

Zürcher Hochschule der Künste Bachelor of Arts in Design

# Bits & Atoms Computer Aided Design

#### 3rd Semester | 10th of October 2018

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#### Overview **Bits & Atoms: Computer Aided Design**



**Rhino Basics** 



Rhino to Grasshopper

Parametric **Design** with Grasshopper







Overview Grasshopper

Grasshopper is a visual programming language and environment developed by David Rutten at Robert McNeel & Associates, that runs within the Rhinoceros 3D computer-aided design (CAD) application. The first version of Grasshopper was released in September 2007, and titled Explicit History. Grasshopper has become part of the standard Rhino toolset in Rhino 6.0 and later.



#### Grasshopper

- Grasshopper is primarily used to build generative algorithms, such as for generative art. Many of Grasshopper's components create 3D geometry.
   Advanced uses of Grasshopper include parametric
- Advanced uses of Grasshopper include parametric modelling for structural engineering, parametric modelling for architecture and fabrication, lighting performance analysis for eco-friendly architecture and building energy consumption.



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#### **Component Panels (Container System)**



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**Component Panels (Container System)** 

and you will see a list of parameters or components that match your request.

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## You can also find components by name, by double-clicking anywhere on the canvas; launching a pop-up search box. Type in the name of the component you are looking for





**Component Panels (Container System)** 

components are then connected to the inputs of subsequent components.



## - The program gets created by dragging components onto a canvas. The outputs to these



### Overview Component Panels (Container System)















**Component Panels (Container System)** 

## <u>Parameters</u> contain data, meaning that they <u>store</u> stuff. <u>Components</u> contain actions, meaning that they <u>do</u> stuff.





**Component Panels (Container System)** 

When you hover your mouse over the individual parts of a Component object, you'll see different tooltips that indicate the particular type of the (sub)object currently under the mouse. Tooltips are quite informative since they tell you both the type and the data of individual parameters:

Div. C (Curve)
Curve to divide
Local Curve list (1 values) Referenced Curve
Div. N (Integer)
Number of segments
Local Integer list (1 values) 10
Div.K (Boolean)
Split segments at kinks
Local Boolean list (1 values)





**Component Panels (Container System)** 

All objects on the Canvas have their own context menus that expose most of the features for that particular component.

**Right click on the Parameter or Component indicates** those features:

The space button shows the same features in symbols:



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	John Dake	
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	Wire Display	
	Reverse	
	Flatten	
	Graft	
	Simplify	
	Expression	
	Set one Point	
	Set Multiple Points	
	Manage Point collection	
	Clear values	
	Internalise data	
	Extract parameter	
	Help	









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# Thank you

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