Previsim

A transportable driving simulator with multiple posts for the training of professional drivers in road safety

Pedro M. Valero-Mora (valerop@uv.es)

Mar Sanchez-García
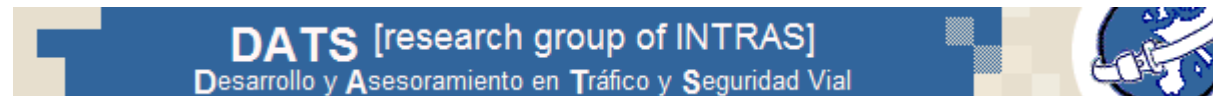
Ignacio Pareja-Montoro

Dresden, 21 January 2009

Grupo SINTEC
Instituto de Investigación en
Tráfico y Seguridad Vial
VNIVERSITAT DE VALÈNCIA

DATS [research group of INTRAS]
Desarrollo y Asesoramiento en Tráfico y Seguridad Vial

VNIVERSITAT DE VALÈNCIA

Institut de Robòtica

Team members (in alphabetical order)

Francisco Alonso

Associate Professor. Universitat de València

Inmaculada Coma

Associate Professor. Universitat de València

Marcos Fernández

Associate Professor. Universitat de València

Jesús Gimeno

Research fellow. Universitat de València

Miguel Martínez

Research fellow. Universitat de València

Ignacio Pareja

Senior Technical Expert of Research. Universitat de València

Mar Sánchez

Graduate. Senior Technical Expert of Research. Universitat de València

Pedro Valero

Associate Professor. Universitat de València

Iñaki Aliaga

Technical Director. Lander Simulation & Training Solutions

Miguel Iranzo

Director. Iniciativas de Educación y Seguridad Vial S.L.

La motivación para hacer frente a este proyecto por parte de INICIATIVAS DE EDUCACION Y SEGURIDAD VIAL S.L. nace en la propia actividad desarrollada por ésta como formadora e instructora en educación y seguridad vial y en el grave problema social que generan los accidentes de tráfico vinculados a la actividad laboral en España.

Los accidentes de tráfico son un problema social de especial importancia y repercusión, si tenemos en cuenta el gran número de muertos y lesionados que producen en nuestro país. Este problema objetivo, es también percibido de la misma forma por parte de la población española.

En concreto, los accidentes de tráfico en el entorno laboral son un destacado problema que, a diferencia del resto de accidentes laborales, sigue creciendo día a día. Los accidentes de tráfico en el entorno laboral se clasifican en:

- Accidentes "in-itinere", que se producen en los desplazamientos del lugar de residencia al lugar de trabajo y viceversa.

- Accidentes en misión, que se producen en el desempeño de las funciones del puesto de trabajo.

Una idea de la importancia y características de este problema la proporciona la siguiente información:

- Los accidentes "in-itinere" y en misión suponen cada año alrededor de la mitad de todos los accidentes de trabajo mortales.

- En determinadas empresas los accidentes "in-itinere" vienen a representar la cuarta parte de todos los accidentes de trabajo.

- Las condiciones en el trabajo han hecho disminuir los riesgos de sufrir un accidente laboral, así como la gravedad de su consecuencia; sin embargo, no ha ocurrido lo mismo con estos accidentes y sus consecuencias, que están siguiendo una notable progresión ascendente en el total de accidentes.

- En los últimos 10 años, el número de conductores víctimas de accidentes laborales se ha incrementado en un 45% (un 32% en misión y un 74% los "in-itinere").

