Contribution Title*

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Abstract. The abstract should briefly summarize the contents of the paper in 150–250 words.

Keywords: First keyword · Second keyword · Another keyword.

1 Introduction

2 Related Work

2.1 Pedestrian Navigation and Traffic Safety Tasks

2.2 Scenario Description Languages and Task Specification

2.3 Human-in-the-Loop Simulation and Virtual Reality

2.4 Large Language Models for Structured Scenario Generation

3 Method

3.1 Pedestrian Navigation Task Taxonomy

Scope and Inclusion Criteria This work targets the generation of pedestrian navigation scenarios for human-controlled users in XR-based simulation. The pedestrian itself is not behaviorally simulated; instead, the scenario specifies navigation objectives, constraints, triggers, and evaluation conditions, while execution and decision-making are performed by the user.

We define a pedestrian navigation task as an atomic interaction unit that satisfies the following criteria:

– **Intentionality**: the task encodes a clear navigation objective or decision the user must perform.

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- **Environmental grounding**: the task is defined with respect to explicit spatial, traffic, or semantic elements of the environment.
- **Evaluability**: the task admits objective success and failure conditions observable by the simulator.
- **Composability**: the task can be combined sequentially or hierarchically with other tasks to form longer scenarios.
- **Scenario expressibility**: the task can be represented declaratively using OpenSCENARIO-style constructs (e.g., goals, constraints, triggers).

Tasks that differ only in low-level motion execution are excluded, as locomotion is performed by the user and not modeled by the system.

Task Taxonomy Table 1 summarizes the resulting pedestrian navigation task taxonomy, including task definitions and corresponding success and failure conditions.

4 Implementation

5 Evaluation

6 Conclusion

Acknowledgements

References

Task	**Description**	**Example Scenario**	**Success / Failure**
Point-to-point	Reach a target location via walkable areas	Walk from building entrance to bus stop	Arrive within tolerance / enter restricted area
Crosswalk-based	Cross a road using a designated crosswalk	Cross a two-lane street at a marked crosswalk	Stay within crosswalk / leave crosswalk
Multi-step routes	Complete ordered sequence of sub-goals	Sidewalk → crosswalk → bus stop	All steps in order / skipped or reordered step
Traffic-aware crossing	Cross only when a safe traffic gap exists	Wait for vehicles to pass before crossing	Gap above threshold / unsafe gap
Constrained path navigation	Navigate using permitted paths only	Follow sidewalk around a fenced area	Compliant arrival / forbidden shortcut
Environmental constrained	Avoid static or semantic obstacles	Navigate around construction barriers	No restricted-zone entry / collision or violation
Triggered navigation	Begin movement after an event trigger	Start walking when pedestrian light turns green	Move after trigger / premature movement
Tolerance-based navigation	Reach target with positional precision	Stand at a bus stop marker	Within tolerance region / outside bounds
Dynamic navigation	Adapt path due to dynamic obstacles	Re-route when another pedestrian blocks the path	Successful adaptation / deadlock
Speed adaptation	Adapt walking speed to context	Slow down because of a slower entity in front	Speed within limits / speed violation

Table 1. Pedestrian navigation task taxonomy with representative example scenarios and evaluation criteria.