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LINCE PLUS: a new computer video-graphic record program

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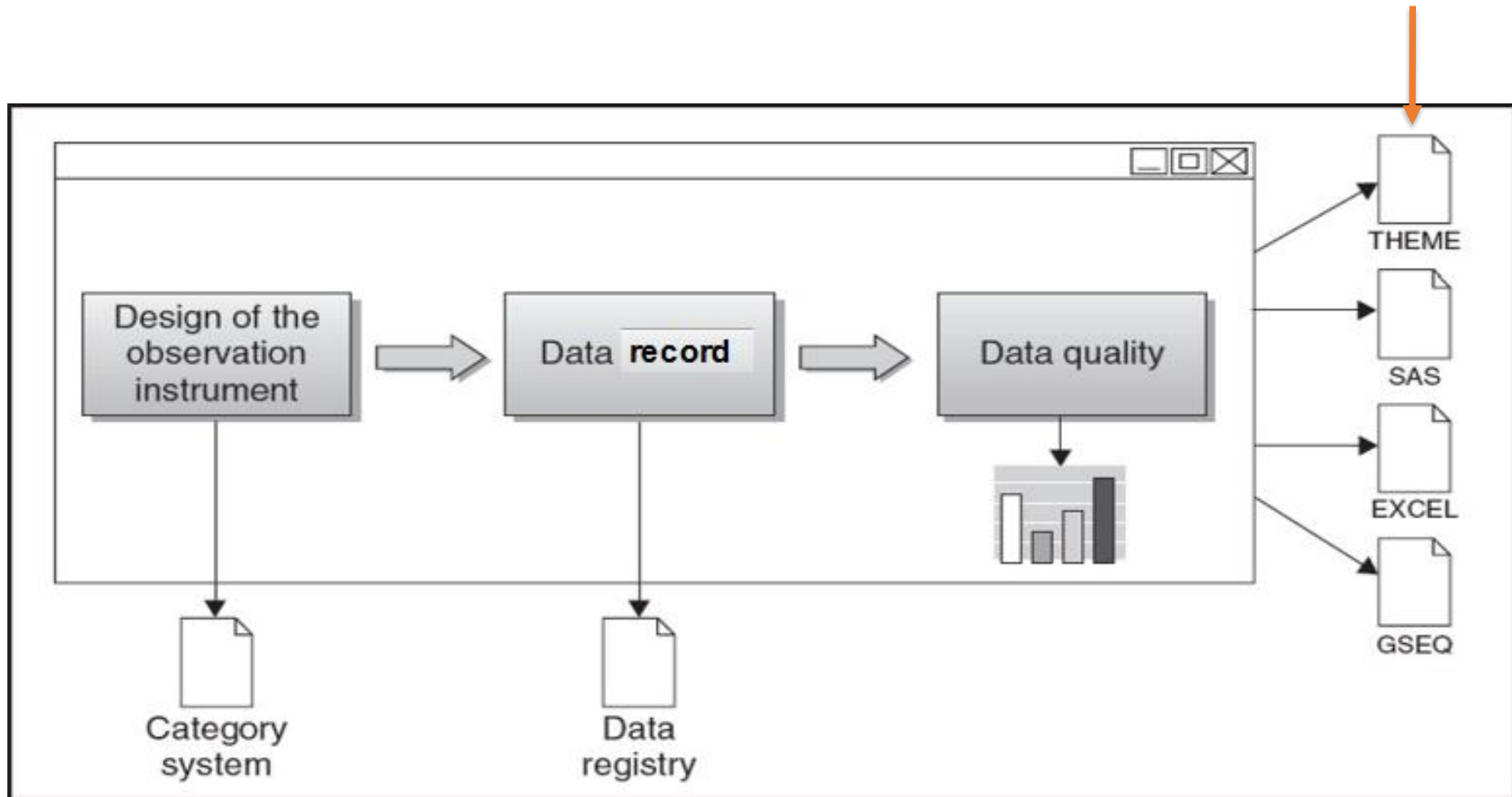
LINCE (Gabin, et al. 2012) is a computer video graphic record program that has been consolidated from 2012, and its use has increased in multitude of research in the sport and the psychology.



The screenshot shows the LINCE software interface. The main window is titled 'Lince' and has a menu bar with 'Archivo', 'Reproductor', 'Calidad del dato', 'Idioma', and 'Ayuda'. Below the menu bar is a tabbed interface with 'Instrumento observacional' and 'Registro'. The 'Registro' tab is active, showing a 'Visualización selectiva' section with various criteria and categories. The main video area displays a basketball game. The interface includes a video player with standard controls (play, pause, stop, skip back, skip forward, volume, and a progress bar). The right side of the interface contains a 'Registro' section with a grid of buttons for 'Lateralidad', 'Zona', 'Posesión', and 'Interacción contextos'. At the bottom, there are buttons for 'Editar datos fijos', 'Eliminar registro', 'Limpiar selección', and 'Añadir registro'.

