Informe: tutoriales de NetLogo

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***Abstract*— En este informe se presenta el desarrollo de una serie de tutoriales cuyo objetivo es ensear los fundamentos del lenguaje de programacin NetLogo.**

I. INTRODUCCIÓN

NetLogo es un entorno programable de modelado para simulacin. Es especialmente adecuado para modelar sistemas complejos que se desarrollan en el tiempo. Los modeladores pueden dar instrucciones a cientos o miles de ”agentes” independientes todos operando en paralelo. Esto hace que sea posible explorar la relacin entre el nivel micro del comportamiento de los individuos y los patrones a nivel macro que emergen de la interaccin de muchos individuos.

NetLogo permite abrir simulaciones y jugar con ellas explorando su comportamiento bajo diferentes condiciones. Tambin es una herramienta que permite crear modelos propios. NetLogo es suficientemente simple para permitir que estudiantes y maestros ejecuten fcilmente simulaciones o que incluso creen su propia simulacin. Y, es lo suficientemente avanzado como para servir como una poderosa herramienta para los investigadores en muchos campos.[1]

II. SIMULACIÓN BASADA EN AGENTES

A. Selecting a Template (Heading 2)

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B. Maintaining the Integrity of the Specifications

The template is used to format your paper and style the text. All margins, column widths, line spaces, and text fonts are prescribed; please do not alter them. You may note peculiarities. For example, the head margin in this template measures proportionately more than is customary. This measurement and others are deliberate, using specifications that anticipate your paper as one part of the entire proceedings, and not as an independent document. Please do not revise any of the current designations

III. EJECUCIÓN DE LOS TUTORIALES

A. Tutorial 1: Modelos

Este tutorial da una introducción a las funciones básicas de la interfaz del programa (botones, interruptores, deslizadores y monitores), usando los modelos de muestra que este trae consigo.

El tutorial comienza con la ejecución del modelo de depredacin lobo-oveja, un modelo poblacional predador-presa.

En Fig. 1 se ve la interfaz del programa justo antes de dar clic en el botón ’setup’. En Fig. 2, 3 podemos ver los

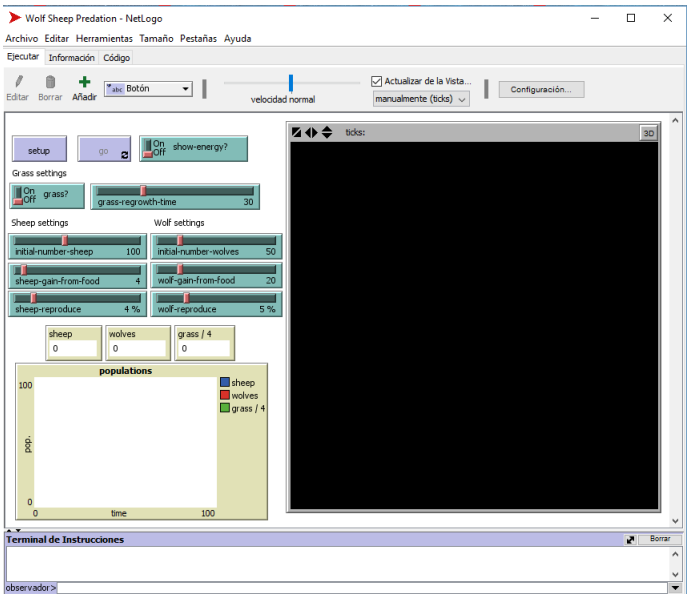

Fig. 1. Interfaz del programa antes del ’setup’.

resultados de variar los parámetros de la simulación en la interfaz del programa.

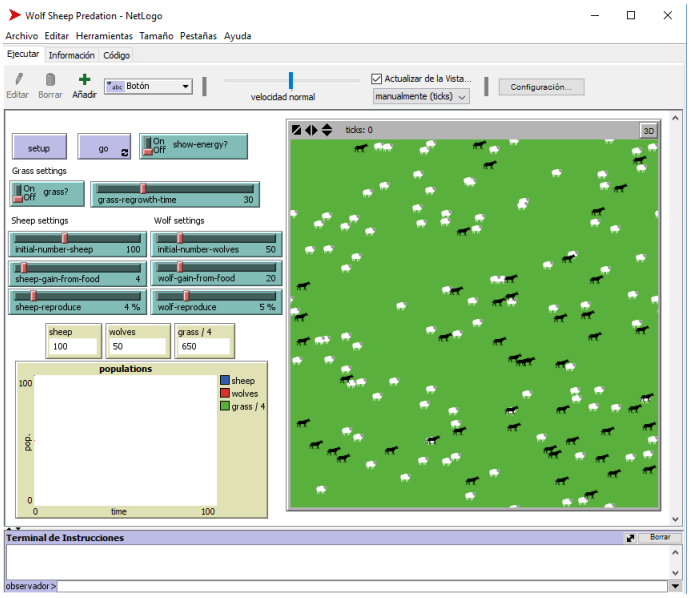

Fig. 2. Variación de parámetros en la interfaz de NetLogo.

