ISAT Quick Start

Interactive Scenario Authoring Tool

miniSim™

ISAT Purpose:

Design, rehearse scenarios for simulation and review drive data contained in the DAQ

How:

Assemble scenario elements to create an experience for the simulator driver, aka External Driver (XD)

- Triggers
- Dynamic elements, i.e. traffic,
- Static elements, i.e. signs, ob

NOTE: ISAT is not a 3D modelling tool

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Interactive Scenario Authoring Tool
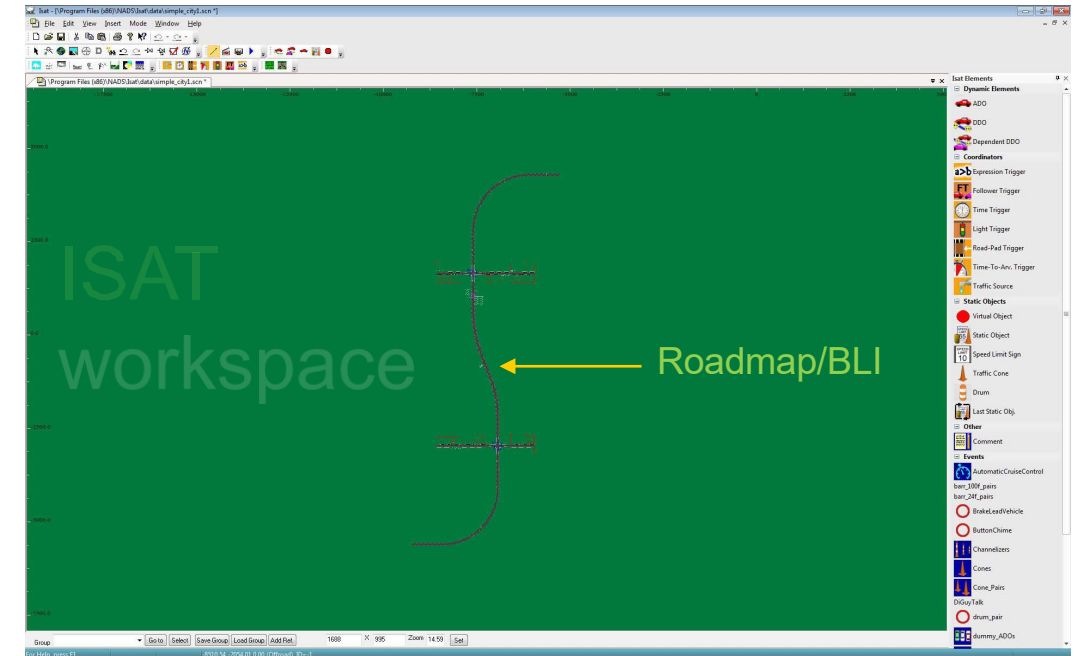

Requirement:
ISAT requires a roadmap (BLI) to use for every scenario.

Requires a start location
Insert > External Driver > LMB on roadmap, aka XD

Can I re-use a scenario from one BLI on a different BLI?
Not entirely. Many scenario elements contain data specific to the BLI, so it is not possible to just use the scenario on another BLI.

However, you can copy most scenario elements from one BLI to another.
*not the XD; not elements created using a create action

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Everything in a simulation happens as a result of the scenario.

How do things happen in a simulation?
Triggers/coordinators issue commands to the simulator via ACTIONS to operate on other scenario elements (traffic, triggers, static objects), the environment or to perform calculations.

Dynamic elements in a scenario can activate triggers as well as the XD.

Triggers:
1. Roadpad
2. Time
3. Expression
4. Time to arrival
5. Follow
6. Traffic Signal
7. Geometric Position

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Triggers & Predicates (activators)

Each trigger has a unique activation but they **all share the same actions**:

Roadpad – something 'steps on' the trigger road pad **Time** – elapsed or delay time threshold reached **Expression** – when the expression evaluates to True, the actions are executed

Time to Arrival – adds a time element to a roadpad trigger; when the time is reached relative to the target location, the actions execute

Follow – any two dynamic elements occupying the follow trigger roadpad; when conditions are satisfied the actions execute

Traffic Signal – when the specified signal state is achieved the actions execute

Geometric Position – *not currently working; can emulate with a time trigger that has a creation radius (area where the trigger is alive) only for the External Driver (XD)*

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Which Trigger is Right?

