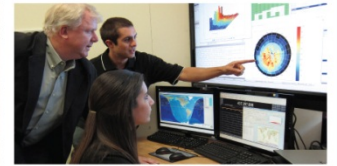


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Electrical Engineering

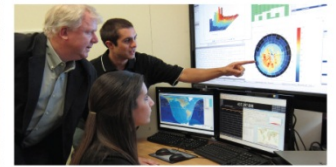
Katie Wilson
skwilson@scu.edu



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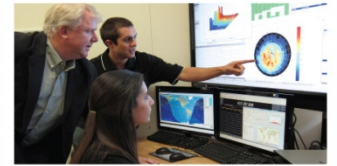




What is Electrical Engineering ?

Designing systems and components that use electricity.





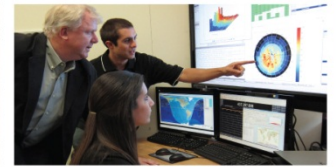
Where is electrical engineering ? Electronics



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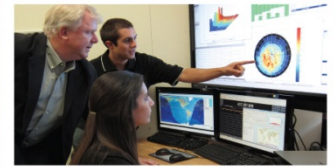
Where is electrical engineering ? Communications



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Where is electrical engineering ? Power and Energy

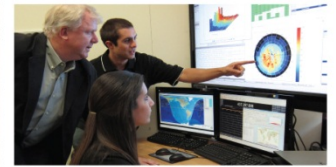


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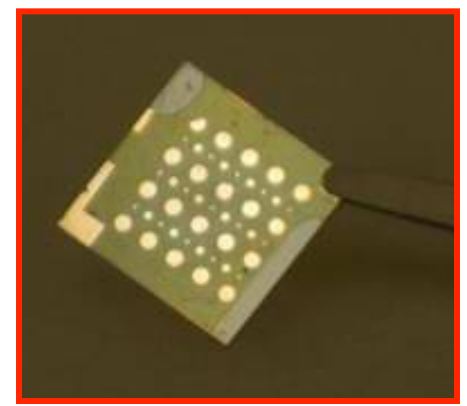
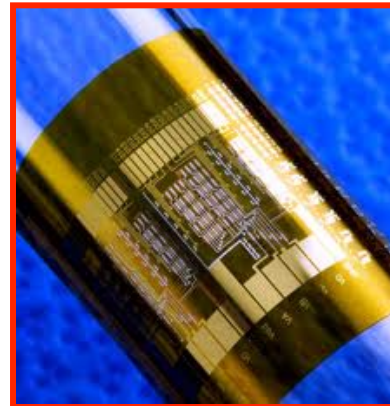
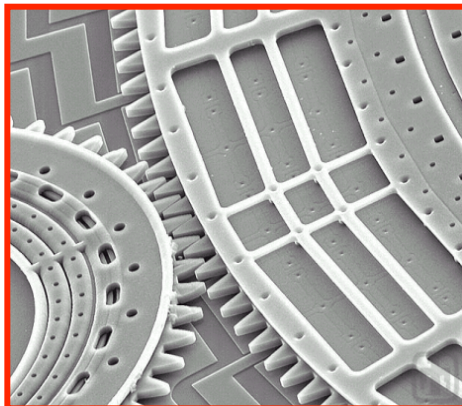
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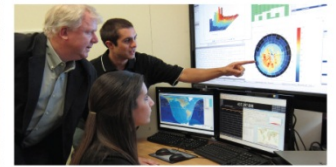
Where is electrical engineering ? Nanotechnology and Devices



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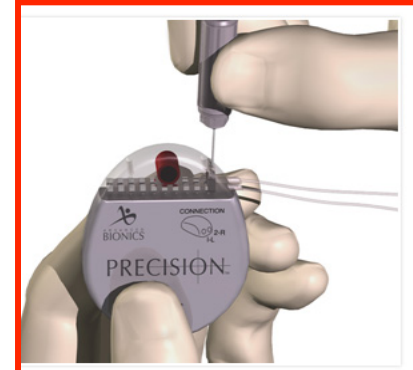
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Where is electrical engineering ?

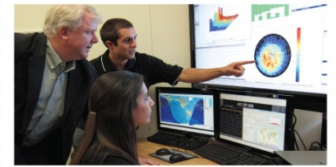
Medical Applications



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Where is electrical engineering ? Unusual places



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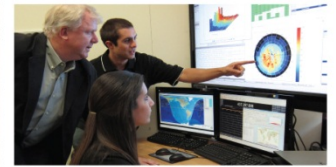


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Some example systems we use every day?