VNIVERSITAT IDƓ VALÈNCIA

INTRAS
INstituto de TRAfico y Seguridad Vial

Institut de Robòtica

SINTEC
Grupo de Investigación

dats

RTEC

LANDER
SIMULATION & TRAINING SOLUTIONS

CDTI — Centro para el Desarrollo Tecnológico Industrial

GENERALITAT VALENCIANA

IMPIVA

Iniciativas
de Educación
y Seguridad Vial

PREVISIM
sicam

SIMULADOR DE PREVENCIÓN DE
RIESGOS LABORALES
DE TRÁFICO

Iniciativas
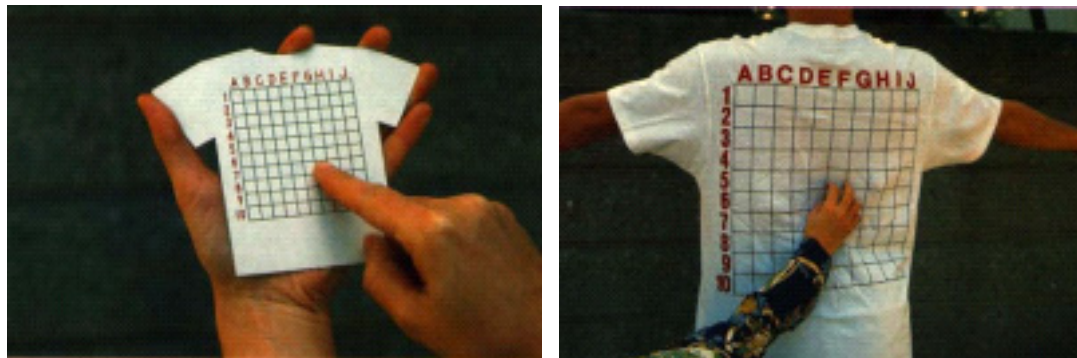de Educación
y Seguridad Vial

www.iesv.es

Introduction

Introduction: Chindogus

- A chindogu is something that apparently has an use, but in practice is useless

- The international socitety for chindogus keep record of a number of them. Here is an example

- Chindogus are not easy to make.

  - Good chindogus are able to deceive you for a second (or longer)
  - The best ones, you have to try them in practice

- Are driving simulators chindogus?

  - I hope not, I have put a lot of time and energy on them
  - However, like chindogus, we need to try them in practice

Are driving simulators a good idea?

Are driving simulators a good idea?

- A solution looking for a problem

    - Many agree there is an opportunity for using simulators for training but they are not a panacea

- They are not a solution by themselves

    - They have to be used in connection with theory, sound teaching methods, etc.

- We need to explore diferent scenarios of of training to find the proper use of simulators

Our approach

Our approach

- We focus on changing attitudes

  - Indeed, we prefer the word education to the word training

- One by one is not enough, we adress groups of people at the same

- Driving simulation is not enough to change attitudes, we need more:

  - Discussions

  - Group debriefings

  - Data

A typical seminar

A typical seminar

- Goals

  - Changing negative attitudes, behaviours, etc. with respect to driving
  - Specific topics could be risk acceptance, effects of alcohol, excess of speed, weather conditions, etc.

- Participants

  - About ten

- Dynamics

  - The participantes drive the circuit that has been selected according to the characteristics of the specific topic

    Performance of each driver is analyzed semi automatically. Individual recordings of each participant are produced

- Break.

  The conductor of the seminar uses this time to evaluate the performance of the individuals

  Specific examples taken from the own participants of bad driving are drawn

- Discussion starts

  The conductor of the seminar makes a short introduction about the consequences on driving of the specific topic under consideration

- Debriefing of the performance of the drivers.

  Recordings and performance data are examined in group

  The conductor of the seminar explains why these behaviours are uncorrect.

  All the subjects can ask questions, raise issues, etc.

- Time duration

  - Half day/full day

- Where?

