



BEAVER WORKS
Lincoln Laboratory | School of Engineering



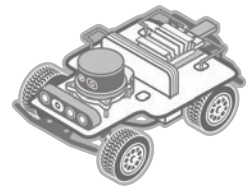
MIT Beaver Works Summer Institute

Spring 2021 Outreach Program – 7 Courses

Yes! You Can Program Autonomous Cars!

Yes! You Can Build CubeSats!

Yes! You Can Hack and Code!



Yes! You Can Do Synthetic Aperture Radar!

Yes! You Can Create Accessible Resources for Education!

Yes! You Can Design, Build and Fly Model Aircraft!

Many Interesting Things for Aspiring Engineers!

**No Prior
Experience
Required!**

WHO: High School Students (9th and 10th grade)

WHEN: Saturdays 11am-2pm (EST)-March 6, 13, 20, 27,
April 3, 10, 17, 24, 2021

WHERE: Virtually, through Zoom!

REGISTER: https://mit-bwsi.formstack.com/forms/bwsi_spring_2021

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YES! YOU CAN PROGRAM AUTONOMOUS CARS!

**NO
HARDWARE
REQUIRED!**

**A BWSI MINI-RACECAR
CRASH COURSE**

No Cost!



**LEARN TO CODE
PYTHON!**



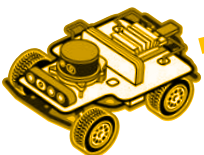
**NO PRIOR
EXPERIENCE
REQUIRED!**

Who: High School Students (9th and 10th grade) interested learning about coding and robotics! Beginners encouraged!

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Yes! You Can BUILD CUBESATS !

A BWSI CubeSat Crash Course

Interested in space?
Would you like to build a prototype satellite?



WHO: High School Students (9th and 10th grade) interested in learning about satellites! Beginners encouraged! (No coding experience needed).

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YES! YOU CAN HACK AND CODE!

MITRE Project

A BWSI EMBEDDED
SECURITY CRASH COURSE

**CAPTURE
THE FLAG**

**CYBER
COMPETITION!**

No Cost!



```
char release_message[1025];  
// get release message  
for (int i = 0; i < release_message_length; i++) {  
    release_message[i] = uart_read(UART1, BLOCKING, &read);  
    comboMetadata[54+i] = release_message[i];  
}
```

```
// Create 32 bit word for flash programming, version is 0x00000000  
uint32_t metadata = ((size & 0xFFFF) << 16) | (version & 0xFFFF);  
program_flash(METADATA_BASE, (uint8_t*)&metadata, 4);  
fw_release_message_address = (uint8_t *) (FW_BASE + size);
```

**LEARN TO CODE
PYTHON!**

**NO PRIOR
EXPERIENCE
REQUIRED!**

Who: High School Students (9th and 10th grade) interested in learning about code and hacking! Beginners encouraged!