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Automobiles

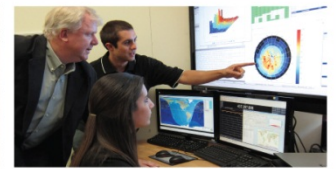
- Sensors
- Smart control
- Power



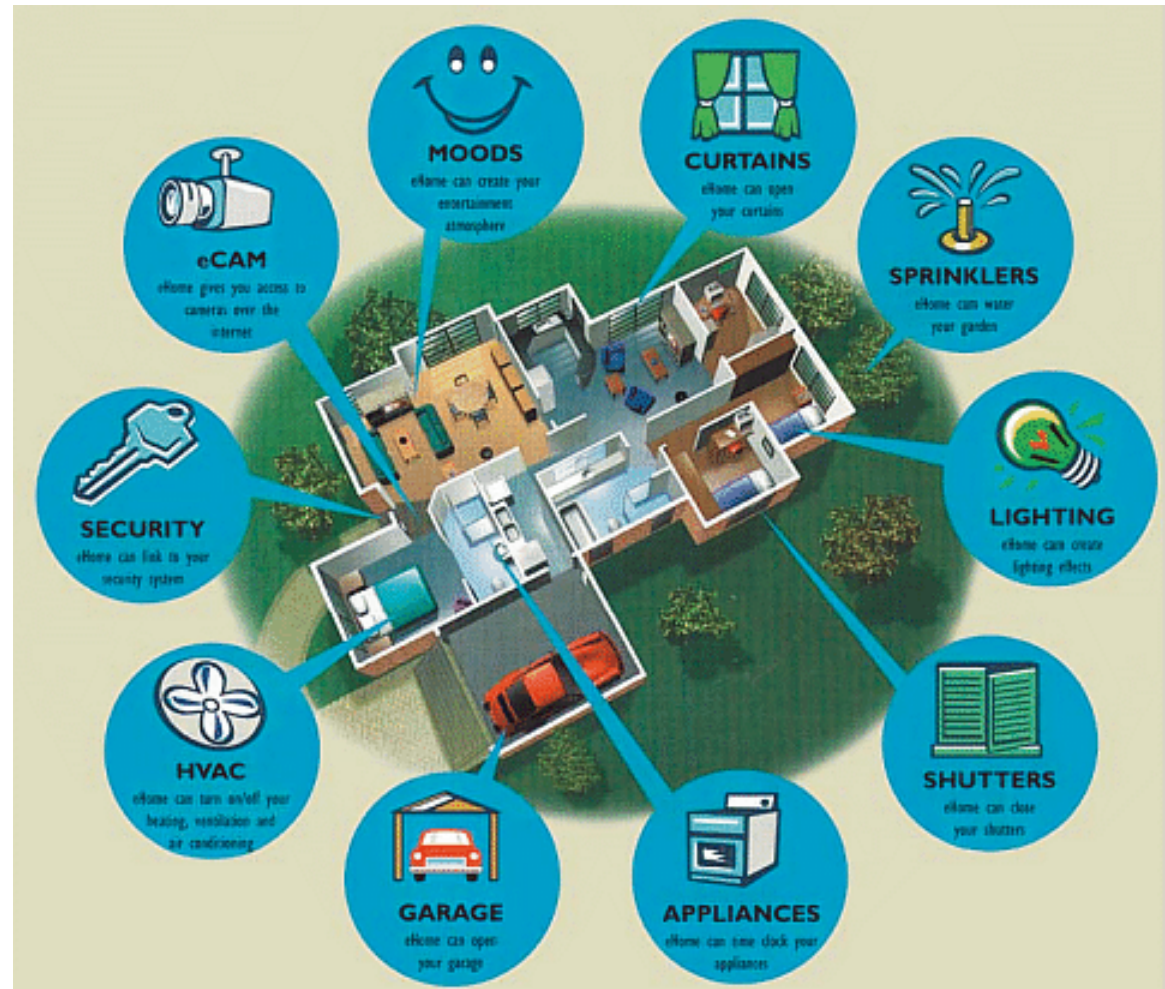
... options; 160, 230 and 300 miles. Pictured is Tesla's Model S beta prototype photographed at headquarters in Palo Alto. (Dai Sugano/Mercury News)