  Our driving simulator is on a truck, so we can take it where it is required

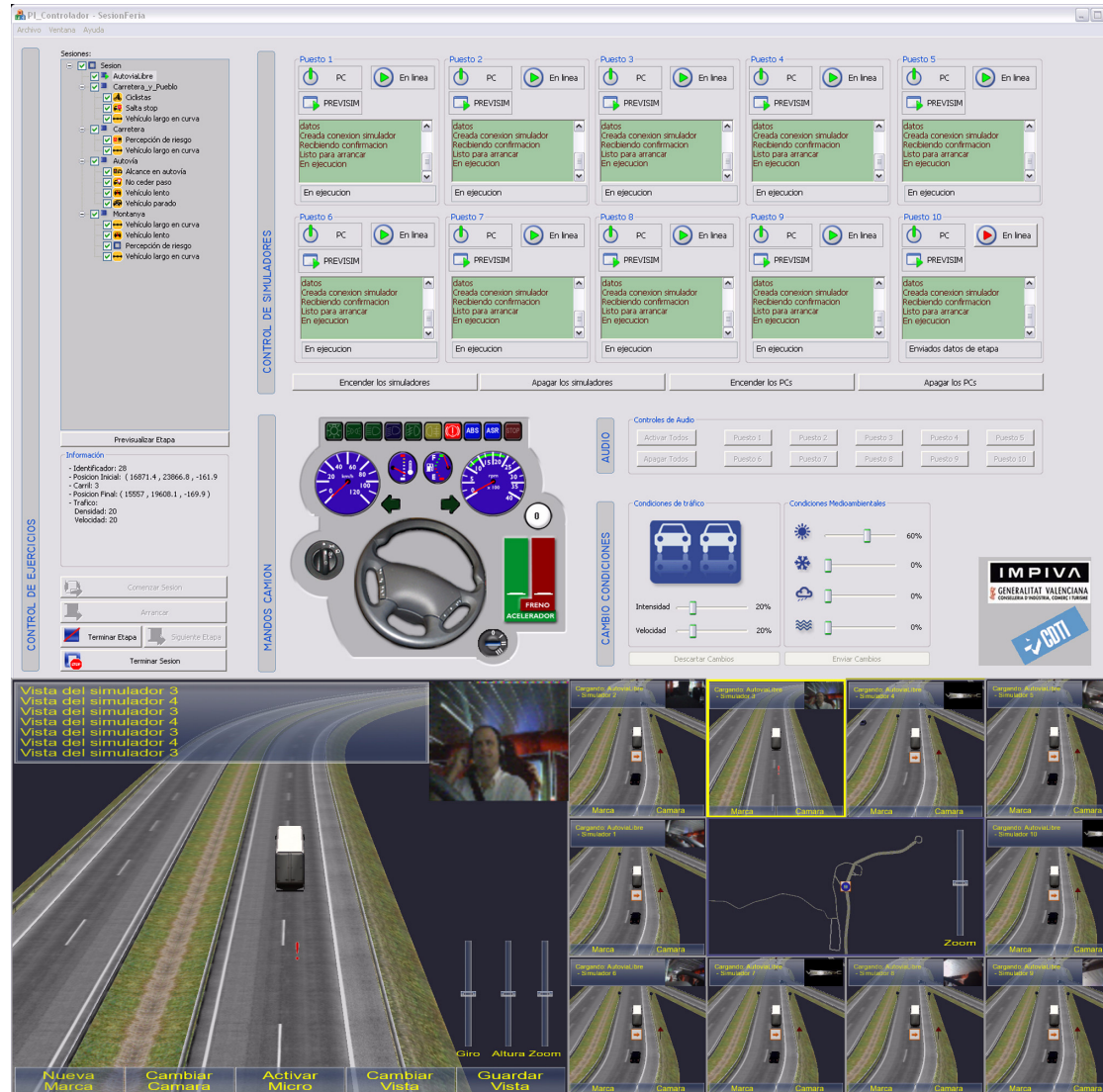# Previsim description

Previsim description

- It is a Simulator oriented to groups

    - Multiple posts: it allows up to 10 drivers simultaneously

    - Monitorables from a central post

    - Transportable (it is installed in a lorry)

    - Flexibility in the lessons which allows it to be adapted to different objectives

