COSMOS Educational Toolkit

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https://cosmos-lab.org/outreach

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*The COSMOS testbed design and deployment is joint work with the COSMOS team (www.cosmos-lab.org).
COSMOS Educational Toolkit

• Hardware components:
  • **Processing Units:** Intel NUC, Raspberry PI
  • **Software Defined Radio:** ADALM Pluto SDR, RTL-SDR
  • **IoT Nodes:** Arduino/Micro:bit, XBEE/BLE, sensors

• Software components:
  • **Web front-end interface:** HTML, CSS and Javascript
  • **Web back-end server:** Python
  • **SDR Software:** GNU Radio
  • **IoT management:** influxdB and Chronograf

*Fig:* Hardware components of the ‘COSMOS Educational Toolkit’
Program Overview (1/3)

a. **Lecture and lab phase:** The participants are introduced to fundamental and some advanced concepts in wireless communications and networking
   
   • $8K stipend for summer

b. **Design phase:** The participants conduct research on potential educational NGSS STEM lessons with a hands-on wireless labs using the ‘COSMOS Educational Toolkit’

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*Fig:* Participants attend an instructor-led lesson using the ‘COSMOS Educational Toolkit’

*Fig:* Participants conduct research using sensors
Program Overview (2/3)

c. **Development phase:** teachers co-develop with the researchers their best ideas on how to use the wireless labs for NGSS-aligned STEM lessons.

d. **Implementation phase:** teachers and students use the developed lessons in the class during the school year.

**Fig:** Teachers present their developed NGSS lesson plans at Silicon Harlem

**Fig:** Middle school students using the ‘COSMOS Educational Toolkit’ in a Mathematics Class.
Program Overview (3/3)

e. **Feedback phase:** teachers provide feedback in order to improve the NGSS STEM lessons and develop new ones

**Fig:** Teachers present the PD Program and the developed NGSS Lesson Plans at the NE-ASTE Conference 2018
Conclusion

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