Because triggers share the same actions, there is not any one "right" trigger, but some triggers are **most appropriate** for specific situations:

Roadpad – use to define a particular location on the roadmap. Can also be filtered to a specific lane at that location.

Time – operates independent of location unless a creation radius is defined – then it works like a Geometric Position trigger.

Expression – when the actions should execute *depending on some other thing or things.*

Time to Arrival – when a time element is desired at a specific location on the roadmap; often used to accommodate different driver performance styles (aggressive vs. conservative).

Follow – when a spatial relationship between 2 elements is needed (i.e. for completing a passing maneuver).
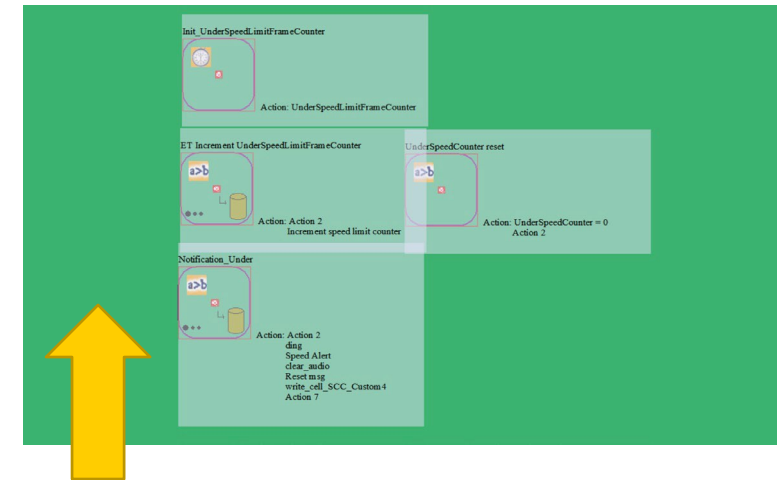
Note:
Sometimes multiple triggers are needed to work together to accomplish a task, such as a driver performance monitoring and alert system

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Actions are the commands executed during a simulation:

- Create or remove scenario elements
- Control elements (speed up, slow down, adjust lane position) or environmental conditions
- Change traffic signal states (i.e. change red light to green)
- Play an audio message (sound)
- Show information on-screen for the XD as text
- Retrieve information about a scenario element and use it or save it into a variable
- Perform some calculation on the retrieved information

Actions are typically organized around Events (something of interest or significance during a simulation).

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Library of Object Models

ISAT and miniSim use a shared library of object models to populate the simulation called the Scenario Object Library. The library is defined within one sol2.txt and additional resource files beginning with sol2_aux.

ISAT uses 'proxy models' of the actual models used in miniSim. These are 2d or image representations.

Placing objects in a scenario within ISAT results in those models being created in the miniSim simulation, provided the model configuration is complete/correct.