Multiple posts

- Ten seats simultaneously

- The driving seat is the one of a real lorry

- There is no moving platform

- Three small screens allow a reduced but sufficient visibility

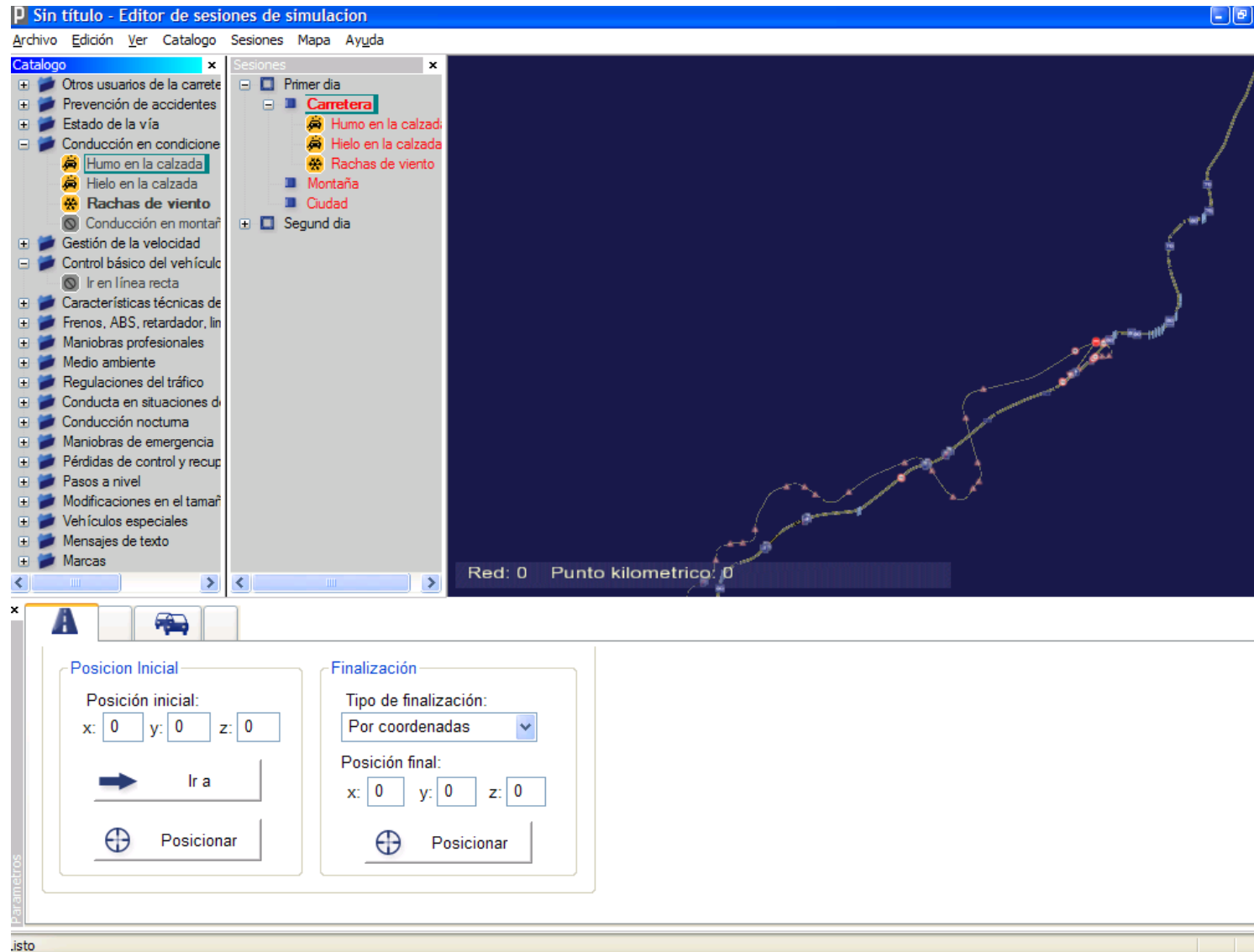# Monitored from a central post

- Quite challenging situation: the teacher has to observe up to ten drivers at the same time

- It automatically collects the execution information of each driver and points out (automatically as well) when there are deviations or driving errors

- It is possible to manually enter inappropriate behaviour marks

- The person in charge of monitoring can talk to the subjects individually if necessary