1. Video replay area
2. Position slider
3. Play and pause
4. Stop video and return to start
5. Change replay speed
- 6 and 7. Video sound and volume
8. Replay speed
9. Skip back
10. Skip forward
11. Time indicated
12. Current time of video
13. Criteria and categories

Introduction



Introduction

In the next months, there will be available a new version (LINCE PLUS), which increases the possibilities of the current one.



LINCE PLUS: Research Software for Behavior Video Analysis

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Abstract

For many years the free LINCE software has been used by many researchers needing a tool to tag behaviors using video recordings, coding behaviors and data register. However, as a research group we envisage new challenges with regards to technology novelties, designing a new tool for the future that can be used in any type of device and closely working on line. LINCE PLUS is a free systematic observational research software that will enable including new trends such as artificial intelligence, web management, collaborative work as well as complex statistical packages, such as integrating the same R language compiler inside the application. It's time for LINCE PLUS.

Keywords: computerized observation, observable behaviors, multifunctional software, statistics, open source, R language

Background

LINCE platform (Gabin et al., 2012) has been successfully used in many investigations (i.e., Castañer et al., 2016; Lapresa et al., 2017; Lozano & Camerino, 2012; Taragó et al., 2016) with big support from the community (Hernández-Mendo et al., 2014). "It is easy to use and integrates a wide range of necessary functions: coding, recording, data quality calculation and information analysis in specific formats, thereby enabling it to be directly exported to several applications." (Gabin et al., 2012, p. 4692). Considering that nowadays technology evolves continuously, the platform focuses on the possibility of being used in any operating system or platform, including tablets or smartphones. At a general level, the evolution of the LINCE software towards the new application must be able to analyze the data in a systematic way and, if possible, following the mandatory phases that are recommended for observation (Anguera et al., 2018; Portell et al., 2015). This starts with generating specific observational tools, coding, collecting observed data as well as enabling their analysis and easing their interpretation.

Features and aim of LINCE PLUS

Taking into account all the necessary aspects on portability and more practical software, we were forced to

find which tools could simplify the most complex tasks about the observation process such as analysis and interpretation. Thus, the new application reuses part of the old version and delegates complexity on other tools in the market that were a standard as well as reliable.

A factor of great complexity is portability to any device, since many of them did not allow complex calculations and, on the other hand, each one needs a specific implementation of the application, creating Android and iOS apps or Mac Os and Windows installers. The only language that allows maximum portability and faster execution speed continues to be Java, but it can complicate portability in certain types of portable devices. However, there is a universal language to each application throughout the Internet: Html. Migrating all the code to a web behavior would encompass many additional problems at both statistical and video levels, but, nevertheless, it would facilitate the communication task between different devices. LINCE PLUS includes the simultaneity and synchronization of several videos at the same time. Web behavior enables several observers to simultaneously connect and perform independent analyses while working collaboratively. As LINCE PLUS also includes R language, in the future, we will be able to merge it with artificial intelligence.

Scientific Notes

NEW JOURNAL SECTION

Apunts. Educación Física y Deportes is pleased to announce the introduction of a new journal section – Scientific Notes – that will contain short articles dealing with novel approaches and scientific advances in the field of Physical Education and Sport. Articles should be submitted in English.

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Introduction

It will be characterized by:

Working in group (team) of researchers from any device with Internet connection.

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Support to **tactile devices**.

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To include the **statistical engine of the software R**

APPLICATION LINC PLUS

Lince
Observation Tool

PERFIL + CATEGORÍAS + DATOS

Inicio > Principal

Lince Multi-platform sport analysis software

Inicio

Configurar

Escenas

Analizar

Resultados

Consola R



CONSEJOS DE LINC

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Sobre el funcionamiento

Lince genera un servidor web cada vez que arranca. Ésto te permite poder trabajar en equipo y cada ordenador, tablet o teléfono de tu conexión local pueden acceder a él utilizando la IP de tu máquina, que la puedes ver en la dirección de internet arriba del todo. Recuerda que se debe añadir el puerto y que éste cambia cada vez.

INFORMACIÓN LEGAL

Nota legal sobre ficheros multimedia

Lince software utiliza herramientas con la última tecnología opensource y de código abierto para permitir realizar las observaciones personalizadas que necesitas. Puedes ver toda la información de compatibilidad de navegadores aquí

La compatibilidad con los diversos formatos de vídeo es de carácter legal entre otros, así que no podemos dar soporte a otros formatos no contemplados o obsoletos.

