

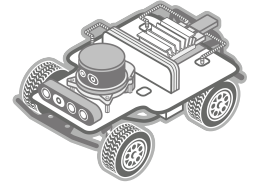
**BEAVER WORKS**  
Lincoln Laboratory | School of Engineering



# MIT Beaver Works Summer Institute

Fall 2023 Outreach Program – 6 Courses

Girls Who Program Autonomous Cars



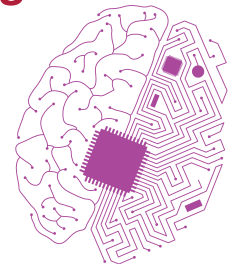
Girls Who Program Cognitive Assistants

Girls Who Want to Learn Many Interesting Things

Girls Who Design, Build and Fly Model Aircraft

Girls who want to learn Back to bASICs

Girls Who Program Racing Drones



**No Prior  
Experience  
Required!**

**WHO:** High School 10th and 11th Grade Female Students \*

**WHEN:** Saturdays 11am–2pm (EST) – October 14, 21, 28,  
November 4, 11, 18, December 2, 9 2023

**WHERE:** Virtually, through Zoom!

**REGISTER:** [https://mit-bwsi.formstack.com/forms/bwsi\\_fall2023](https://mit-bwsi.formstack.com/forms/bwsi_fall2023)

\* While all BWSI programs are open to eligible students of any gender identity this fall program is designed to encourage and support female students in STEM.

 **LINCOLN LABORATORY**  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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**DoDSTEM**  
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Patrick J McGovern  
FOUNDATION



**School of Engineering**

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# GIRLS WHO PROGRAM AUTONOMOUS CARS

## A BWSI MINI-RACECAR CRASH COURSE

## A BWSI MINI-RACECAR CRASH COURSE

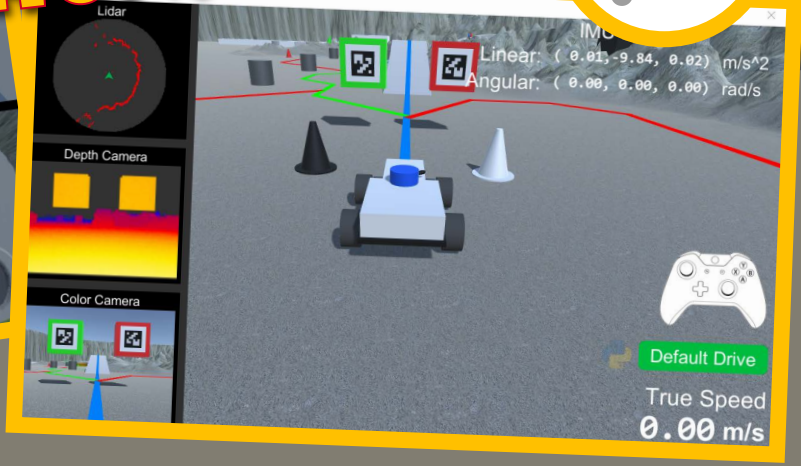
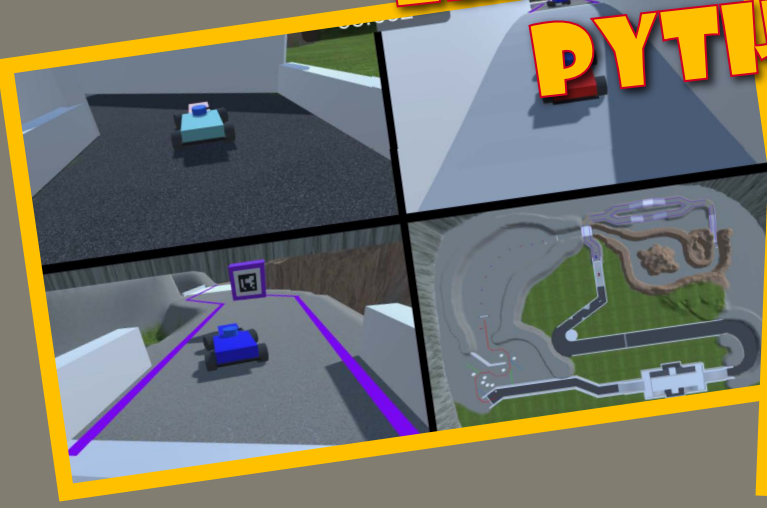
# NO HARDWARE REQUIRED!