Transportable

- It has been installed in a lorry

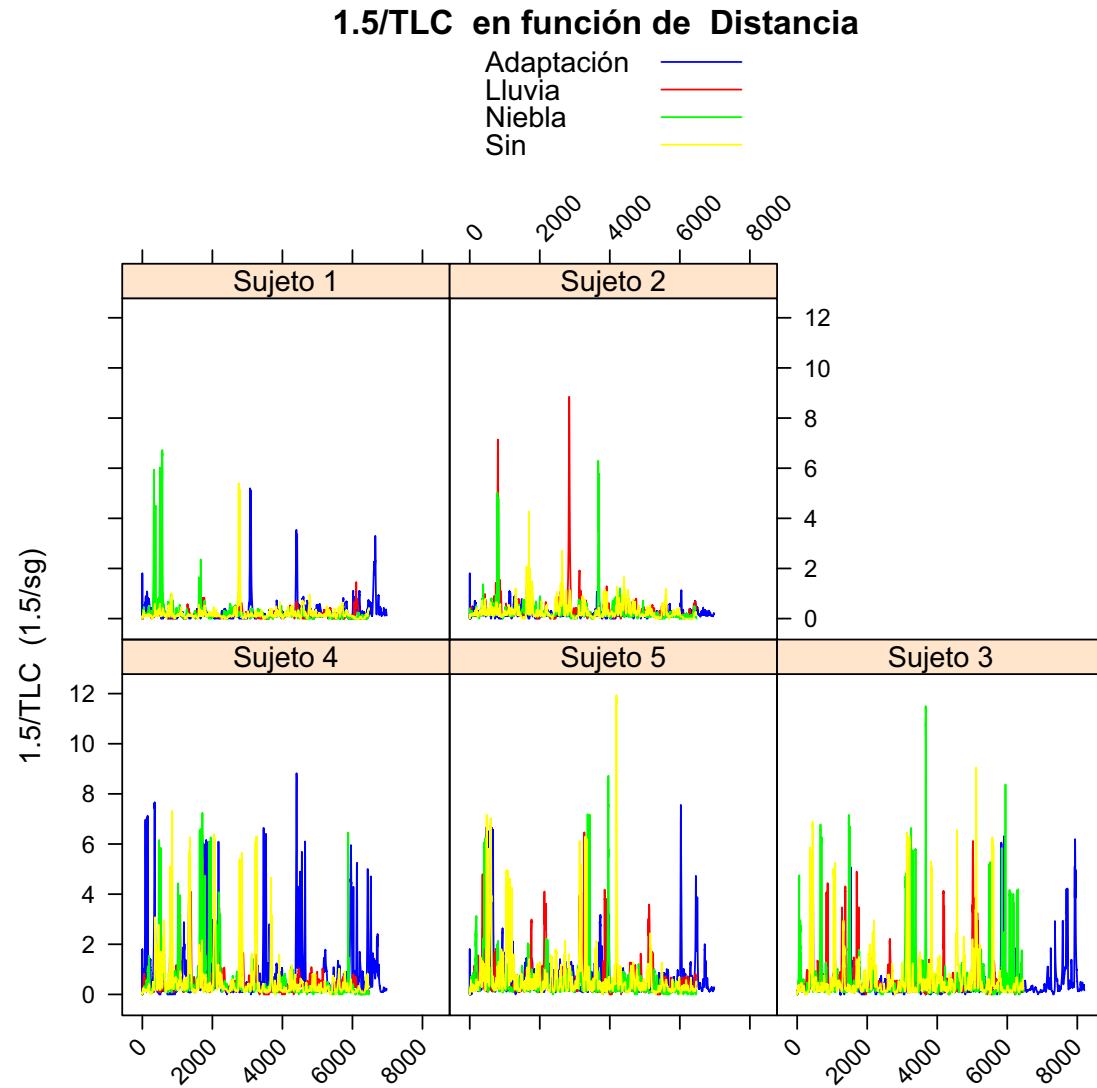- It can be brought where it is needed

Can be configured for different purposes

- Teaching through a simulator is based in scenarios or situations that the subjects may experience in a practical way

  - We provide a list of ready-made scenarios so the teacher can select those most appropriate for the specific goals to be worked in the session

  - This is done via a graphical application

- According to the objective and the features of teaching, several things could be needed:

  - Different types of scenarios

  - Different numbers of scenarios

  - Different orders of the scenarios

  - Different degree of difficulty

  - Etc.

- With Previsim, it is possible to:

  - Place scenarios in the route

  - Decide when they start and finish

  - Configure the parameters of the scenarios

  - Save the scenario configurations (like lessons or classes)

  - Select the data measured in each scenario

- This way, it is possible to configure different routes adapted to different educational objectives. For example:

  - Eco-driving courses

  - Courses on manoeuvres in emergency situations

  - Courses on risk perception

Quick evaluations

1.5/TLC en función de Distancia

- Previsim has been thought to offer information/a summary of the behaviour of several subjects quickly:

  - By comparing the subjects in each scenario
  - By comparing the subjects through all the scenarios
    This information allows classifying the subjects according to their behaviour

- Data are analysed using the free R language for statistical analysis

  - Data are saved, and a script is run that displays the graphics (trellis plots)
  - We are still playing with the data trying to find the best representation/analysis for the situation

- Moreover, it is possible to look up the information on specific moments of the inappropriate driving

  Performance of the students is recorded as reproducible (3D) movies

- With all that, it is possible to organize:

  - Debriefing sessions quickly
  - Group dynamics about the topic of the seminar

Final Remarks

Final Remarks

- Previsim is a driving simulator oriented to professional drivers that is focused on teaching to groups of subjects

- The Previsim approach is to allow organizing a course in which

  - Theoretical sessions are given

  - Practices are carried out and

  - A group dynamic is done on the individual performances

- Previsim is good to complement road safety theoretical training in topics such as:

  - Defensive driving and driving in special situations

  - Risk perception

  - Being aware of the other road users

  - Eco-driving

Thanks for your attention