Si no pudieras trabajar con esos formatos puedes transformar tu mismo el formato que quieras y reproducirlo en el escritorio. Existen varios programas para ello. Si no conoces ninguno, puedes utilizar [EasyHtml5video](#)

Declinación de responsabilidad

Generates a friendly atmosphere

APPLICATION LINC PLUS

Lince
Observation Tool



Inicio

Configurar

Escenas

Analizar

Resultados

Consola R

PERFIL

+ CATEGORÍAS

+ DATOS

Inicio > Categorías

Lince Multi-platform sport analysis software

CONFIGURACIÓN DE CATEGORÍAS OBSERVACIONALES

Criterios y categorías de observación

Código	Nombre	Descripción	Valor de reducción	Persist.	Categorías												
cod-1	C1			☐	<table><thead><tr><th>Código</th><th>Nombre</th><th>Valor de reducción</th><th></th></tr></thead><tbody><tr><td> cod-2 </td><td> C1-1 </td><td> </td><td> × ↓ </td></tr><tr><td> cod-3 </td><td> C1-2 </td><td> </td><td> × ↑ </td></tr></tbody></table> + CATEGORÍA × LAST CATEGORÍA × ALL	Código	Nombre	Valor de reducción		cod-2	C1-1		× ↓	cod-3	C1-2		× ↑
Código	Nombre	Valor de reducción															
cod-2	C1-1		× ↓														
cod-3	C1-2		× ↑														
cod-4	C2			☐	<table><thead><tr><th>Código</th><th>Nombre</th><th>Valor de reducción</th><th></th></tr></thead><tbody><tr><td> cod-5 </td><td> C2-1 </td><td> </td><td> × ↓ </td></tr><tr><td> cod-6 </td><td> C2-2 </td><td> </td><td> × ↑ </td></tr></tbody></table> + CATEGORÍA × LAST CATEGORÍA × ALL	Código	Nombre	Valor de reducción		cod-5	C2-1		× ↓	cod-6	C2-2		× ↑
Código	Nombre	Valor de reducción															
cod-5	C2-1		× ↓														
cod-6	C2-2		× ↑														

Dynamic observation tool: All data can be easily created,
without limits on quantity.

