



# Read First: Simulation Ready Geometries- Sports Collection

Developed and curated by the Ansys Academic Development Team

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## Ansys Software Used

This resource uses Ansys Discovery™, the 3D product simulation software. Other software that are mentioned in the resource are Ansys Workbench™, the simulation integration platform, Ansys Fluent®, the fluid simulation software and Ansys HFSS™, the 3D high-frequency simulation software.

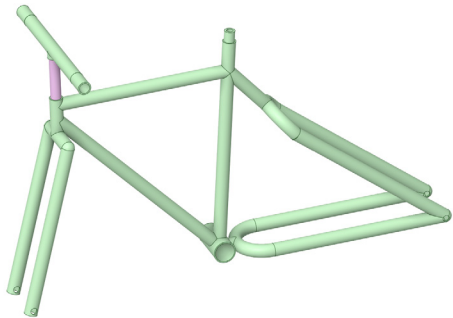
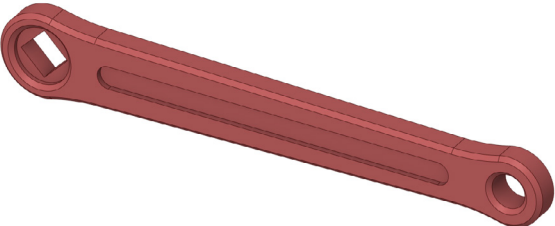
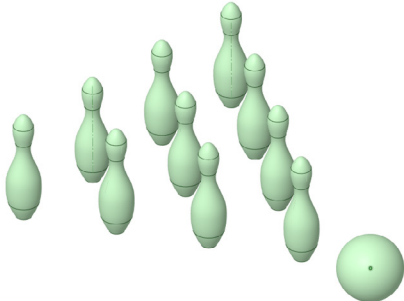
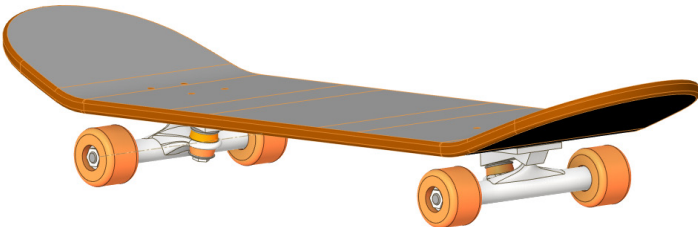
## Summary

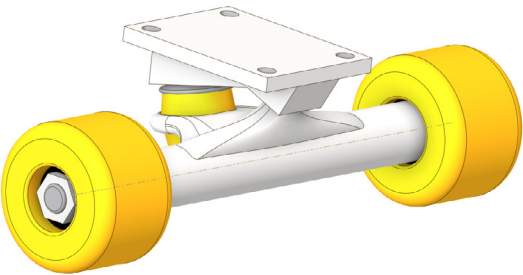

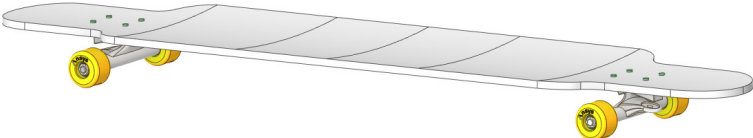
This resource is a collection of Ansys Discovery CAD models, focused on sports equipment. The goal of this resource is to provide a variety of ready-made CAD models for use in the classroom. Details of the models available, using the Ansys Discovery tool file format with other Ansys products such as Ansys Workbench software, and additional information can be found in this document.

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### 1. Geometries available in this collection

Geometry Name	CAD Image
Bike Frame	
Bike Crank	
Bowling Ball and Pins	
Skateboard	

Geometry Name	CAD Image
Simplified Truck (Skateboard)	
Football (Soccer Ball)	
Longboard	

## 2. The .dscf file format

In this collection you will find **nine** CAD models related to the **sports** field. Each model will be available in the **.dscf** file format.



Figure 1: Example CAD file (Disc brake) open in the Ansys Discovery software

This is the format of the new recommended tool (Ansys Discovery Software) for geometry editing and preliminary simulation (ready to simulate geometry). Models can be imported into Ansys Workbench tool and used with any Ansys software of preference

## 3. How to use the .dscf file in Ansys Discovery Software

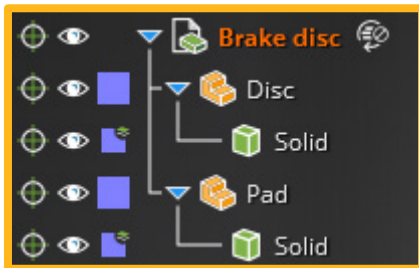


Figure 2: Model Tree in Ansys Discovery for the Disc brake

If any changes need to be made to the .dscf file, Ansys Discovery is the best tool to do this. There are two menus to highlight for quick model changes. We will use the Disc brake from Figure 1 for an example.

When open in Ansys Discovery tool, like in Figure 1, there is a **Model Tree** (Figure 2). This displays the individual parts of the model. For this example, there are two parts held within the containers called **Disc** and **Pad**.

The second drop down menu of importance is the **Physics Tree** (Figure 3). This is one of the places you can change the material used in the model. In this example, we can see cast iron EN GJL 100 is the material currently assigned to the disc brake.

