

CrashSimGen: Generating Critical Scenarios with Diffusion Models for self-Driving

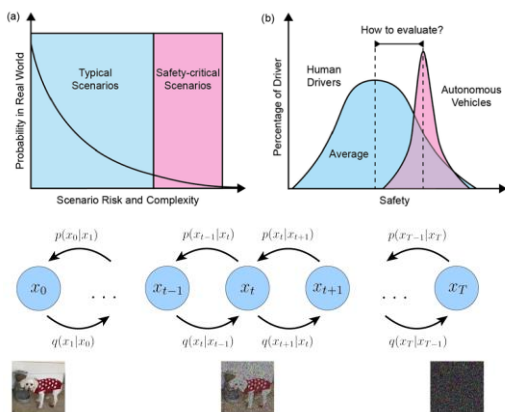
Introduction

Critical Scenario

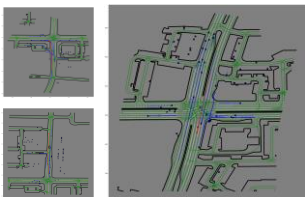
NHTSA37

Diffusion Model

DDPM



Dataset and Features

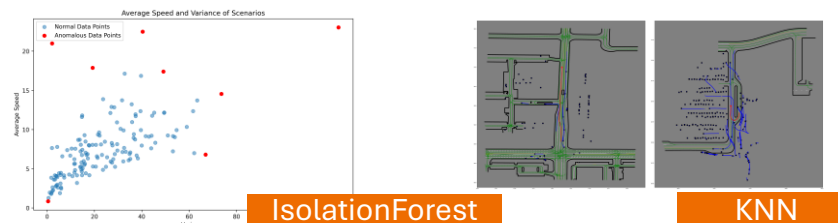


Waymo Motion	Parameters
Recorded Data length	574 hours
Data Size	About 860 GB
10Hz Segments	103,354
Scenarios/Frames	Over 200,000 / Over 2000 millions

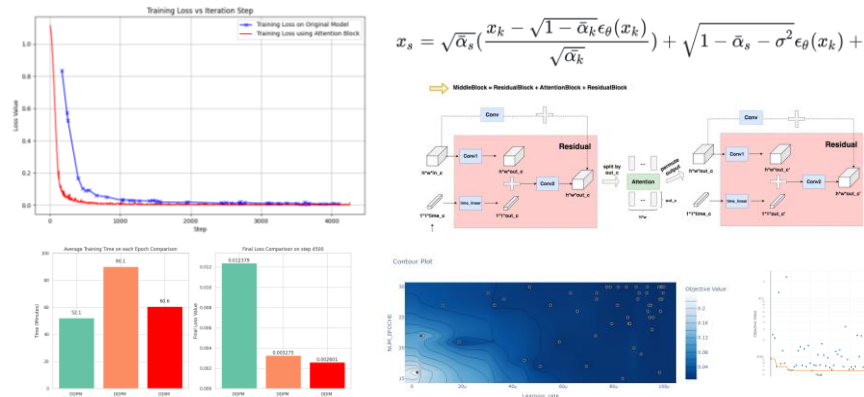
Current Solution & Baseline

Current Related Works	Use Diffusion Model?	Sampling on Biggest Dataset?	Critical Scenario?	CARLA Simulation and Validation?
WCDT (CVPR 2024)	✓	✓	✗	✗
DriveSceneGen (RA-L 2024)	✓	✓	✗	✗
ChatScene (CVPR 2024)	✗	✗	✓	✓
Scenario Diffusion (NeurIPS 2023)	✓	✗	✗	✗
DiffScene	✓	✗	✓	✗
CTG (ICRA 2023)	✓	✗	✗	✗
CrashSceneGen (Our Work)	✓	✓	✓	✓

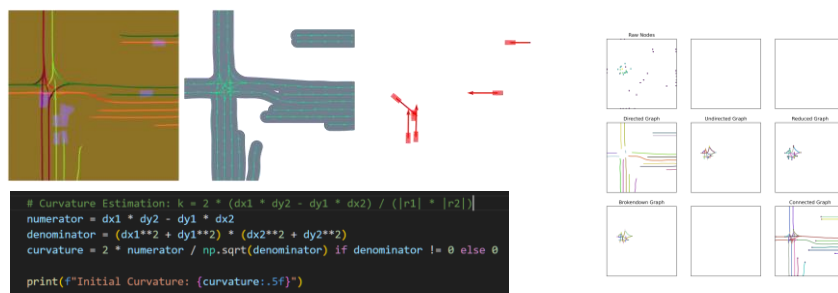
Critical Scenarios Selection



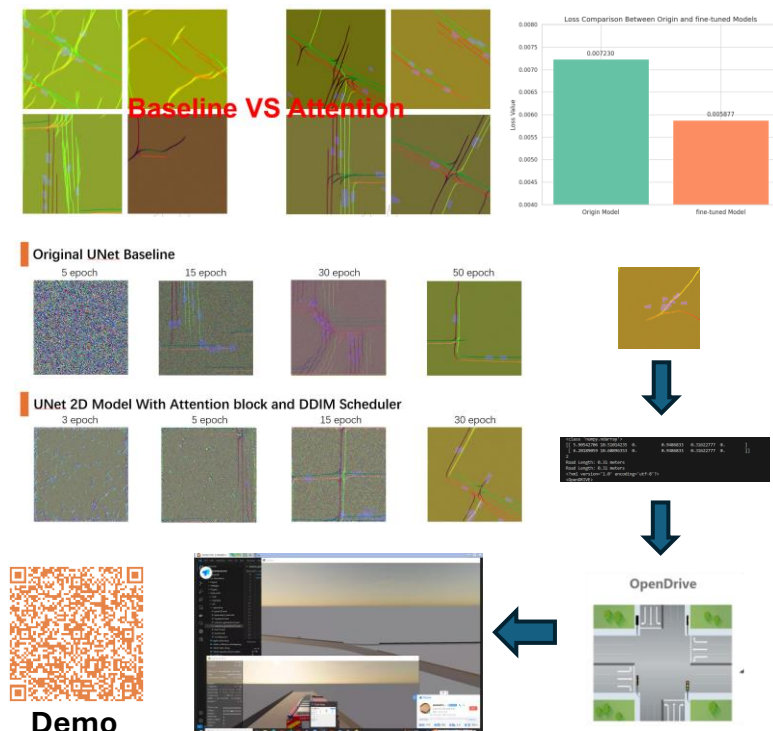
Attention Based Diffusion Model with DDIM



CARLA End-to-end parser



Experiment



Conclusion & Future Works