APPLICATION LINC PLUS

▶ VIDEO

SCENE CREATION

MULTIPLE VIDEO PLAYING

GUARDAR POSICION ACTUAL

ACCIONES SIMULTANEAS



MUTE

SINC

Escena Paleo identico

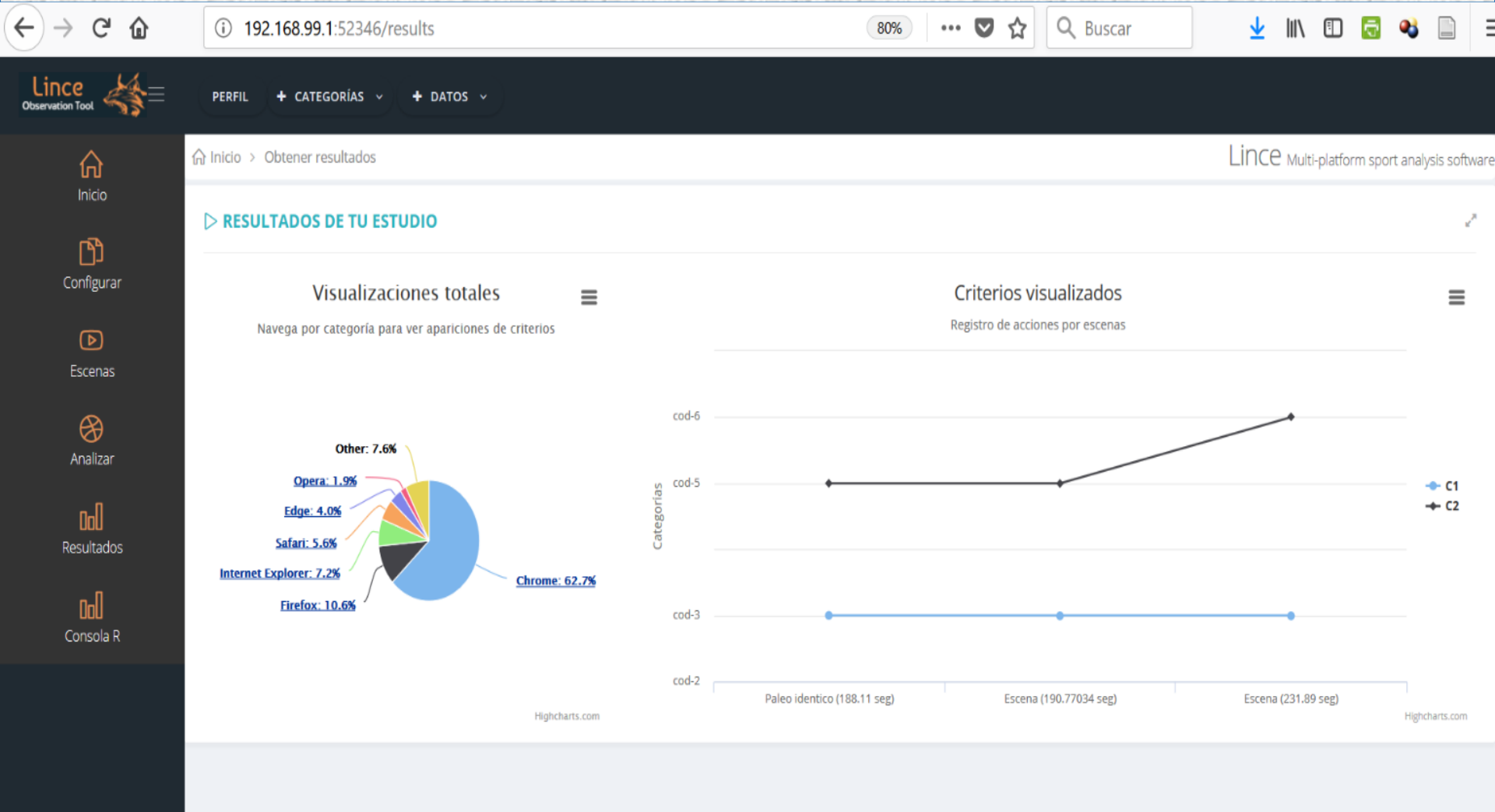


Escena Paleo identico



Scene detection and **multi video player**:
Detect which parts you want to analyze before starting!

APPLICATION LINC PLUS



Includes a graphical engine to show basic stats for your study

APPLICATION LINC PLUS

R CONSOLE

Variables R ctx linceData linceDataByCategory

EJECUTAR

```
1 print('Lince ejecuta codigo R!');
2 print(linceData);
3 print(linceDataByCategory);
4 #otro codigo de ejemplo!
5 df <- data.frame(x = seq(5), y = runif(5));
6 print(df);
7 print(attributes(df));
8 print(is.list(df));
9
```

MAKE YOUR R CODE

R RESULT

Ejecución finalizada

R EXECUTION

```
1 Loading required package: shiny
2 Loading required package: methods
3 Loading required package: irr
4 Loading required package: lpSolve
5 [1] "Lince ejecuta codigo R!"
6      VideoTime      SceneName      StartFrame      Categories
7 [1,] "188000"      "Paleo identico" "3950"      "cod-3, cod-5"
8 [2,] "190000"      NA              "4006"      "cod-3, cod-5"
9 [3,] "231000"      NA              "4869"      "cod-3, cod-6"
10      VideoTime      SceneName      StartFrame      cod-1
11 [1,] "188000"      "Paleo identico" "3950"      "cod-3"
12 [2,] "190000"      NA              "4006"      "cod-3"
13 [3,] "231000"      NA              "4869"      "cod-3"
14 x      v
15 <----->
```

¿SABÍAS QUÉ...?

SOME PIECE OF ADVICES FOR STARTING

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La primera vez que ejecutes R tardará un poco más, ten paciencia.

Aunque R te permite ejecutar sin ";" al final de cada instrucción, a través de esta consola debes introducir siempre ";". ¡Pero eso no te limita para crear tus propias funciones! Por ejemplo:

```
Square <- function(x) {
  return(x^2);
}
print(Square(16));
print(match(5, c(2,7,5,3))); # 5 is in 3rd place
print(seq(from=1,to=3,by=.5) %in% 1:3);
```

LINCE PLUS includes
R engine to create your own statist reports.

IN SUMMARY

▶ VIDEO

GUARDAR POSICION ACTUAL

ACCIONES SIMULTANEAS



1 2 3



✓ Datos guardados
Escena guardada

ESCENAS DETECTADAS EN EL VÍDEO

Acción	Id	Tiempo	Frame
  	1	00:03:08 s	3.950 fr.
  	2	00:03:10 s	4.006 fr.
  	3	00:03:51 s	4.869 fr.

LINCE PLUS is created to work in scientific teams to achieve your goals.

It's made for you and for analyse of all sort of behaviors.

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