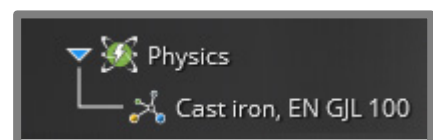


Figure 3: Physics Tree in Ansys Discovery for the Disc brake

## 4. How to open/insert and transfer .dscf files to Ansys Workbench

This section details how .dscf and other supported model formats can be opened in the Ansys Discovery software and then transferred to flagship Ansys products or Ansys Workbench Software.

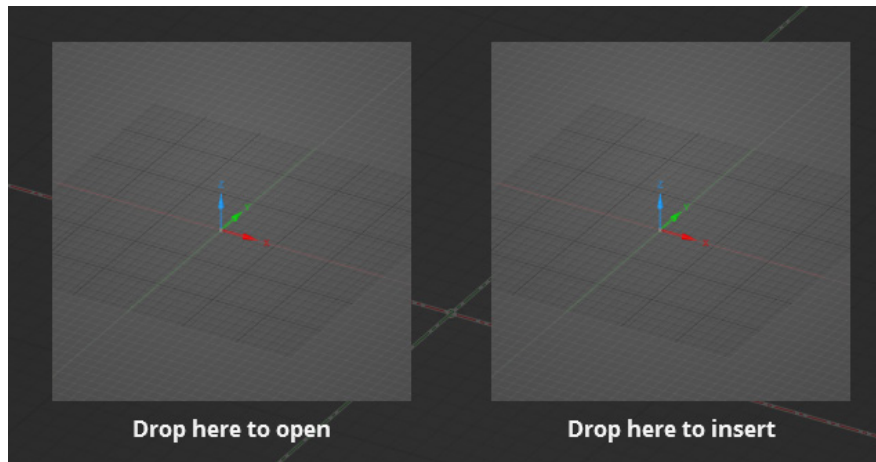


Figure 4: Insert window in the Ansys Discovery tool

.dscf files and other supported model formats can be opened by dragging and dropping files into a blank Ansys Discovery space. Use the Insert window (Figure 4) to include multiple models in the same space.

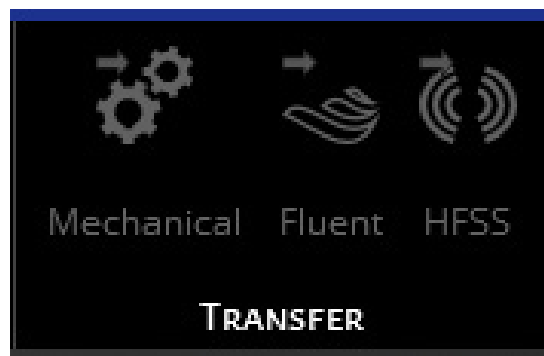


Figure 5: the Transfer Ribbon in Ansys Discovery Menu

To bring .dscf models into the flagship products (Ansys Mechanical tool, Ansys Fluent Software, Ansys HFSS Software), simply use the Transfer ribbon in Ansys Discovery tool(Figure 5) and click the product of interest.

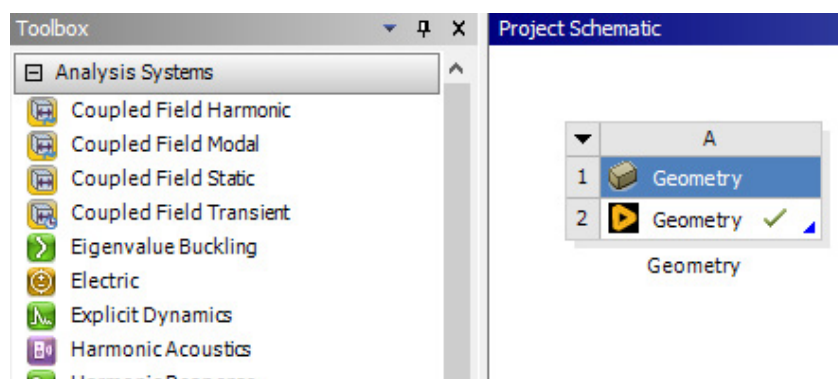


Figure 6: Ansys Workbench geometry file interface

Files can be opened in Ansys Discovery software using the Geometry cell in Ansys Workbench (Figure 6).

## 5. Links to Automotive CAD models

CAD Model Name	Link to Source
Bike crank	<a href="#"><u>Breakaway Bike Crank Design with Ansys Discovery AIC</u></a>
Bike frame	<a href="#"><u>Structures in Consumer Goods AIC</u></a>
Bowling ball & pins	<a href="#"><u>Contact Mechanics AIC</u></a>
Football	<a href="#"><u>Effect of Side Spin on a Soccer Ball using Ansys Fluent AER</u></a>
Longboard	<a href="#"><u>Case Study: Design of a Longboard AER</u></a>
Simplified Truck (Skateboard)	<a href="#"><u>Structural Design of a Skateboard AIC</u></a>
Skateboard	<a href="#"><u>Structural Design of a Skateboard AIC</u></a>

Some of the CAD models included in this package come from sources across Ansys, such as Ansys Innovation Courses (AIC), Ansys Education Resources (AER), or the Ansys Discovery forum. Links for those sources can be found here.

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## Document Information

This CAD model collection is part of a set of teaching resources to help introduce students to structures, fluids, or heat transfer (physics areas supported by Ansys Discovery Software).

## Ansys Education Resources

To access more undergraduate education resources, including lecture presentations with notes, exercises with worked solutions, microprojects, real life examples and more, visit [www.ansys.com/education-resources](http://www.ansys.com/education-resources).

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