

How to CAD (and VR) Almost Anything!

IAP 2026 – AeroAstro Workshop

A compressed yet rewarding introduction to the parametric design software [Inventor](#) and game engine software [Unity](#), for beginners (no experience at all) and pro-users alike. Come learn how to CAD (computer-aided design) and VR (virtual reality)-visualize essentially almost anything!



Yes, this could be YOU at the end of the workshop! You'll be equipped with the tools to design cool looking objects such as Spaceship Earth, a Scream Canister, a Green Alien, a Locomotive, a Mickey mug, and even a Luxo Jr. Lamp! These are all projects from the Summer 2025 "[How to CAD Almost Anything! – Disney Edition](#)".

Workshop Details

Subject Title: How to CAD (and VR) Almost Anything!

Prerequisites: Willingness to have fun and think outside the box!

Enrollment: 20.

Attendance: Participants must attend all sessions.

Meeting Rooms: CAD Sessions: [GIS & Data Lab](#) (first floor of the Rotch Library, 7-238).
VR Sessions: 17-130 (The Hangar).

Meeting Times: CAD Sessions (6): Tuesdays (T) and Thursdays (Th), 3pm – 5pm, on 01/13 (T), 01/15 (Th), 01/20 (T), 01/22 (Th), 01/27 (T), and 01/29 (Th).
VR Sessions (2): Wednesdays (W), 4pm – 7pm, on 01/21 (W), 01/28 (W).

Instructors: Andy Eskenazi - AeroAstro PhD student (LAE), andyeske@mit.edu.
Mollie Johnson – AeroAstro PhD student (ESL), mojohn23@mit.edu.

About (Andy): Hailing from the capital of Tango, Steak and Football, Andy is currently a PhD student at MIT AeroAstro trying to make aviation more sustainable. Outside of research, he is passionate about all things mechanical design. At MIT, he has taught the "[How to CAD Almost Anything!](#)" series five times, on Solidworks (twice), Fusion 360, Onshape, Siemens NX, and now, on Inventor!

About (Mollie): Mollie Johnson is a PhD student in the Strategic Engineering Research Group within the Engineering Systems Laboratory, researching under Dr. Olivier de Weck. She obtained her BS in Aerospace Engineering from the Georgia Institute of Technology in 2023. Her experience with spacecraft operations has taken her from the Moon to Mars, where she did engineering operations for the Lunar Flashlight and science operations for the Curiosity rover. As a graduate student at MIT, she now focuses on the development and applications of augmented/virtual reality for uses in aerospace education.

Workshop Description

Ever wondered how are objects from our daily lives designed? How can we generate a computer 3D model of a classic iPod, a Play Station controller, or a LEGO Tower Bridge? What about designing the Taipei 101 tower? A banana? Or how about visualizing and interacting with these objects using VR? In this fun MIT IAP 2026 workshop, you will learn the skills to design and VR-visualize all of these, and much more!

Split into 8 (6 CAD, 2 VR) 2-hour long sessions, the first half of each session will be spent learning new Autodesk [Inventor](#) and VR skills, while the second half will see the application of these new skills through in-class activities, with a focus on reverse engineering. In contrast to traditional mechanical design courses, this workshop places greater emphasis on the design process itself, understanding how we can plan and best leverage our available tools to arrive to our desired result. Thus, the sessions are less about following the instructions on an engineering drawing, and more about independent thinking and strategizing, reverse engineering an object into a 3D model. New to this edition of "How to CAD" are 2 sessions that will go through the process of visualizing 3D models using VR!

Workshop Schedule

| # | Month | Day | Date | Outline and Objectives |
|---|-------|-----|-------|--|
| 1 | Jan | T | 01/13 | <p>Session 1: Introduction to Autodesk Inventor.</p> <p><u>Objective:</u> In this session, we'll get ourselves acquainted with the Autodesk Inventor workspace, and start learning some of the most used tools. S1's goals include:</p> <ul style="list-style-type: none">• Creating sketches (using basic shapes, construction lines, smart-dimensioning, sketch relationships) and understanding planes.• Understanding what it means for a sketch to be fully defined.• Locating and using the different elementary feature commands (boss extrude, boss cut, fillet, chamfer).• Editing sketches and features after creating them.• Coloring parts and changing material properties. <p><u>Session activity:</u> Using the tools learned on S1, we'll design a variety of items, including:</p> <ul style="list-style-type: none">• A first-generation Apple iPod Classic.• A first-generation iPod USB Power Adapter. |