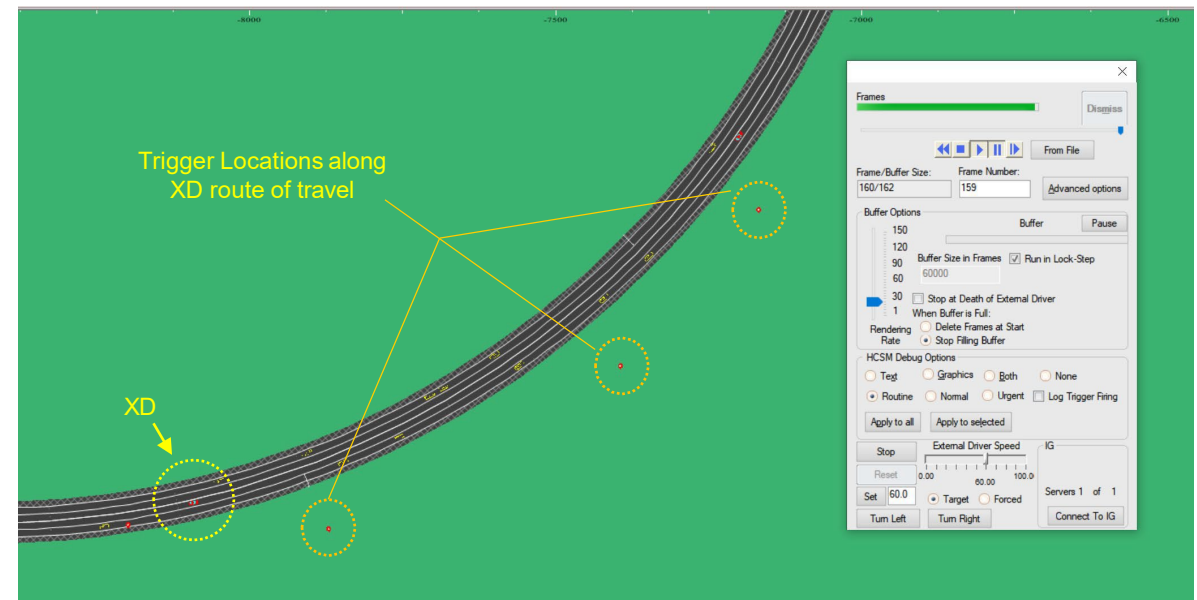miniSim™

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Rehearsal Mode

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Rehearsal mode provides a way to exercise a scenario before driving it on the miniSim. It is often used as a way to test general timing or confirm triggers are executing as planned.

Rehearsal is **NOT** a substitute for test driving a scenario on miniSim.

Scenario authoring is a highly iterative process and the best way to approach it is to test every step of development where appropriate.

It's probably not practical (or efficient) to drive a scenario after every change – but rehearsal is a quick and efficient way to check your work!
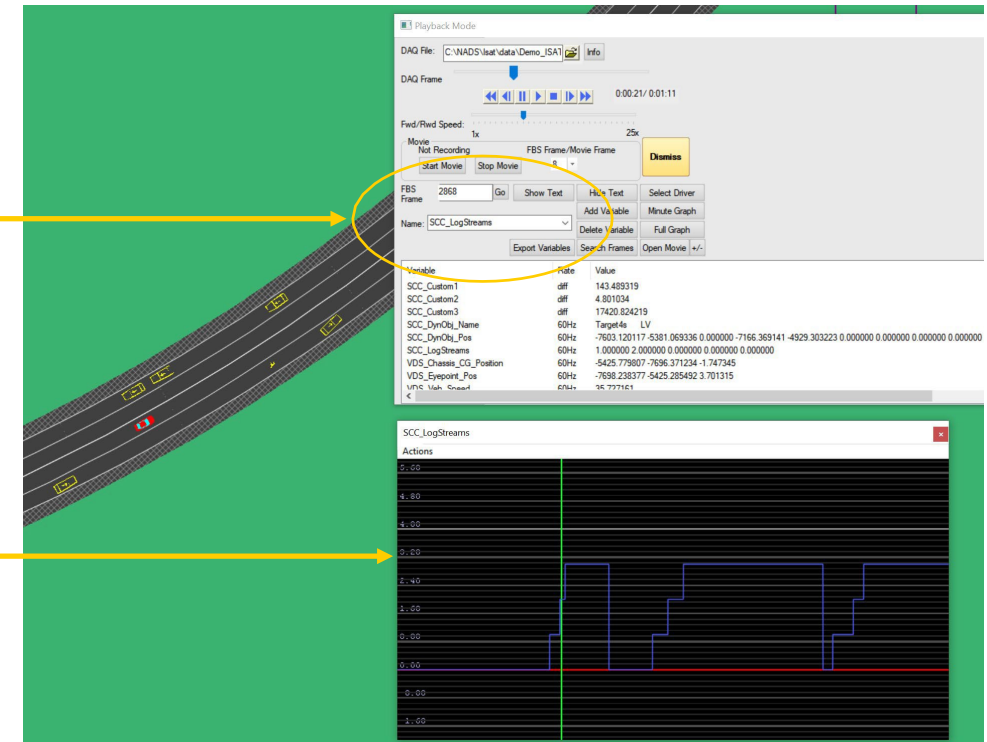
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DAQ review of a miniSim drive can be used during development to ensure scenario elements are working as intended. Problems can be isolated, identified, corrected and verified before releasing the scenario for use in data collection with human participants.

Variable from drive

Variable plot from drive

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Additional Resources

Additional ISAT and scenario resources are available at:

[The ISAT User Guide on the miniSim support site](#)

at:

https://www.nads-sc.uiowa.edu/minisim/wiki/index.php?title=ISAT_User_Guide_Table_of_Contents