# McNeel Europe

**European division of Robert McNeel & Associates**

## Grasshopper Fundamental Training and Hands-On Workshop

Rhinoceros users are invited to Barcelona for a three-day intensive Grasshopper workshop. Participants in the workshop will be guided through the details of this visual programming plug-in within Rhino, including understanding parameters, volatile data, referencing, and functions in order to extend Rhino's functionalities for personal and professional applications. Finally, we will have time to explore user's own proposals on the third day.

**Structure**

This training will accompany designers into conceiving new shapes with generative algorithms. We will start with a theoretical and functional understanding of the graphical algorithm editor, and then dive into more complex parametric models. We'll also learn tricks to keep our project responsive and enjoyable to use. This class will begin by getting users acquainted with the plug-in interface within Rhino. We will cover a large geometrical base, building through vectors, points, curves, meshes and surfaces in order to achieve an understanding of the potential of working with Grasshopper.

**Outcomes**

After this course, the participants are expected to be able to:

- Understand how to compose, edit, and execute definitions
- Quickly identify and correct common bugs that can prevent definitions from running
- Have a concrete working knowledge of common visual programming patterns
- Understand the resources available and how to find information when needed

**Target Audience**

This course is intended for existing Rhino users that have completed Level 1 training or have a good working knowledge of the Rhino modeling environment.

**Prerequisite**

Rhinoceros v4 SR7 (most recent)
Grasshopper, latest WIP version (available from www.grasshopper3d.com )
To make the most of the three day workshop, it is highly recommended that participants survey the available Grasshopper primer resources on the web, such as Andrew Payne and Rajaa Issa's "Grasshopper primer second edition", prior to arriving in Barcelona for the workshop.

**Outline**

- An understanding of the Grasshopper interface and the visual programming theory
- Base parameters, large numbers of points and vectors, and small geometrical instances
- Data flow: volatile and permanent data
- Troubleshooting definition problems and solutions
- Know the main component types
- Be able to join, and manage connections and comprehensively understand data trees
- Expressions for both calculation and Boolean logic
- Understand Data Matching and casting
- Managing long lists of objects within Grasshopper
- Have an understanding of the functioning of Grasshopper components
- Parametric geometry examples, like attractors and list culling
- Re-utilizable modeling examples: colored panelization, surface population, gradient and picture sampling and manipulation, catenary line and weaving
- Spline animation examples
- Getting ready to prepare own definitions, alone and in groups while keeping projects responsive

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