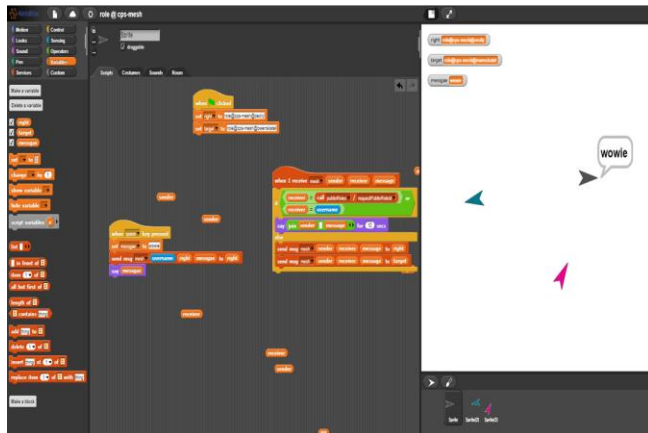
MiniQ



Kate's Story...with MatLab, SimuLink, Arduino, & MiniQ



Lillie's Experience...with NetsBlox



Cecily's Life Journey...with Python & Roomba

```
mathquiz.py
1 from os import system
2 from random import randint
3
4 #this say function is the most important part of kids programming
5 #it uses the built in OSX say command to convert text to speech
6 def say(something):
7     system('say "%s"' % something)
8
9 #how big a number should we guess?
10 max_number = 10
11 first_line = "Guess a number between 1 and %d" % max_number
12 print(first_line)
13 say(first_line)
14 number = randint(1, max_number)
15 not_solved = True
16
17 #keep looping until we guess correctly
18 while not_solved:
19     answer = input("?:")
20     you_said = "You typed %d" % answer
21     say(you_said)
22     if answer > number:
23         say("The number is lower")
24     elif answer < number:
25         say("The number is higher")
26     else:
27         say("You got it right")
28         not_solved = False
```