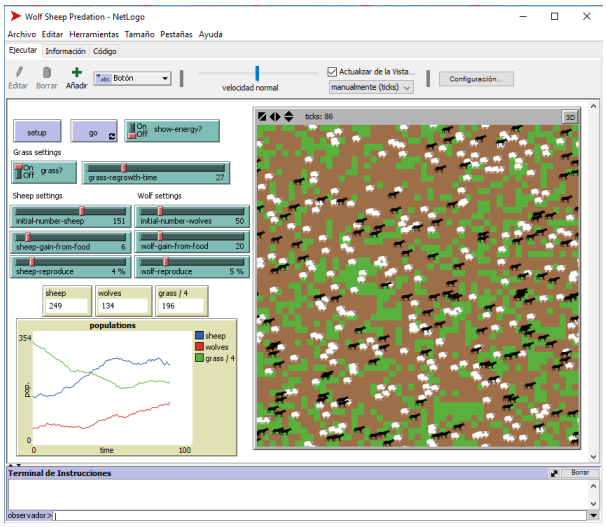

Fig. 3. Variación de parámetros en la interfaz de NetLogo.

La interfaz de NetLogo puede ser configurada en cuanto a sus dimensiones, esto se muestra en la Fig 4. En la interfaz de

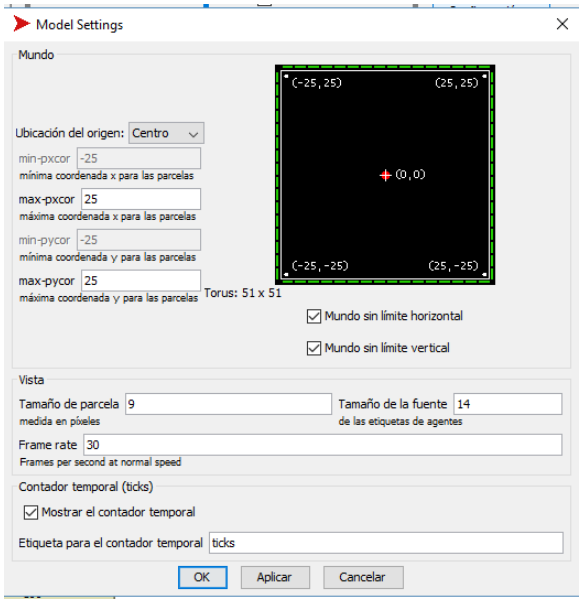

Fig. 4. Configuración de la interfaz

NetLogo, hay dos maneras de ver cuantitativa y gráficamente la evolución de las variables del modelo. Estas dos maneras son las gráficas y los monitores, estos son mostrados en la figura 5.

B. Tutorial 2: Comandos

El segundo tutorial explica la manera en que se pueden personalizar los modelos formulados usando el software. La mayor parte del tutorial se centra en los efectos cosméticos que se pueden conseguir.

El modelo utilizado es un modelo básico de tráfico vehicular, en el que se mide la velocidad de un vehículo que está en interacción con otros, en un ambiente en el que se producen trancones.

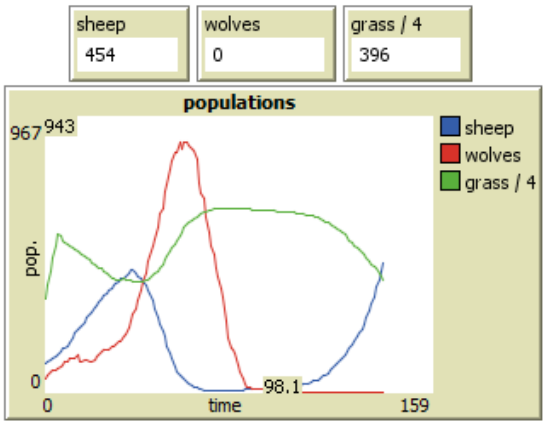

Fig. 5. Recolección de información en NetLogo

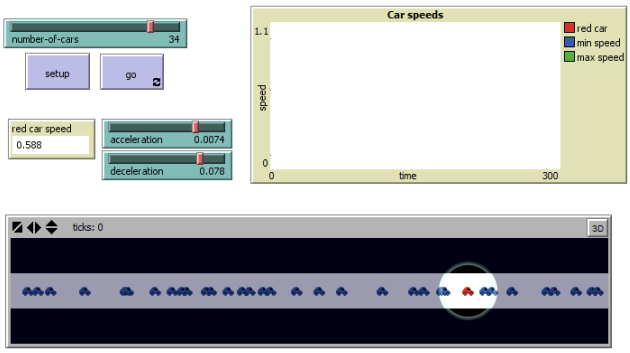

Fig. 6. Modelo de tráfico

Para la realización de estos cambios se utiliza el Centro de Comando de NetLogo, el cual permite introducir comandos e instrucciones al modelo. Los comandos son las instrucciones que pueden darse a los agentes de NetLogo: las tortugas, los parches, los enlaces y el observador.

