

## Open Source Software References

### DreamerV3

- Research Paper: Hafner, Danijar, et al. “Mastering Diverse Domains through World Models.” *arXiv.Org*, 17 Apr. 2024, [arxiv.org/abs/2301.04104](https://arxiv.org/abs/2301.04104).
- Description: Cutting-edge world model-based reinforcement learning algorithm used for training agents in diverse and complex environments through latent imagination and long-horizon planning

### PyTorch DreamerV3

- Code Repository: <https://github.com/NM512/dreamerv3-torch>
- Description: A PyTorch-based open-source implementation of DreamerV3, which served as the foundation for training and adapting our autonomous racing agent.

### ROS 2 (Robot Operating System)

- Website: <https://docs.ros.org/en/foxy/>
- Description: Used as the core middleware to manage communication between perception, planning, and control modules

### NVIDIA Isaac Lab

- Website: <https://developer.nvidia.com/isaac/lab>
- Code Repository: <https://github.com/isaac-sim/IsaacLab>
- Description: Modular reinforcement learning framework for robotic simulation and training in Isaac Sim that we adapted to fit the dynamics and sensing models of our vehicle

### Racing DreamerV1

- Research Paper: Brunnbauer, Axel, et al. “Latent Imagination Facilitates Zero-Shot Transfer in Autonomous Racing.” *arXiv.Org*, 28 Feb. 2022, [arxiv.org/abs/2103.04909](https://arxiv.org/abs/2103.04909).
- Code Repository: [https://github.com/axelbr/racecar\\_gym](https://github.com/axelbr/racecar_gym)
- Description: Used to help us format and project and see previous work

### Racecar Gym

- Code Repository: [https://github.com/axelbr/racecar\\_gym](https://github.com/axelbr/racecar_gym)
- Description: A prior application of DreamerV1 in the racing domain that helped guide our project structure and provided valuable insights into using world models for sim-to-real transfer

### Gymnasium / OpenAI Gym

- Code Repository: <https://github.com/Farama-Foundation/Gymnasium>
- Description: Standardized interface for reinforcement learning environments

### PyTorch

- Website: <https://pytorch.org>
- Description: Machine learning framework used to build and train our reinforcement learning models