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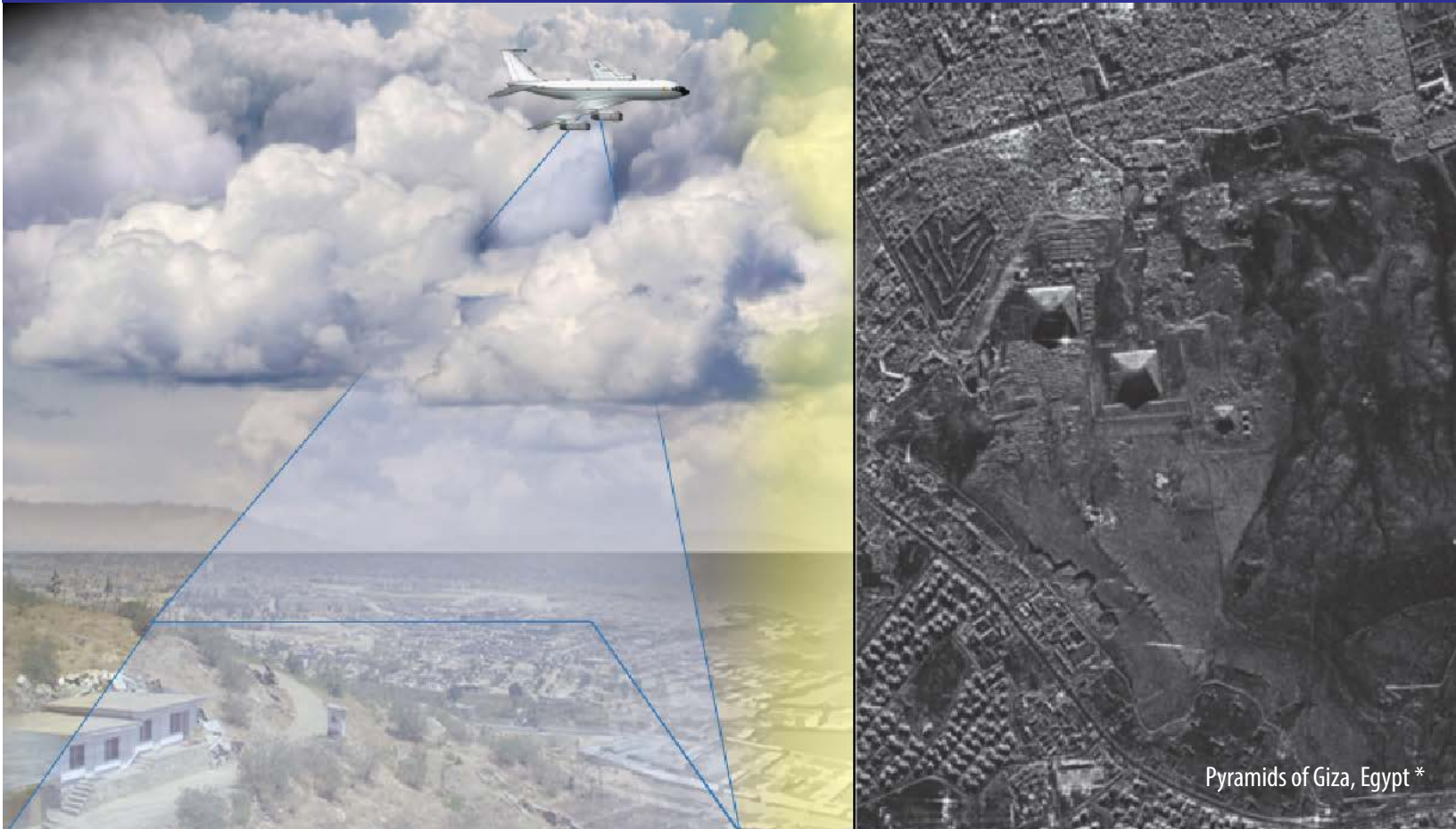


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Yes! You Can Do Synthetic Aperture Radar!

A BWSI Synthetic Aperture Radar Crash Course



Learn the mathematics and engineering behind Synthetic Aperture Radar imaging used to image the Earth for many applications such as environmental change monitoring by NASA!

You will have the opportunity to create your own SAR images from images of your choice!

* https://www.dlr.de/rd/en/desktopdefault.aspx/tabid-4824/7998_read-10118/7998_page-2/gallery-1/216_read-3/

No Prior Experience Required!

Who: High School Students (9th and 10th grade) interested applying engineering and programming skills to translate theory into practice.