En las figuras 7 y 8, se pueden ver algunos cambios de color aplicados a las tortugas y los parches.

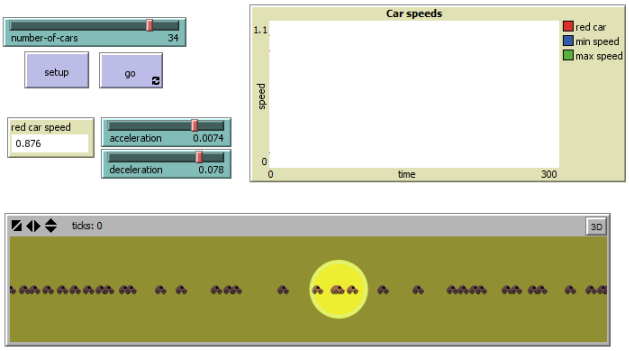

Fig. 7. Cambios de color aplicados al Modelo de tráfico

La mayor parte de los cambios realizdos en el Centro de Comando no son permanentes, y el modelo vuelve a la configuración descrita en la ficha de procedimientos cada vez que se haga clic en 'setup'.

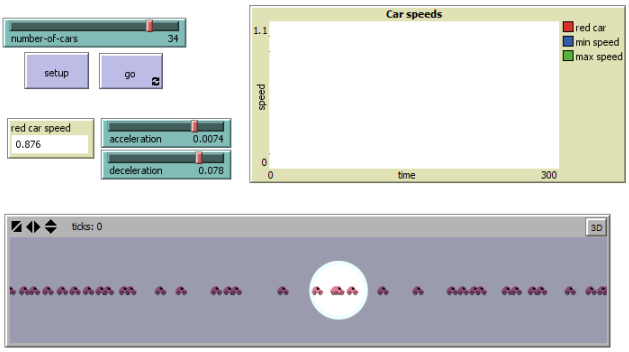

Fig. 8. Cambios de color aplicados al Modelo de tráfico

NetLogo permite aplicar cambios directamente a las tortugas y a los parches mediante los monitores de tortugas y de parches, respectivamente.

C. Tutorial 3: Procedimientos

El tercer tutorial se centra en la ficha de Procedimientos de NetLogo. Todos los agentes de NetLogo pueden ejecutar comandos, como se ha visto ya en los dos tutoriales anteriores. Un procedimiento es un conjunto de comandos que se ejecutan como si fueran uno solo.

En este tutorial crearemos un modelo, y aprenderemos como configurar cada una de sus características en la interfaz de NetLogo.

IV. USING THE TEMPLATE

Use this sample document as your LaTeX source file to create your document. Save this file as **root.tex**. You have to make sure to use the cls file that came with this distribution. If you use a different style file, you cannot expect to get required margins. Note also that when you are creating your out PDF file, the source file is only part of the equation. *Your TEX → PDF filter determines the output file size. Even if you make all the specifications to output a letter file in the source - if you filter is set to produce A4, you will only get A4 output.*

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A. Headings, etc

Text heads organize the topics on a relational, hierarchical basis. For example, the paper title is the primary text head because all subsequent material relates and elaborates on this one topic. If there are two or more sub-topics, the next level head (uppercase Roman numerals) should be used and, conversely, if there are not at least two sub-topics, then no subheads should be introduced. Styles named Heading 1, Heading 2, Heading 3, and Heading 4 are prescribed.

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Positioning Figures and Tables: Place figures and tables at the top and bottom of columns. Avoid placing them in the middle of columns. Large figures and tables may span across both columns. Figure captions should be below the figures; table heads should appear above the tables. Insert figures and tables after they are cited in the text. Use the abbreviation Fig. 1, even at the beginning of a sentence.

TABLE I
AN EXAMPLE OF A TABLE

One	Two
Three	Four

We suggest that you use a text box to insert a graphic (which is ideally a 300 dpi TIFF or EPS file, with all fonts embedded) because, in an document, this method is somewhat more stable than directly inserting a picture.

Fig. 9. Inductance of oscillation winding on amorphous magnetic core versus DC bias magnetic field

Figure Labels: Use 8 point Times New Roman for Figure labels. Use words rather than symbols or abbreviations when writing Figure axis labels to avoid confusing the reader. As an example, write the quantity Magnetization, or Magnetization, M, not just M. If including units in the label, present them within parentheses. Do not label axes only with units. In the example, write Magnetization (A/m) or Magnetization A[m(1)], not just A/m. Do not label axes with a ratio of quantities and units. For example, write Temperature (K), not Temperature/K.

V. CONCLUSIONS

A conclusion section is not required. Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions.

APPENDIX

Appendixes should appear before the acknowledgment.

ACKNOWLEDGMENT

The preferred spelling of the word acknowledgment in America is without an e after the g. Avoid the stilted expression, One of us (R. B. G.) thanks . . . Instead, try R. B. G. thanks. Put sponsor acknowledgments in the unnumbered footnote on the first page.

References are important to the reader; therefore, each citation must be complete and correct. If at all possible, references should be commonly available publications.

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