Chapter 1

Introduction

Presentation

With DR. GEO you create geometrical sketches then you manipulate them interactively according to their geometrical constraints. It offers also the possibility to be acquainted to programming. It is usable in teaching situations from the primary level to the upper level.

Its user interface is designed to ally in a harmonious set simplicity of use and advanced features.

The DR. GEO user interface, under an appearance of very big simplicity, allows the beginner to get acquainted very quickly with the basic functions of the software. Then, during his progress, the user will discover more advanced aspects of the interface and the functioning of DR. GEO: multiplicity in the mode of construction[1] macro-construction, multiple recording, script, Smalltalk sketch, inheritance of Smalltalk in DR. GEO. These advanced features generate not much overload on the interface, that is why DR. GEO is very pleasantly used in primary education, however it is also very interesting for the high school and college.

In the following sections, we explain the basic tools. Then the advanced features are presented in detail.

The layout of the interface is as follows :

1. *menu bar* with: `File` – `Points` – `Lines` - `Transformations` – `Numerics` – `Animate` – `Macro-construction` ,

2. one *edition toolbar* to select and move an object, to modify its style, to undo/redo actions, to erase an object, to show the xy-axis and to magnetise the editions,

3. one *construction toolbar*, it groups in several tabs the tools to construct objects, it is the same as the menu bar,

4. in the right bottom corner, two wheels to move horizontally and vertically the sketch,

5. in the right top corner, a wheel to scale the sketch.

To create a new sketch, the user goes in the menu `File->New` . For each new sketch, a distinct window opens with its own menu and toolbar.

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[1]With the same command, it is about creating a an object with different parameters. For example with the command construction of a circle, the user can create a circle defined by its centre and a point or a length, etc. Of course this command is represented only by one button, DR. GEO anticipates the construction of the user. The immediate effect is thus a decrease of the cognitive load in the user interface, while proposing a significant number of modes of construction.
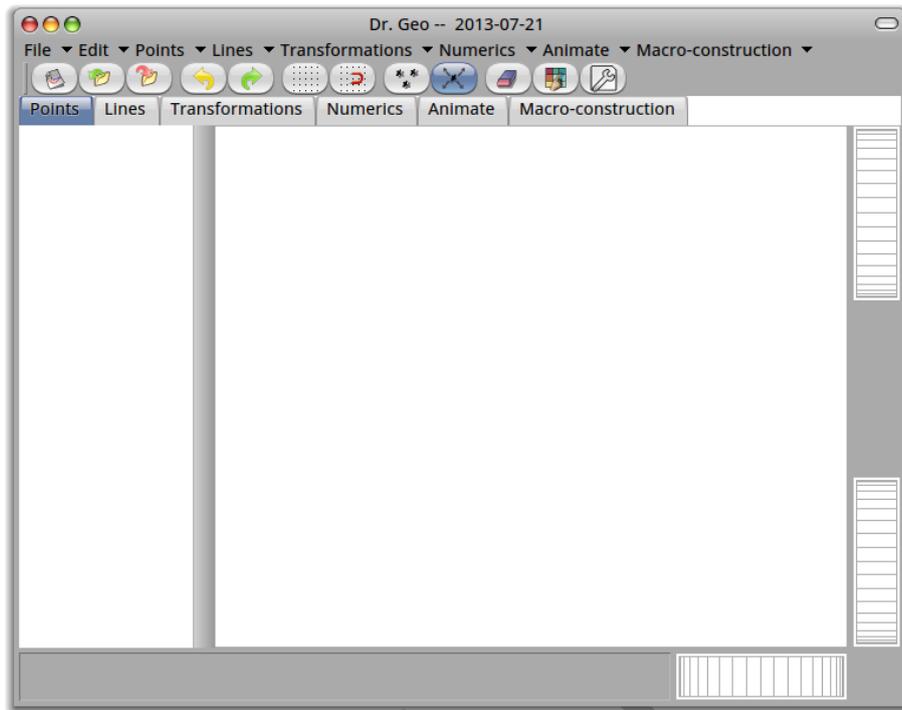
Figure 1.1: DR. GEO window with a blank sketch

Philosophy of the application

DR. GEO II is a multi-plate-forms interactive geometry free software[2]. It is a complete rewrite of DR. GEO 1.1 in Pharo Smalltalk – `http://pharo-project.org`.

DR. GEO 1.1 was written in C++ and integrated with a Scheme interpretor to write script and programmed sketch. DR. GEO II also proposes script integrated in geometric sketch and the design of programmed sketch with a programming language.

The rewrite in Smalltalk was motivated by its unique dynamic qualities; it gives us a lot of freedom when designing the interaction between the user and the application. So DR. GEO is not only a convivial interactive geometry application but it is also, as distributed, a complete programming environment to study, to modify and to improve it.

For a quick preview of these ability, the user is invited to click in the background of DR. GEO – outside any window – and to choose in the menu `Tools>System Browser`. A system browser lets the user modify DR. GEO source code while it is running.

This user access to the source is part of the DR. GEO DNA; it is part of the free software philosophy as well, for a complete open approach, unlocked, with great opportunity for learners.

With this same spirit of openness, programmed sketch and script – presented in the advanced tools section – relies on a great set of developer tools: browser, debugger, inspector, etc.

In the following we will name indifferently the application DR. GEO II or DR. GEO.

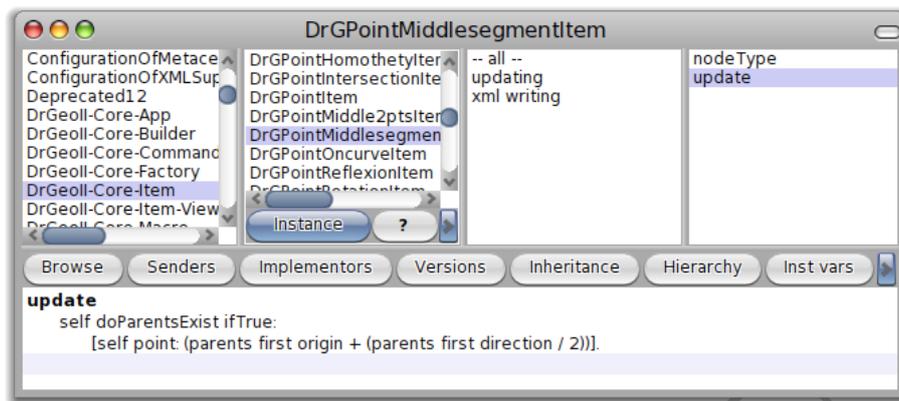[2]A free software is software whose source code can be studied, modified and redistributed.

Figure 1.2: System browser opened on the DR. GEO source code from DR. GEO itself

Dr. Geo on the web

DR. GEO has its own web place at `http://drgeo.eu`. Here you will find the following information:

- how to get DR. GEO,

- documentation,

- information about the DR. GEO project,

- reading about DR. GEO.