# NO COST!



# LEARN TO CODE PYTHON!



# NO PRIOR EXPERIENCE REQUIRED!

**Who:** Female High School Students (10th and 11th grade) interested learning about coding and robotics! Beginners encouraged!

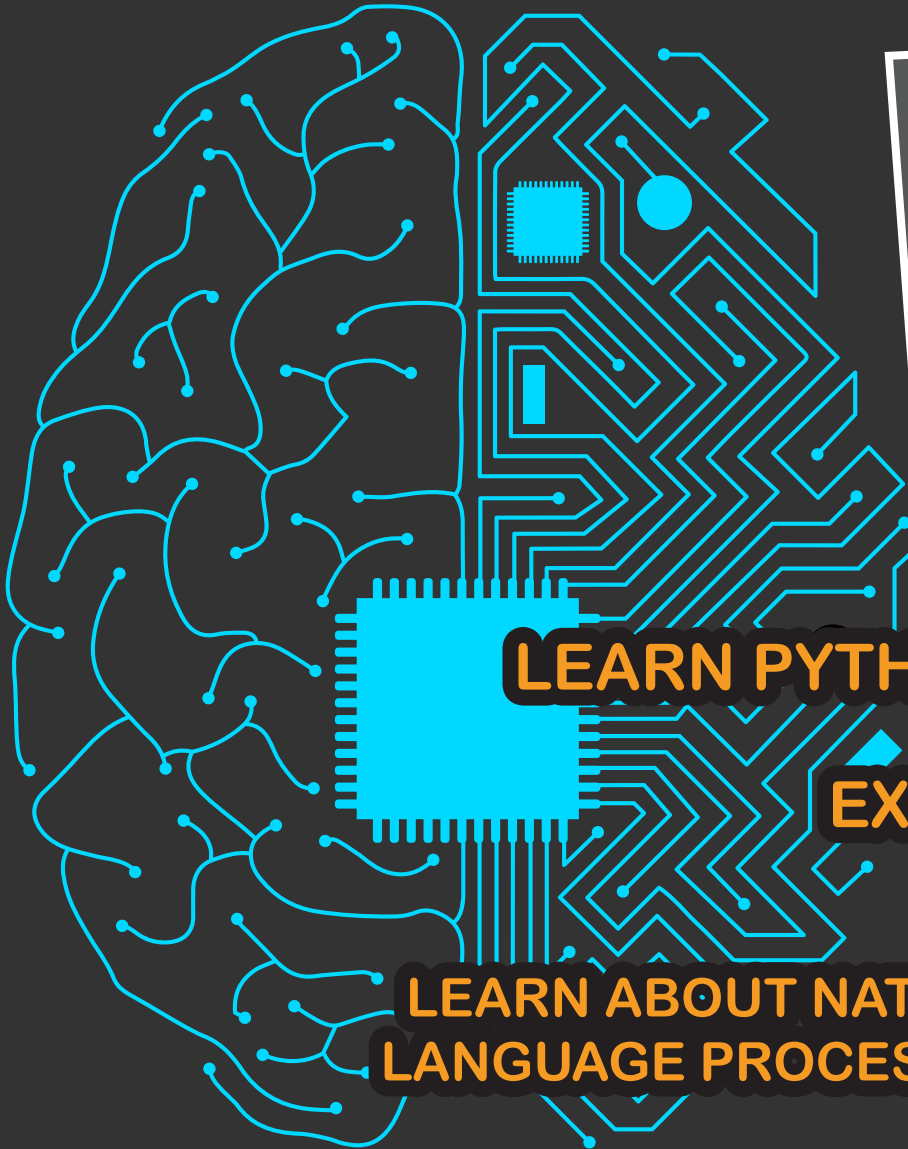
**When:** Saturdays 11am-2pm (EST) – October 14, 21, 28, November 4, 11, 18, December 2, 9 2023

**Where:** Virtually, through Zoom!

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# **Girls** who program cognitive assistants! — a BWSI crash course



**An introduction to artificial intelligence through building an autonomous cognitive assistant!**

**LEARN PYTHON!**

**EXPLORE MACHINE LEARNING!**

**LEARN ABOUT NATURAL LANGUAGE PROCESSING!**

**No Prior Experience Required!**

**Who:** Female High School Students (10th and 11th grade) interested in learning about code and artificial intelligence! Beginners Encouraged!