When: Saturdays 11am-2pm (EST) - March 6, 13, 20, 27, April 3, 10, 17, 24, 2021

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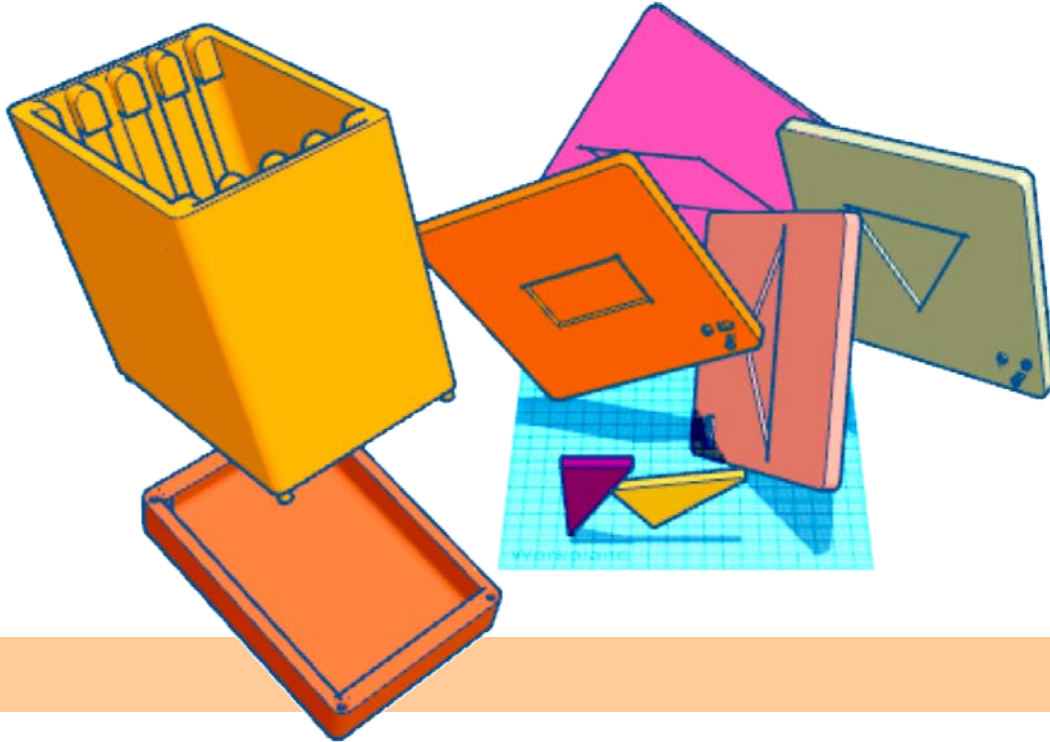


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Yes! You Can Create Accessible Resources for Education!

A BWSI Designing for Assistive Technology Crash Course



Use computer-aided design (CAD) to create a unique 3D-printed puzzle box that can help teach concepts to children who are blind, have learning disabilities, or just enjoy learning with physical objects!

Your puzzle box will be 3D printed and donated to a local special education partner and featured on a website for others to use!

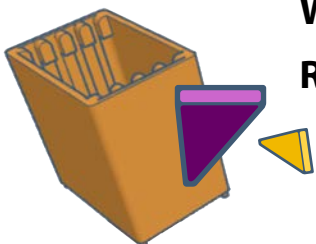
No Prior Experience Required!

Who: High School Students (9th and 10th grade) interested in learning how to apply engineering skills to help others get access to resources.

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Yes! You Can Design, Build and Fly Model Aircraft!

**Design
Build
Fly
Crash
Rebuild**

A
BWSI
(Beaver Works
Summer Institute)
Course

Introduction to RC Model Aircraft Design

**No Prior
Experience
Required!**

Who: Open to 9th and 10th grade students interested in Aerospace and Aeronautics.

When: Saturdays 11am-2pm (EST) - March 6, 13, 20, 27, April 3, 10, 17, 24, 2021

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Many Interesting Things for Aspiring Engineers

A BWSI course by Christian Cardozo

An early introduction to the
technologies that shape our world.

Python • Computer Architecture • Machine Learning
Computer Vision • Linux • The Internet

No prerequisites.
No pressure.

**NO PRIOR
EXPERIENCE
REQUIRED!**

WHO: High School Students (9th and 10th grade)
interested in learning about electronics, computers, and code.

WHEN: Saturdays 11am-2pm (EST)-March 6, 13, 20, 27,
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