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| | | | | Session 2: Splines, Sketch Pictures and logos! |
| 2 | Jan | Th | 01/15 | <p><u>Objective:</u> In this session, we'll continue exploring some of the most powerful Inventor tools. S2's goals include:</p> <ul style="list-style-type: none"> • Learning how to use the spline tool and project entities. • Learning how to add a picture and sketch on it. <p><u>Session activity:</u> Using the tools learned on S2, we'll design a variety of items, including:</p> <ul style="list-style-type: none"> • An MIT intramurals banner. • A keychain of your favorite sports team. |
| 2.5 | | Online Only | | <p>Session 2.5 (BONUS): Autodesk Inventor, I choose you!</p> <p><u>Objective:</u> In this session, we'll revise the contents learned during Session 1 and Session 2. S4.5's goals include:</p> <ul style="list-style-type: none"> • Revising some of the previously learned commands, including extrude, fillet, chamfer, sketch picture, and project entities. • Continuing to employ the "Master Sketch" technique. <p><u>Session activity:</u> We'll design a variety of items, including:</p> <ul style="list-style-type: none"> • A first-generation Nintendo Gameboy. • A Zapdos EX Pokémon Card (Scarlet & Violet 151). |
| 3 | Jan | T | 01/20 | <p>Session 3: All about symmetry, patterns and planes!</p> <p><u>Objective:</u> In this session, we'll focus our attention to symmetry, patterns and planes, and how we can leverage certain tools to simplify the design process. S3's goals include:</p> <ul style="list-style-type: none"> • Understanding how to create a sketch for a revolve. • Learning how to make use of the mirroring and circular patterns tools, both as a sketch and as a feature. • Learning how to create planes, at different angles. <p><u>Session activity:</u> Using the tools learned on S3, we'll design a variety of items, including:</p> <ul style="list-style-type: none"> • A tambourine. • A model of the Taipei 101 tower. |
| 3.5 | Jan | W | 01/21 | <p>Session 3.5: Entering the VR World, Part 1</p> <p><u>Objective:</u> In this session, we'll start work to visualize our CAD objects from S1 – S3 with VR using the software Unity. S3.5's goals include:</p> <ul style="list-style-type: none"> • Familiarizing ourselves with the Unity interface. • Learning how to transform objects from Inventor into a format suitable for VR. • Learning how to implement the open-source VR template. |

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| | | | Session 4: Sweeping through the courts! |
| 4 | Jan | Th | 01/22 |
| | | | <p>Objective: In this session, we'll explore two very powerful Autodesk Inventor tools, loft and sweep. This tool allows us to create complicated looking geometries, like the body of a 747 or the surface of an apple. S4's goals include:</p> <ul style="list-style-type: none"> • Learning how to use the loft and sweep commands. • Continuing to master previously explored tools, such as revolve, linear/circular patterns and plane creation. <p>Session activity: Using the tools learned on S4, we'll design a variety of items, including:</p> <ul style="list-style-type: none"> • A Play Station 1 controller. • A banana, in honor of the banana lounge (using various plane cuts, splines and lofts). |
| 4.5 | | Online Only | <p>Session 4.5 (BONUS): Let's have a 3D-modeled Coke!</p> <p>Objective: In this session, we'll revise the contents learned during Session 3 and Session 4 (+ the useful wrap). S4.5's goals include:</p> <ul style="list-style-type: none"> • Revising some of the previously learned commands, including loft, revolve, sweep, plane creations, patterns, filleting, and material properties. • Learning how to employ the wrap command (for engravings). <p>Session activity: We'll design a variety of items, including:</p> <ul style="list-style-type: none"> • A Coca Cola Light 150 ml can (with labels included). • A Star Wars X-wing fighter. |
| 5 | Jan | T | 01/27 |
| | | | <p>Session 5: Living in a world made from plastic bricks!</p> <p>Objective: In this session, we'll move towards one of the most powerful features within CAD parametric software, which is that of making assemblies! S5's goals include:</p> <ul style="list-style-type: none"> • Learning how to make an assembly of multiple parts. • Learning how to make an exploded view of an assembly and subsequently animating it. • Learning how to create an engineering drawing of a part and assembly (including exploded views). <p>Session activity: Using the tools learned on S5, we'll design a variety of items, including:</p> <ul style="list-style-type: none"> • A standard 2x4 LEGO block (as well as numerous others!). • A simple LEGO Tower Bridge assembly. • An engineering drawing of the bridge assembly and one of the LEGO bricks. |

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| | Session 5.5: Entering the VR World, Part 2 | | | |
| 5.5 | Jan | W | 01/28 | <p><u>Objective:</u> In this session, we'll continue work visualizing our CAD objects from S4 – S5 with VR. S5.5's goals include:</p> <ul style="list-style-type: none"> • Modifying parameters of the open-source VR template. • Learning how to use “grabbable” objects. |
| | Session 6: Variable Tables and Equations! | | | |
| 6 | Jan | Th | 01/29 | <p><u>Objective:</u> In this session, we'll investigate two often underappreciated yet extremely useful tools, parameter tables and equations/expressions. These tools allow the user to create various configurations of the same model, depending on specific needs. S6's goals include:</p> <ul style="list-style-type: none"> • Learning how to create equations/expressions and incorporate them into a design/parameter table. • Creating configurations of the same model. <p><u>Session activity:</u> Using the tools learned on S6, we'll design:</p> <ul style="list-style-type: none"> • An airplane economy seat (with multiple configurations). |