**When:** Saturdays 11am-2pm (EST) – October 14, 21, 28, November 4, 11, 18, December 2, 9 2023

**Where:** Virtually, through Zoom!

**Registration Form:** [https://mit-bwsι.formstack.com/forms/bwsι\\_fall2023](https://mit-bwsι.formstack.com/forms/bwsι_fall2023)



# Many Interesting Things:

For Aspiring Engineers  
From Transistors to Data Science

A BWSI Medlytics intro course by Christian Cardozo

An early introduction to the technologies that shape our world,  
with applications to medical data analytics!

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

No prerequisites.  
No pressure.

**NO PRIOR  
EXPERIENCE  
REQUIRED!**

**WHO:** Female High School Students (10th and 11th grade)  
interested learning about computers, coding and  
medical data analytics. Beginners Encouraged!

**WHEN:** Saturdays 10am-1pm (EST) – October 14, 21, 28,  
November 4, 11, 18, December 2, 9 2023

**WHERE:** Virtually, through Zoom!

**REGISTER:** [https://mit-bwsi.formstack.com/forms/bwsi\\_fall2023](https://mit-bwsi.formstack.com/forms/bwsi_fall2023)





# Girls Who Design, Build and Fly Model Aircraft — A BWSI Crash Course.

**Design  
Build  
Fly  
Crash  
Rebuild**



## Introduction to RC Model Aircraft Design

**No Prior  
Experience  
Required!**

**Who:** Female High School Students (10th and 11th grade) interested in Aerospace and Aeronautics.

**When:** Saturdays 11am-2pm (EST) – October 14, 21, 28, November 4, 11, 18, December 2, 9 2023

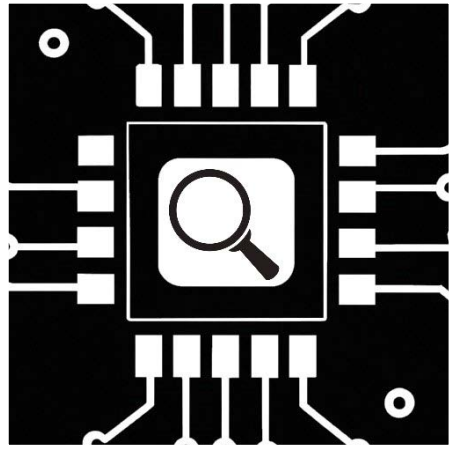
**Where:** Virtually, through Zoom!

**Registration Form:** [https://mit-bwsi.formstack.com/forms/bwsi\\_fall2023](https://mit-bwsி.formstack.com/forms/bwsi_fall2023)





# Girls who want to learn Back to bASICs



Beaver Works Summer Institute will offer a brand-new course on open source semiconductor design and fabrication. Students will receive hands-on experience on how to design and arrange semiconductors on a nanometer scale to perform a specific function.

makerchip PROJECT TUTORIALS HELP

EDITOR NAV-TLV LOG

```

@1
Saa_sq[7:0] = Saa[3:0] ** 2;
Sbb_sq[7:0] = Sbb[3:0] ** 2;
@2
Scc_sq[8:0] = Saa_sq + Sbb_sq;
@3
Scc[4:0] = sqrt($cc_sq);

```

TUTORIAL-VALID

calc

Figure 1: Pipelined Pythagorean Theorem Logic

This pipeline is 3 cycles deep. It has a throughput of one transaction per cycle, where a transaction performs one Pythagorean Theorem calculation per cycle.

SILWIZ

Legend: p substrate, n well, n diffusion, p diffusion, p tap, n tap, polysilicon, mim capacitor, metal2 via, metal2

Undo Redo Load Save Clear STL Preset

WAVEFORM

ZOOM IN ZOOM OUT ZOOM FULL

Signal	0	1	2	3	4	5	6	7	8
@0\$aa	0	1	2	3	4	5	6	7	8
@0\$bb	2	3	4	5	6	7	8	9	0
@1\$aa_sq	00	01	04	09	16	25	36	49	64
@1\$bb_sq	04	09	16	25	36	49	64	81	100
@2\$cc_sq	0000	0009	0016	0025	0036	0049	0064	0081	0100
@3\$cc	00	01	02	03	04	05	06	07	08

**NO PRIOR  
EXPERIENCE  
REQUIRED!**

**Who:** Female High School Students (10th and 11th grade) interested in learning about semiconductor design and fabrication! Beginners encouraged!