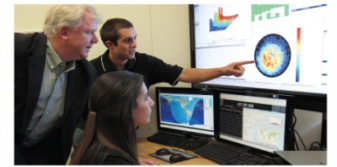


Tesla's Model S



Home Automation

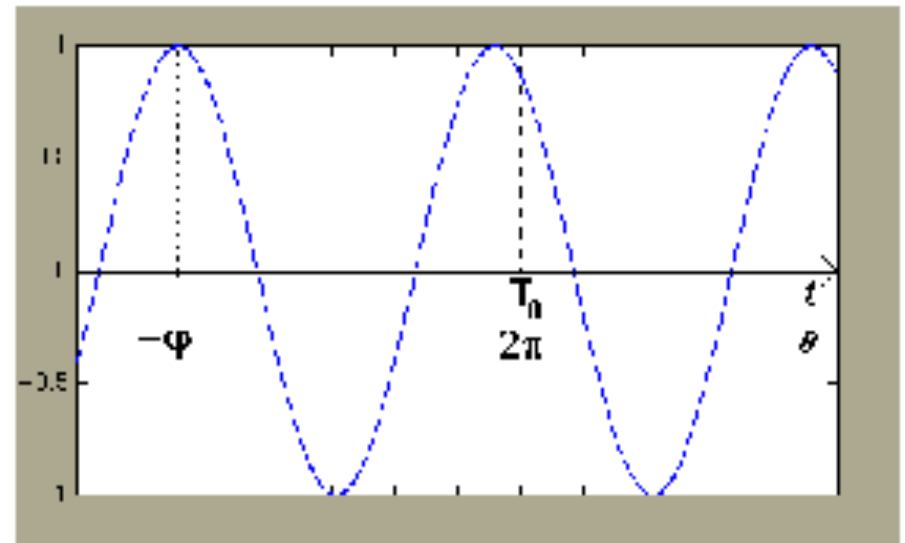


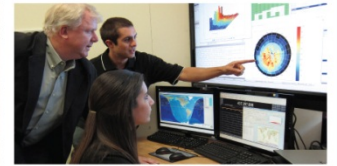


What are Electrical Signals

Oscillating waveform of voltage or current

Contains information to represent data

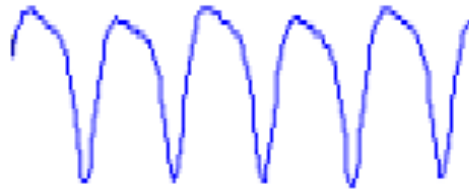




Flute



Louder Flute



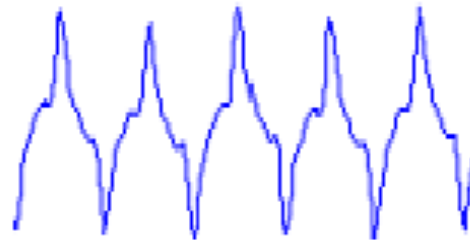
Higher Pitch Flute



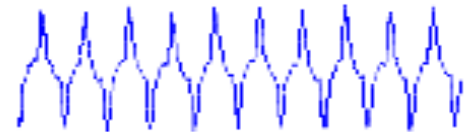
Clarinet



Louder Clarinet



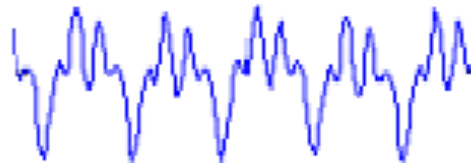
Higher Pitch Clarinet



Piano

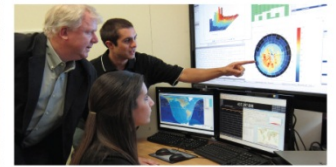


Louder Piano

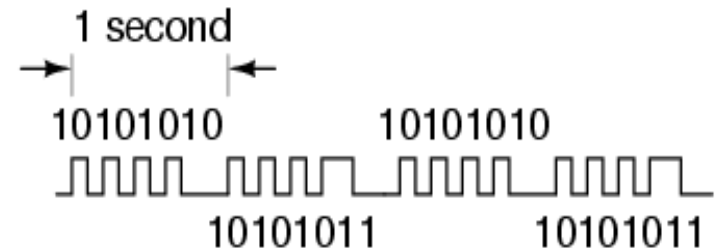
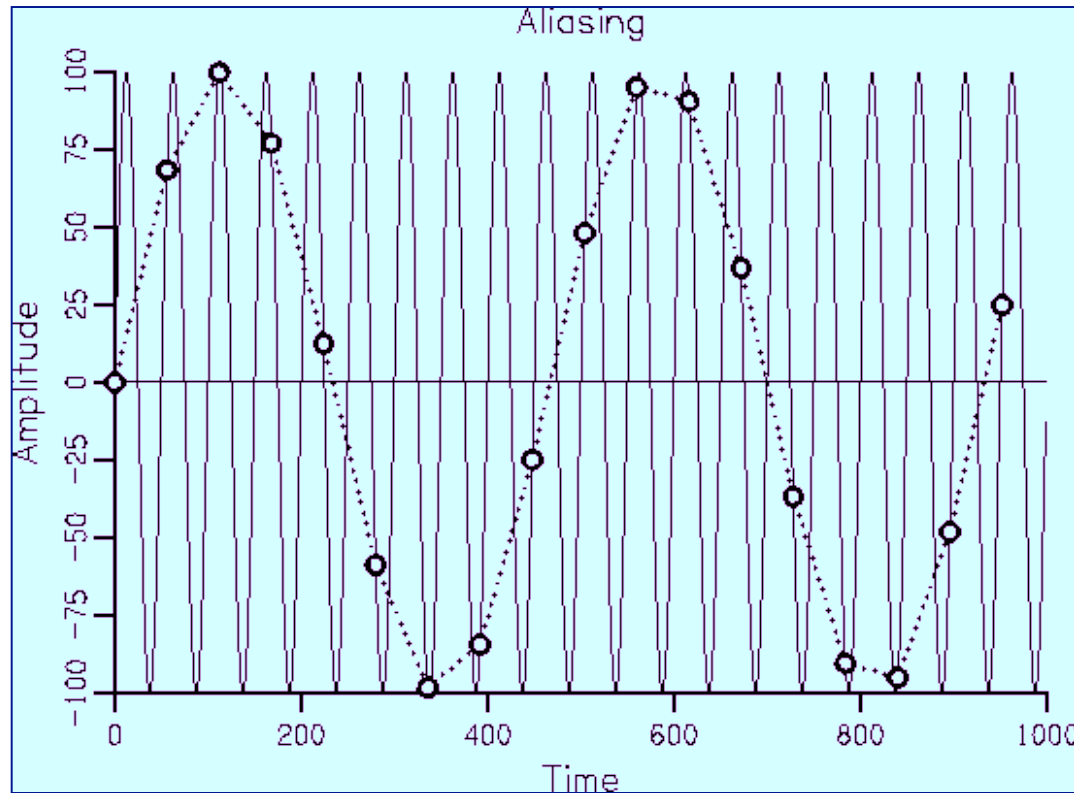


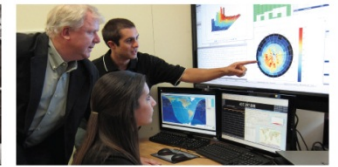
Higher Pitch Piano





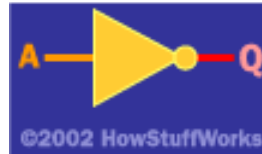
Making the Real World Digital





Digital Systems

Boolean algebra Logic gates



a	\bar{a}
0	1
1	0



a	b	$a \cdot b$
0	0	0
0	1	0
1	0	0
1	1	1

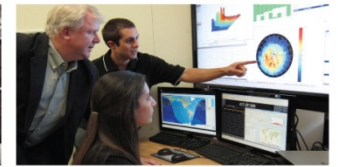


a	b	$a + b$
0	0	0
0	1	1
1	0	1
1	1	1



a	b	$a \oplus b$
0	0	0
0	1	1
1	0	1
1	1	0





Design Example

Hall Way Light

Any switch can turn the light off or on

Truth Table ?

Logic gate?

INPUT		OUT
A	B	
0	0	0
0	1	1
1	0	1
1	1	0

■ Test this out using simulation

■ XOR

■ Help save resources, time and effort before we actually build it

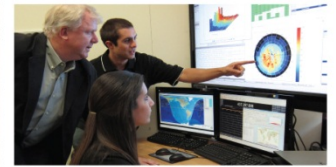


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Questions?
Lets go hands on !

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