**When:** Saturdays 11am–2pm (EST) – October 14, 21, 28, November 4, 11, 18, December 2, 9 2023

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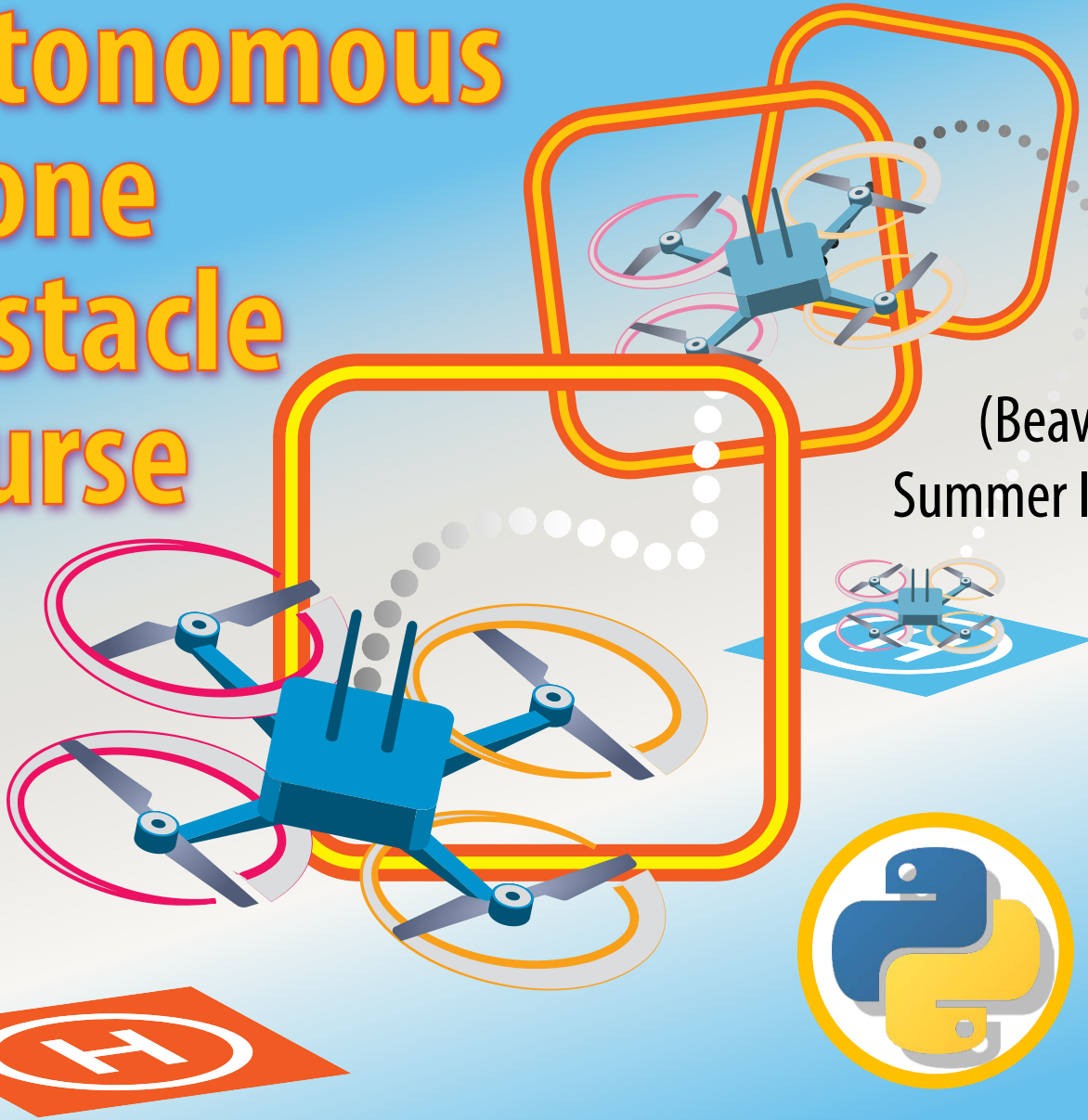


BEAVER WORKS  
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# Girls Who Program Racing Drones *Beaver Warrior*

## Autonomous Drone Obstacle Course



A  
BWSI  
(Beaver Works  
Summer Institute)  
Course



Learn  
to Code  
Python

### No Prior Experience Required!

**Who:** Female High School Students (10th and 11th grade) interested in Aerospace and Aeronautics.

**When:** Saturdays 11am–2pm (EST) – October 14, 21, 28, November 4, 11, 18, December 2, 9 2023

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